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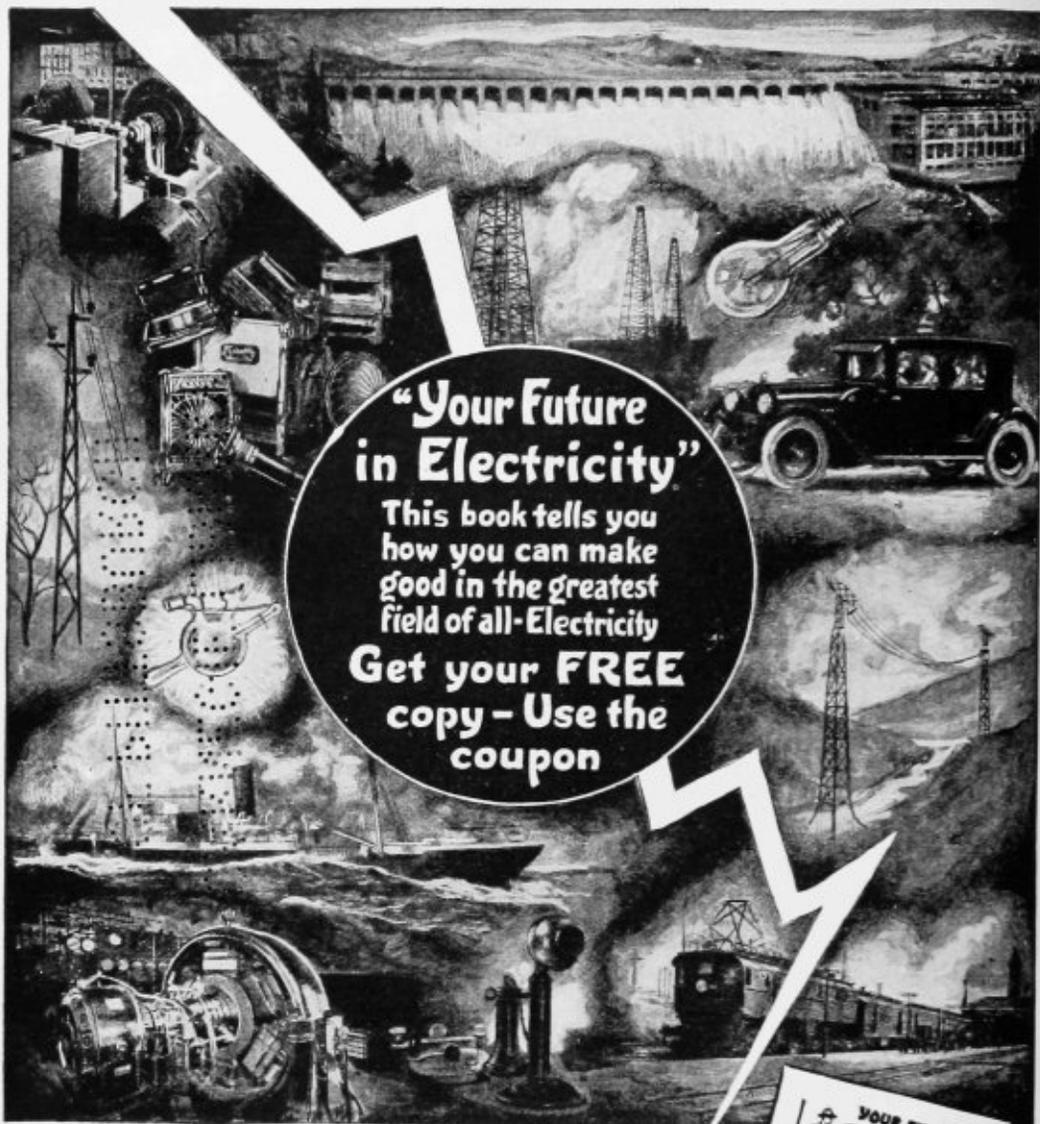
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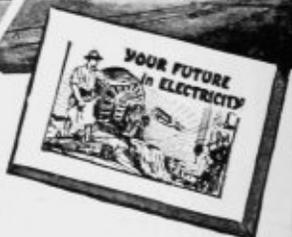
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VOL. XXXIX

MARCH, 1923

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Advertising Office:
Peoples Gas Building, Chicago

Publication Office:
Drexel Avenue and 58th St., Chicago, Illinois

Eastern Advertising Office:
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Dear Reader:

Imagine being in a country where the jungles are so dense that you would not see the sun for nine months at a stretch—with no other companions than peacocks, pirates, pythons, elephants, tigers and wild people who live on lizards, snakes, rats and roots! Imagine after having a steady diet of chicken three times a day, for several years, you came upon a deer, which you could put in your pocket! These are only two of the many unique experiences of G. Carveth Wells, F.R.G.S., who travelled through the Malaysia peninsula in search of a possible missing link. He succeeded in photographing a Jungle Dwarf—a feat as easy of achievement as that of catching a moonbeam. Mr. Well's article on this subject in the April issue is replete with thrills, as well as interesting information.

Another striking feature in the April issue is Mark H. Revell's article, "Analyzing Your Child's Future," describing what science is doing to take the vital matter of child-training out of the realm of guesswork. William Fleming French presents an intimate glimpse into journalism in an article, "Do You Want to Write?" which points out to those who aspire to become writers just what to expect.

William Hodge, author and famed theatrical star, has a strikingly unusual message of success that will grip your interest, whether you agree with him or not.

Have the rigors of winter dulled the gloss of your car? The April issue contains a practical article on how to revarnish it and restore its original brilliance. A second article gives a list of pointers on how to get greater mileage from your tires.

Don't overlook the Household and Boys' departments. They contain many attractive items.

As a matter of fact, in the splendid group of articles in the April issue you will find something of interest to every member of the family.

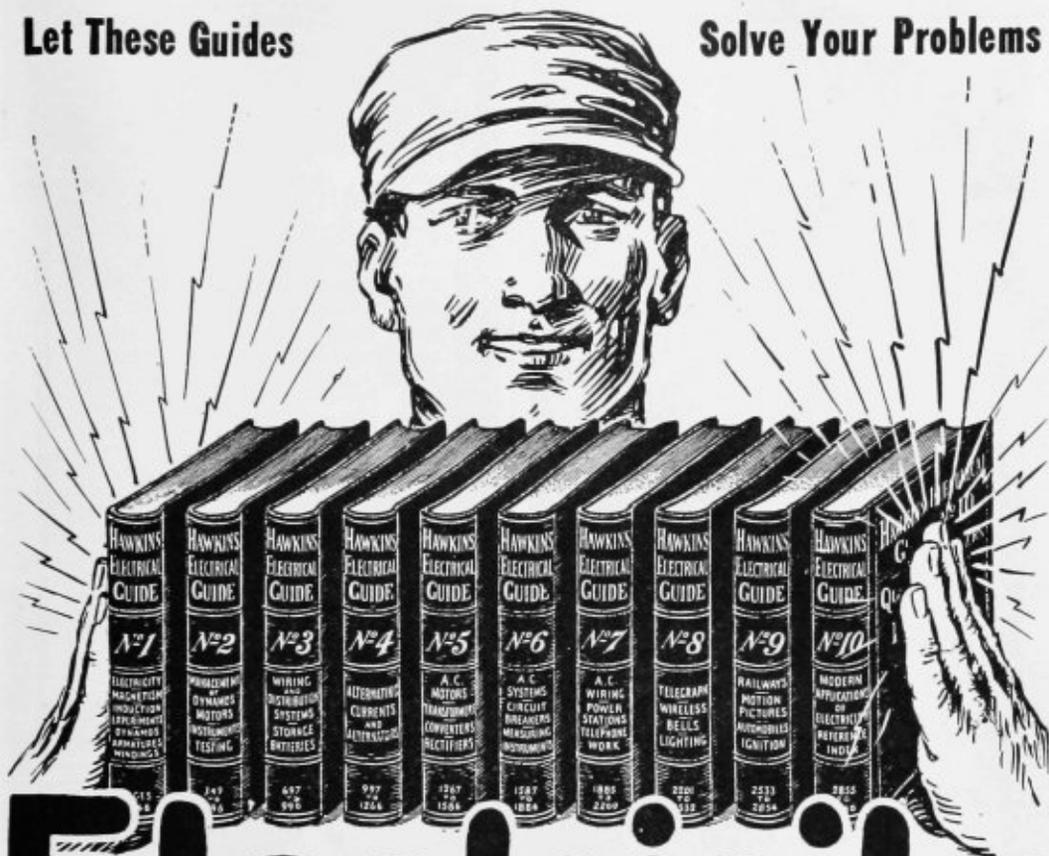
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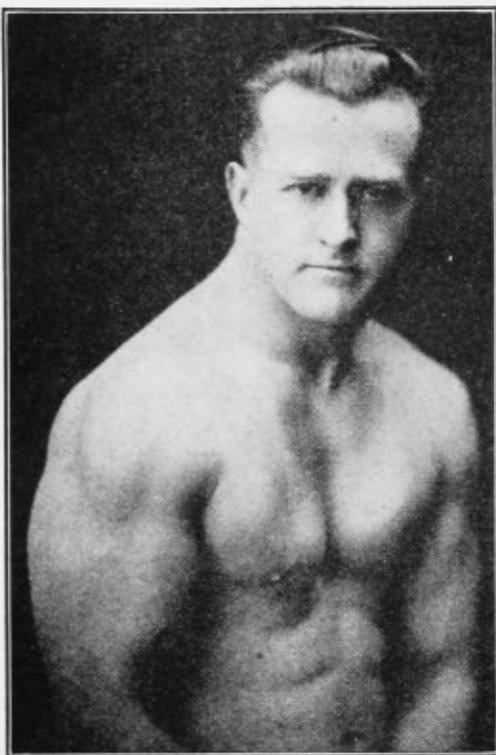
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Ill. World, Jan. '23



EARLE E. LIEDERMAN

If a Snake Had Brains—

He would still be a snake. With his present body he would be forced to continue crawling on his belly. So he would be no better off.

Of What Use Is Your Brain?

A snake is the lowest and meanest of animal life, while mankind is the highest. Do you make use of your advantages? Your brain is used to direct your body. If you don't keep the body in fit condition to do its work, you are doomed for failure. How are you using this wonderful structure? Do you neglect it or improve it?

Examine Yourself

A healthy body is a strong, robust one. Do you arise in the morning full of pep and ambition to get started on the day's work? Do you have the deep, full chest, the big, mighty arms and the broad back of a REAL HE MAN? Do you have the spring to your step and the bright flash to your eye that means you are bubbling over with vitality? If not you are slipping backward. **Awake!** Get hold of yourself and make yourself THE MAN YOU WERE MEANT TO BE.

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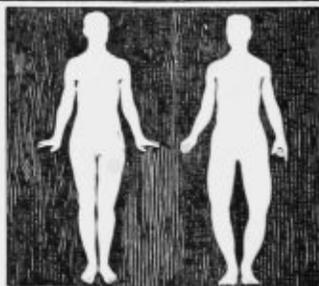
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LIONEL STRONGFORT
The Perfect Man
to you in friendship.

The man who marries a pure, innocent, trusting girl before he is physically fit and a real man in the truest sense of the word commits the worst crime known to civilization.

—LIONEL STRONGFORT.

The Curse of Neglected Health

The divorce courts daily record the domestic disasters that wreck homes and blast the happiness of husbands, wives and children. If you are not physically and mentally fit, your wedded life will be a ghastly failure—you will wreck your wife's and your own life—and you may bring into the world sickly, defective children who will be a burden and reproach to you as long as you live. **THINK NOW** before it is too late.

Make Yourself Fit Before You Marry

It is a crime to marry when you know that you are not physically fit. That pure girl is blinded by her love for you and does not realize your deficiencies. She thinks you are a prince among men, the ideal of vigorous manhood. She pictures you as her husband and father of her children. You know that you are not fit—your state is marred in your present physical condition. The future looks dark and gloomy to you. But **CHEER UP**—my hand is held out. I want to help you. I can help you with

STRONGFORTISM

The Modern Science of Health Promotion

Strongfortism has lifted thousands of weak, ailing, impotent, discouraged men out of the bog of hopelessness and despair and placed them on the straight Road to Health, Happiness and Prosperity. Strongfortism has aided Nature in overcoming such ailments as Catarrh, Constipation, Indigestion, Lipothymy, Nervousness, Bad Blood, Poor Memory, Vital Depletion, Impotency, Youthful Palsy, etc., and the results of neglecting and abusing the body. Strongfortism has restored the Manhood they thought lost forever and has given them renewed confidence, vitality, ambition, success and fitted them for the responsibilities of Marriage and Parenthood. I can do the same for you, irrespective of your age, occupation or surroundings. I guarantee it.

MY METHODS RESTORE MEN

Do not confuse the Science of Strongfortism with gymnastic or ordinary physical culture courses. I am not merely a muscle developer. I am far more than that. For I have devised a system, without the use of dope and drugs, lifting and stretching machines, unnatural deep-breathing—starvation diets or nerve racking routines, or other foolish fads and fancies, but have developed a real Science through which sick, ailing, hopeless, impotent men are restored to the Glory of Powerful Manhood—to the Summit of Health, Strength, Happiness and Success.

SEND FOR MY FREE BOOK

The experiences and research of a lifetime are contained in my wonderfully instructive book, "Promotion and Conservation of Health, Strength and Mental Energy." It will tell you (and show you) how you can make yourself over into a vigorous specimen of Vital Manhood. It will show you how you can fit yourself to be a father and be a credit to your wife and family. It is absolutely free. Just check the subjects on the free consultation coupon on which you want information. Confidential information sent to me with a ten cent piece (one dime) to help pay postage, etc. I will do the rest. Send for my free book **Right Now—TODAY.**

LIONEL STRONGFORT

Physical and Health Specialist

Dept. 203 Founded 1895 Newark, N. J.

FREE CONSULTATION COUPON

MR. LIONEL STRONGFORT, Dept. 203, Newark, N. J.
Please send me your book, "PROMOTION AND CONSERVATION OF HEALTH, STRENGTH AND MENTAL ENERGY," for reading and enclose a ten cent piece (one dime). I have marked (X) before the subject in which I am interested.

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| <input type="checkbox"/> Hay Fever | <input type="checkbox"/> Short Wind | <input type="checkbox"/> Impotency |
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Name

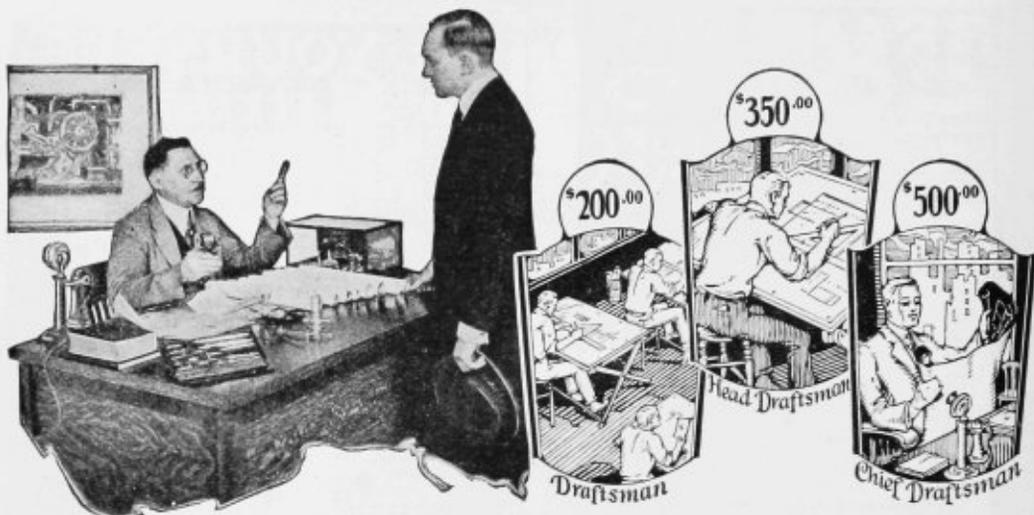
Age

Occupation

Street

CITY

State



I Guarantee to Train You Until You Are in a Position Paying \$200⁰⁰ to \$350⁰⁰ per Month!

DRAFTSMEN are always in demand. Industrial and building activity is steadily increasing the demand. Compare this with some lines where you have to look weeks and weeks for a job.

I have trained thousands of men to be draftsmen — men who had poorly paid jobs, long hours and hard work. Most of these men had just a grammar school training. They are now earning big salaries and have pleasant work. You, too, can be a draftsman and when you have learned you will get a good, permanent position at a good salary. I am called upon constantly by big companies in many lines of business to supply them with men I have trained, *for my men have practical experience when they start on their first job.*

Learn Quickly—Earn While You Learn

You will really enjoy my course. You will find it as enjoyable as playing pool or baseball or football. It is real fun. You can learn drafting in your spare time—keep your present position while taking my course.

Chief Draftsman Dobe Will Train You Personally

I teach drafting entirely different from the method used by correspondence schools. I give you individual lessons. I do not give you unnecessary work, but I do give you the practice you need to start in a good, paying position and make good. Remember, I train you until you are in a permanent position earning \$200.00 to \$350.00 per month. I know what you need, for I too started at the very bottom.



Chief Draftsman, Engineers' Equipment Co.
1951 Lawrence Ave., Div. 1383, Chicago, Ill.

Without any obligation whatsoever, please mail your book, "Successful Draftsmanship"; also send full particulars regarding your FREE COURSE OFFER.

Name

Address

Age

A Draftsman's Pocket Rule sent FREE to all sending this coupon.

Read These Extracts from Letters— Received from Some of My Men

"There are five of your past students here employed as draftsmen; my salary was raised last week to \$350.00 per year."

J. E. RAYMOND

"After finishing your course I was employed by the New York State Railway Company and later became foreman of the drafting department."

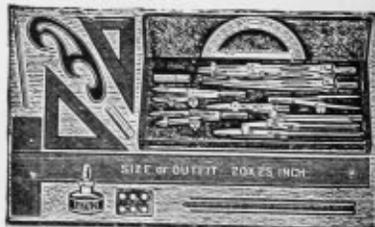
H. C. ANDREWS

"I want to let you know that I have made good due to your training."

L. C. BARRETT

FREE — This \$25.00 Draftsman's Outfit

Not only do I furnish individual instruction, but I give every student a practical, high grade, \$25.00 Outfit FREE.



Special Free Course Offer!

I have a plan whereby you can get an \$80.00 drafting course absolutely free—send for it.

Mail this Coupon Now for Drafting Book and Free Course Plan

If you delay you are putting off the time you start making big money. Don't put off till tomorrow what you can do today. Send the coupon now.

Chief Draftsman, Engineers' Equipment Co.
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ILLUSTRATED WORLD

Vol. XXXIX

MARCH, 1923

No. 1



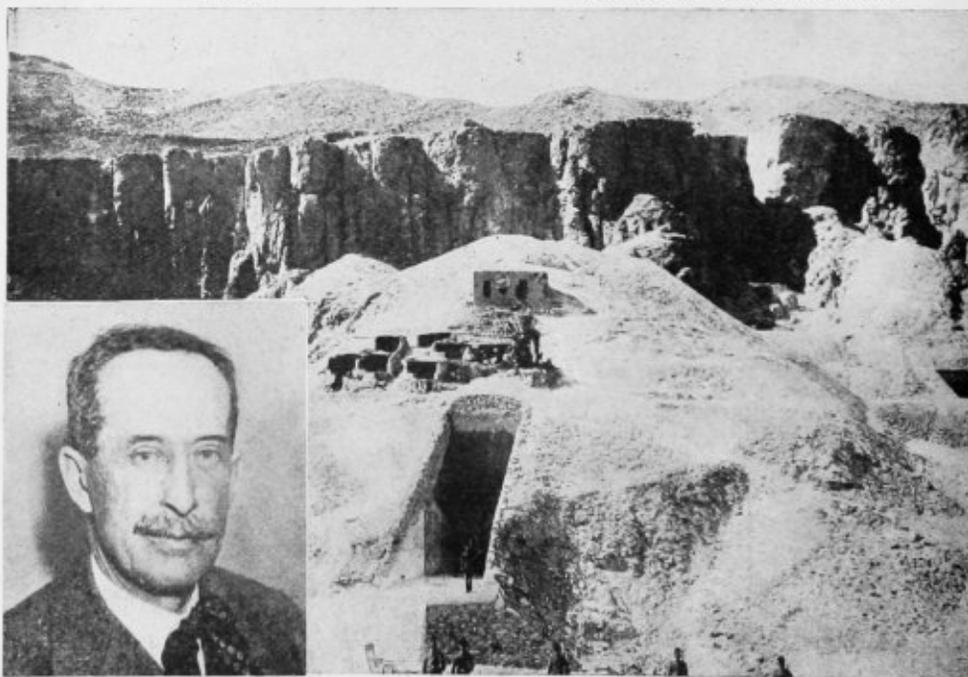
Just Two Young Ones Out for a Good Time



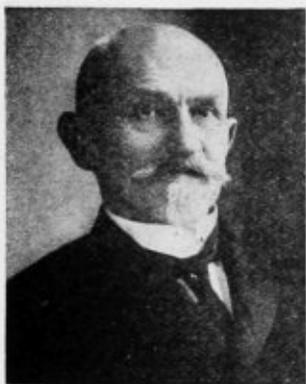
Miss Jane Addams (Left) of Chicago, President of the Conference, and Mrs. Lucy Biddle Lewis, of New York, Vice-President, Were Recently at the Hague to Attend the Women's Peace Conference Organized by the Women's International Freedom League for Peace and Freedom



Colonel Plastiras, Leader of the Greek Revolutionary Committee Which Forced Constantine to Abdicate and Arranged for the Execution of Former Cabinet Ministers, Defended the Action on the Grounds That the Law Provides for Such Executions and the Object of the Revolution Was to Enforce Laws



Lord Carnarvon (Insert) and Howard Carter Have Unearthed Several Valuable Ancient Egyptian Relics, Among Them the Treasure Tombs of King Tutankhamen and Rameses IX. The Excavation in the Foreground Leads to the Chambers Where Treasure Worth More Than \$15,000,000 Has Already Been Found



President Wojciechowski of Poland
Succeeded the Assassinated Gabriel
Narutowicz



Governor Gifford Pinchot, the New Chief Executive of Pennsylvania,
With Mrs. Pinchot, Their Son Gifford, Jr., and the Pet Dogs, "Punch"
and "Bumbo"



Trouble Looms Between France and Germany Because of France Forcibly Taking Control of the Ruhr District.
Photo Shows the First of the French Cavalry Marching Past the Essen Railroad Station on the Way Into
the Town



M. Emile Coue, of Nancy, France, Is in the United States to Give the People His Message About Auto-Suggestion and "Day by Day, In Every Way"

PHOTO ON THIS PAGE © UNDERWOOD & UNDERWOOD



Gustav Hottingen, President of the Northwestern Terra Cotta Company, the Largest of Its Kind in the World, With Assets of Over Four Million Dollars, Has Announced That He Will Turn Over the Company to Employees



For the First Time Since the Days of Abraham Lincoln, a Delegation of Pueblo Indians Recently Went to Washington From New Mexico to Plead With Congress Against Passing the Bill Which Would Take Their Land Away From Them. They Carried the Canes Which They Say Were Given Them By Lincoln As a Token of His Promise of Their Permanent Retention of Their Territory.



© CLARENCE

Mrs. Raymond Robbins, of Chicago and New York, President of the Federation of Working Women (International), Was One of the Prominent Speakers at the Recent Women's Industrial Conference



© UNDERWOOD & LINDENBACH

Miss Lucile Atcherson, of Columbus, Ohio, Is the First Woman to Be Named for an Important Post in the U. S. Diplomatic Service



Fifteen Years Ago Misses Minna and Henrietta Reiff, of St. Paul, Minnesota, Had a Spacious Home and They Didn't Know What To Do With It. So They Started in Adopting Girls. Now They Have an Extraordinary Harmonious Family of Nine Girls Gathered From Many Nations. In the Top Row, Left to Right They Are Emam and Muriel, from Scotland; Dorothea, from Germany, and Aby, from Scotland. In the Bottom Row Are Ernesta, from Bohemia; Margaret from France; Miss Henrietta Reiff; Amelia, from Canada; Miss Mina Reiff, Elizabeth from France, and Martha, from Finland



Dr. Adolf Lorenz Treating a Victim of Infantile Paralysis. The Famous Viennese Surgeon Recently Held a Public Clinic in New York, His First in Over a Year, and Aided Over Fifty Paralytics. He Bitterly Assailed Coue and His "Day-By-Day" Policy



Mrs. Edith C. Roosevelt, the Widow of Theodore Roosevelt, Was Elected to the Council of the National Civil Service Reform League. Her Election Took Place During the Forty-Second Annual Convention Held Recently in Washington, D. C.



© UNDERWOOD & UNDERWOOD

In the Recent Adirondack Gold Cup Championship Skating Meet, Held By the Endicott-Johnson Legion at Johnson City, New York, Charles Jewtraw, of Lake Placid, New York, the New York State Amateur Skate Speed Champion, Broke the World's Amateur Record for the Three-Quarter Mile Event. He Made the Distance in 2:02 4-5, Knocking 3 2-5 Seconds from the Record Held by William Steinmetz



© 1934 HARRY L. HARRIS

Mother Nature Plus Modern Science Is Responsible for This Pleasing Photograph of a Beautiful Sunset. It Was Taken From an Aero-Marine Flying Boat Over Lake George, a Beauty Spot in the New York Adirondacks



CHILDREN CAN BE IMPROVED LIKE PLANTS—Says LUTHER BURBANK

—by HARRY H. DUNN—

"Life is self expression—a challenge to environment. It is action in certain definite directions, based on mechanical or chemical change. In Nature we find varied animate and inanimate forms of life, many of which have motions—some of which, in the higher forms, we call emotions. These sometimes end in action; at other times in thought.

"By common consent we usually associate Life as commencing with the unit of life—the individual cell—but Life really exists as an organized force in all growing crystals, and, in a review of the fundamentals of Life, we must go even to a more primitive form than that of crystal life; below even these we find, instead of the organized growth seen in crystals, an amorphous life. The first primitive, half-plant, half-animal life forms without doubt commenced self-expression in and near water, as we now find them."—Luther Burbank.

LUTHER BURBANK, leader of the world's plant-evolutionists and plant-breeders, and responsible for the creation of more than one thousand new varieties—some of them new *species*—of fruits, grains, flowers and vegetables, believes, on this, his fiftieth year of work in the vegetable kingdom, that children can be developed, improved and trained, just as he has developed, improved and trained scores of weeds into valuable or beautiful food-producing plants and flowers. He believes, further than this, that only by following the principles of plant-breeding and improvement which he has discovered will America

ever produce the best human product of the international seed-bed of races which she has become.

Mr. Burbank, in the half-century in which he has been working, and in the production of all manner of improved plant life, from the world-known Burbank potato of forty-eight years ago to the artichoke four feet in circumference, or the asparagus as large as a bamboo shoot, his latest productions, has come to the opinion that, just as he eliminates the unfit and worthless parent plants from his breeding stocks and his selection-beds, so should the unfit and the worthless human parent—though usually the

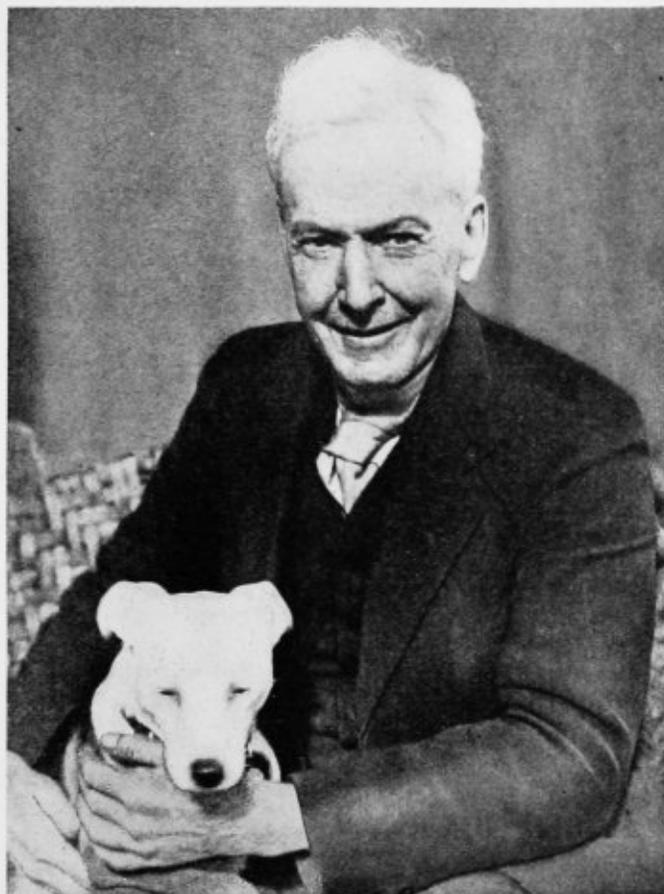
most productive—be prevented from presenting more of his kind to the world. He believes, too, that children of such parents, descendants of such stock, should be developed, trained and improved under the best of human environment, just like his flowers and vegetables and trees are improved and developed in the best of plant environment so that they, in their turn, may give to the world the best they have, rather than the worst.

I saw the 74-year-old plant magician the other day at his home in Santa Rosa, amid the two thousand five hundred experiments in plant breeding now going on on his experimental farm. He talked with me about this belief of his that the human seedling can be trained and the best within it developed, just as the plant seedling can be improved and developed.

"There is not a single desirable attribute which, lacking in a plant, may not be bred into it. Choose what improvement you wish in a flower, a fruit, or a tree, and by crossing, selection, cultivation and persistence, you can fix this desirable trait irrevocably. Pick out any trait you want in your child, granted that he is a normal child, be it honesty, fairness, purity, loveliness, industry, thrift or what not. By surrounding this child with sunshine from the sky and from your own heart, by giving him the closest communion with nature, by feeding him well-balanced, nutritious food, by giving all that is implied in healthful environmental influences and by doing all in love, you can thus cultivate in the child and fix there for all his life, every

one of these traits," says the famed plant evolutionist.

"Naturally, this cannot always be done to the full in all cases at the beginning of the work, for heredity will make itself felt first and, as in the plant under improvement, there will be certain strong tendencies to reversion to former ancestral traits, but, in the main, with the normal child, you can give him all these traits by patiently, persistently guiding him in these early formative years.



Luther Burbank and His Pet Dog. Now in His Seventieth Year, the Plant Wizard Has Been Working on Creations in Plant Life for Fifty Years. During That Time He Has Introduced Over a Thousand New Varieties, Some of Them New Species

"With those who are abnormal, likewise, but even more strongly, the end will not be reached at one step. It will require years, centuries, perhaps, to erect on the foundation we now have in America the human structure which I believe is to be

built in this manner. Here appears a child plainly not normal. What shall we do with him? Shall we, as some have advocated, even from Spartan days, hold that weaklings shall be destroyed? No. In cultivating plant life, while we destroy much that is unfit, we are constantly on the lookout for that which has been called the 'abnormal,' that which springs apart in new lines. How many plants are there in the world today that were not in one sense once abnormalities? No, it is the influence of selection, of cultivation, of surroundings, of environment, that makes the change from the abnormal to the normal.

From the children we are led to call 'abnormal' may come, under wise cultivation and training, splendid normal natures."

As a result of his fifty years of experiments, the wonder-worker of the plant kingdom has developed his own logical ideas of environment and heredity as applying to the human race. Adding together what he knows about plants and what he knows of human life, and drawing his comparative conclusions, he has some striking views about heredity.

"Heredity is simply the sum of all the effects of all the environments of all past generations on the responsive, ever-moving life forces. It is not some hideous ancestral specter forever crossing the path of a human being. There is no doubt that if a child with a vicious temper be placed in an environment of peace and quiet, the temper will change. Put a boy born of gentle, white parents among Indians, and he will grow up an Indian. Let the child born of criminal parents have a setting of morality, integrity and love, and the chances are that he will not

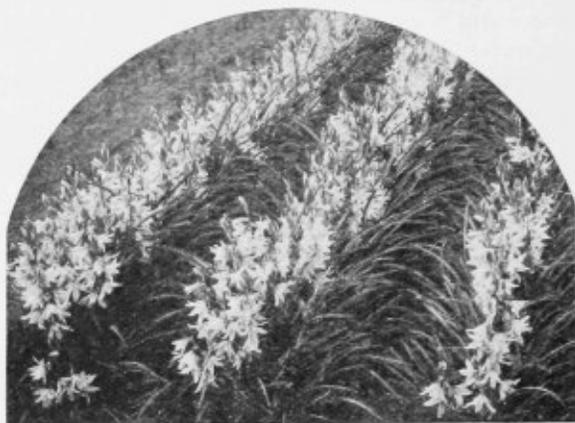
grow into a criminal, but into an upright man— though I do not say, of course, that heredity will not sometimes assert itself. There is no such thing in the world, there never has been such a thing, as a predestined child—predestined for heaven or hell. Even total depravity never existed in a human being, never can exist in

one any more than it can exist in a plant. When the criminal instinct crops out in a person, it might appear as if environment were leveled to the ground, but in succeeding generations the effect of constant higher environment will not fail to become fixed.

"It would, if possible, be best absolutely to prohibit, in every state in the Union, the marriage of the physically, mentally and morally unfit. If we take a plant which we recognize as poisonous, and cross it with another which is not poisonous, and thus make the wholesome plant evil, so that it menaces all who come in contact with it, this is criminal enough. But suppose we blend together two poisonous plants, and make a third even more virulent, a vegetable degenerate, and set their evil descendants adrift to multiply over the earth? Are we not then distinct foes to the race?"

"What then shall we say of two people of absolutely defined physical impairment, who are allowed to marry and rear children? It is a crime against the state and against every individual in the state. And, if these physically degenerate are also morally degenerate, the crime becomes all the more appalling.

"In plant cultivation, under normal conditions, from six to ten generations are generally sufficient to fix the descendants of the parent plants in their new ways. Sufficient time in all cases must



Just As a Little Inspiration to the Much Maligned Onion Family, Burbank Developed the Chive Into a Flowering and Fragrant Plant, But Retained Its Edible Qualities

elapse, so that the descendants will not revert to some former condition of inefficiency. When once stability is secured, usually, as I have indicated, in from six to ten generations, the plant may then be counted upon to go forward in its new life, as though the old lives of its ancestors had never been. This, among plants, will be by the end of five to ten generations, varying according to the plant's character, and its pliability or its stubbornness. I do not say that lack of care and nourishment thereafter will not have a demoralizing influence, for no power can prevent a plant from becoming again part wild if left to itself through many generations, but even in such an instance, it probably will become wild along the lines of its new life, not by any means necessarily along ancestral lines.

"Ten generations of human life should be ample to fix any desired attribute. This is absolutely clear; there is neither theory nor speculation. Given the fact that the most sensitive material in the world upon which to work is the nature of a little child; given ideal conditions under which to work upon this nature, and the end desired will come just as certainly as it comes in the cultivation of the plant. There will be this difference: It will be immeasurably easier to produce and fix any desired traits in the child than in the plant, though, of course, a plant may be said to be a harp of but few strings, as compared with a child.

"Meanwhile, I give full weight to the personal element, the sovereign will of the human being, and its power of determining for itself. But the most stubborn and willful nature in the world is not that of the child. I have dealt with millions of plants; have worked with them for many years; have studied them with the deepest interest from all sides of

their lives. The most stubborn living thing in this world, the most difficult to swerve, is a plant once fixed in certain habits—habits which have been intensified and which have been growing stronger and stronger upon it by repetition through thousands and thousands of years. Remember that this plant has preserved its individuality all through the ages; perhaps it is one which can be traced backward through eons of time in the very rocks themselves, never having varied to any great extent.

"Do you suppose, after all these ages of repetition, the plant does not become possessed of a will, if you so choose to call it, of unparalleled tenacity? Indeed, there are plants, like certain of the palms, so persistent that no human power has been able to change them. The human will is a weak thing beside the will of a plant. But see how this whole plant's lifelong stubbornness is broken simply by blending a new life with it—making, by crossing, a complete and powerful change in its life. Then, when the break comes, fix it by these generations of patient supervision and selection, and the new plant sets out upon its new way never again to return to the old, its tenacious will broken and changed at last. When it comes to so pliable a thing as the nature of a child, the problem becomes vastly easier.

"Just as there must be in plant cultivation great patience, unswerving devotion to the truth, the highest motive, absolute honesty, unchanging love, so must it be in the cultivation of the child. If it be worth while to spend ten years upon the ennoblement of a plant, be it fruit, tree or flower, is it not worth while to spend ten years upon a child in this precious formative period, fitting it for the place it is to occupy in the world? Is not a child's life vastly more precious than



His Spineless Cactus Is Well-Known. He Took the Prickers Off the Plant and Made It From a Pest Into What He Considers One of His Most Useful Creations

the life of a plant? If a plant is valuable, more so is a child.

"Under the old order of things, plants kept on in their courses largely uninfluenced in any new direction. The plant-breeder changes their lives to make them better than they ever were before. Here in America, in the midst of this vast crossing of species of mankind, we have an unparalleled opportunity to work upon these sensitive human natures. We may surround them with right influences; we may steady them in right ways of living; we may bring to bear upon them, just as we do upon plants, the influence of light and air, of sunshine, and abundant, well-balanced food; we may give them music and laughter; we may teach them, as we teach the plants, to be sturdy and self-reliant; we may be honest with them, as we are obliged to be honest with plants; we may break up this cruel educational articulation which connects the child in the kindergarten with the graduate of the university, while there goes on from year to year an uninterrupted system of cramming, an uninterrupted mental strain upon the child, until the integrity of its nervous system may be destroyed, and its life impaired.

"Even in that mysterious pre-natal period should we begin our work, throwing around the mothers of the race every possible loving, helpful and ennobling influence, for in the doubly-sacred time before the birth of a child lies—far more than we can possibly know—the hope of the future of this ideal race which is coming upon this earth if we and our descendants will it to be so. Man has by no means reached the ultimate. The fittest has not yet arrived. In the process of elimination the weaker must fail, but the battle has changed its base from brute force to mental integrity. The man of the future ages will prove a somewhat different order of being from that of the present. He may look upon us as we today look upon our ancestors. The transcendent qualities which are placed in plants will have their analogies in the noble composite, the future American.

Mr. Burbank has firmly fixed ideas of what does and does not constitute the proper kind of education for our youth. "Any form of education," he said, "which

leaves one less able to meet everyday emergencies and occurrences is unbalanced and vicious, and will lead any people to destruction. Every child should have mud pies, grasshoppers, water-bugs, tadpoles, frogs, mud turtles, elderberries, wild strawberries, acorns, chestnuts, trees to climb, brooks to wade in, water lilies, woodchucks, bats, bees, butterflies, various animals to pet, hayfields, pine cones, rocks to roll, sand, snakes, huckleberries and hornets; and any child who has been deprived of these has been deprived of the best part of his education. For, by being well acquainted with all these, the child comes into most intimate harmony with nature, whose lessons are, of course, natural and wholesome. A fragrant beehive and a plump, healthy, hornet's nest in good running order often become object lessons of some importance. The inhabitants of either can give the child pointed lessons in punctuation, as well as in caution, and some of the limitations, as well as the grand possibilities of life. By each new experience with homely, natural objects, the child learns self-respect, and also to respect the objects and forces which he must meet in life."

The plant-magician is a firm believer in evolution and in the survival of the fittest. His great work with plants began about the time when the doctrine of evolution began to reach the man on the streets, and his first discoveries in the results of plant selection, cultivation, cross-fertilization, breeding and development, showed *new species*, produced from definite and well known species of plants. His was a definite demonstration of evolution, assisted by the hand of man. As he said to me:

"Here were illustrations of what appeared to be new species of plants, and these apparently new species were of *known origin*. They had been developed under the hand of the experimenter through the hybridization of old species, followed by *scientific selection* of a character having obvious affinity with the operation of *natural selection* on plants in the state of nature. The tangible fact that *widely divergent forms of plant life might spring from the same source* was made clear beyond any misunderstanding.



Luther Burbank and Mrs. Burbank Standing Before a Tree Which Formerly Belonged to a Non-Blossoming Variety. "But It Has Beautiful, Fragrant Blossoms Now As a Result of My Work With Its Parents. Just So the Child Can Be Developed"

This constituted in the minds of many laymen, as well as in the minds of scientists, a clearer and more cogent argument for the truth of the doctrine of evolution than could have been found in any amount of theorizing.

"In a word, a single case, like that of hybrid blackberry-raspberry, called the "Primus," seems by itself to establish fairly the doctrine that new species of plants may arise by the combination of old species. The survival of the fittest had been explained as an essential part of the Darwinian theory. The origin of the fittest—or at least one possible origin—appears to be explained by the coming into being of such a hybrid as this. The parents of the Primus were the California dewberry and the Siberian raspberry. These forms are so different in appearance that no botanist ever would think of denying that they belong to totally different species.

"Yet here at Santa Rosa these diverse forms were combined and a new fruit produced, differing very markedly from either parent although retaining some of the characteristics of each. Further, this new hybrid, far from being sterile, has such fertility that it ripens its main crop

of berries long before most kinds of raspberries and blackberries even commence to bloom, and continues to bear more or less berries all summer. So the evidence that hybrid offspring of two species may be fertile and may thus offer material for the action of natural selection in the creation of new species appears doubly proved in this instance.

"The mental and moral attributes of man may be likened to the flower or fruit of the cultivated plant in that they are the qualities most recently developed or transformed through selective breeding. In token of their newness, they are the qualities which are most easily altered or modified by environing influences or by new racial blendings. Even the deep-seated and fundamental qualities may be profoundly modified if the environing influences are applied during the childhood of either the seedling plant or the human subject.

"Unless a way can be found to make the average environment of successive generations of human beings better and better—instead of allowing it to become worse and worse—we cannot hope that the generations of our grandchildren will maintain the average standards of our own time, much less improve upon them."

CARTOONIST VIEWPOINTS



WELL, SO FAR
NOTHING HAS HURT US

IRELAND in the COLUMBUS DISPATCH



TO GET BLOOD FROM A TURNIP!

BREWSTER in the ATLANTA JOURNAL



THE SHADOW IN THE EAST!

THIELE in the SIOUX CITY TRIBUNE



AS WE UNDERSTAND IT THIS ISN'T EXACTLY
WHAT THE HOSTESS PLANNED THE PARTY FOR

DARLING in the DES MOINES REGISTER



"READY FOR ANOTHER MATCH, MISTER?"

CCP in the DAVENPORT DEMOCRAT

OF THE WORLD'S DOINGS



IT'S A BIG TEMPTATION, ANYHOW.
DAREDEVIL in the GRAND RAPIDS PRESS



WHY PICK ON US?
COLUMBUS JOURNAL



WE MOVE THE NAME BE CHANGED TO MARION, D. C.
THREE in the SIOUX CITY TRIBUNE



DOESN'T SEEM TO BE GETTING HER STUFF ACROSS
REID in the MILWAUKEE SENTINEL



ITS A "FUNNY" WORLD
MONTGOMERY ALA., ADVERTISER



One of the Forests Located About Six Miles from Adamana, Arizona, Is Noted for Its Bright Colors

A GREAT FOREST GONE TO SLEEP

The Mysterious Stone Trees of the Southwest Are Still a Puzzle to Science

by GEORGE W. EARLY

THE petrified forest is the most puzzling of all the southwest Wonderland of America, considered the world's most concentrated area of natural wonders. One guess may be as good as another. The greatest geologists, the greatest botanists have bumped their heads against these stone trees in vain and have given us no answer. John Muir, "Brother of the Trees," could not solve the riddle. And so these trees remain the hardest nut, and the hardest wood, in the world—the prime mystery of geology.

These vast logs are not huddled nor crisscrossed, as of a freshet or a log-jam, but fallen orderly where they grew, some half a mile or so lower, with the under waste of the earth-tissues that gave them root. Conceive a woodland beside which the tallest of Maine or Tennessee would be underbrush—mostly conifers, but with some willows, cottonwoods or other equivalent deciduous trees. This forest comes to prime—at least, we have trees of it which stood two hundred forty

feet in height, measured "for keeps" in eternal stone.

As the Grand Canyon of Arizona surpasses in extent and grandeur all other canyons in the world, so also the petrified forest transcends in variety of coloring and in extent all other similar deposits in the world.

Silicified wood is found on the east fork of the Yellowstone and on the high plateaus of southern Utah. Small segments of trees (chips of the ancient blocks) are scattered throughout northern Arizona. But, as if laid bare for the delight of tourists and the research of scientists, there are gathered together in Apache County, Arizona, vast deposits of petrified wood, from the size of a toy marble to trees more than two hundred feet in length. The forest covers many thousands of acres, in five separate tracts, all easily accessible from Adamana, the third forest being reached from Holbrook.

The First Forest, noted for its bright

colors, is some six miles from Adamana, and is easily reached in an hour and a half. The chief object of interest is the Natural Log Bridge, which spans a chasm sixty feet wide—a trunk of jasper and agate overhanging a tree-fringed pool. The Eagle's Nest, Snow Lady and Dewey's Cannon are in this same region.

The Second Forest is two and a half miles south of the first one, and contains about two thousand acres, the trees being mostly intact, large, and many of them highly colored. The Twin Sisters are an interesting sight. The Third Forest covers a greater area than the others, the district containing several hundred whole trees, some of them more than two hundred feet long, partly imbedded in the earth. These huge unshattered blocks of agate are magnificent specimens. The colors are very striking, comprising every tint of the rainbow. The local name of "Rainbow Forest" is therefore very appropriate.

Vistors marvel at the polished slabs and huge trunks of agatized trees, not thinking of them as trees turned into stone. At Tiffany's, in New York, may be seen a huge slab of petrified wood which has been subjected to the art of the lapidary. Most persons think of it as polished marble or onyx. Few realize that it is a slice of a giant tree that was one of a prehistoric forest in a section of our own country, two thousand five hundred miles from the great metropolis. How few Americans have ever actually walked in this dead and buried forest that through the uncounted years has been giving up its dead! Wind and rain and whirling sand all have combined to lay bare this treasure house of the past, for such it really is. One may wander for days in aisles that were once cool and green, but today bare, white and hot.

What human interest attaches to every foot of the ground! What race of men knew the living forest? What shock of earth brought low these monarchs, stately pine and giant oak? Were they petrified where they fell, or did they float out on the tide of a forgotten race? A thousand questions press in upon the mind as these relics of the ages are viewed.

It is truly God's Acre, but lacking the shrouds, for the ancient trees live again in adamant and agate of every conceiv-



Although Some Trunks Are Still Left Standing, Most of the Stone Trees Are Flat on the Ground

able color. Approaching the deposits from Adamana or Holbrook, you are quickly attracted by stray bits of petrified wood that glisten like jewels by the roadside. You soon notice larger and larger blocks, then trunks of trees, then complete trees, some more than two hundred feet long, tumbled about or lying just as they were bared by the action of the elements. There seems to be no limit to the deposits—literally thousands of acres and millions of tons.

Let no one expect to find these trees standing upright. They are prone upon the ground, in a vast basin, which was once the bed of an ancient sea. Many of these stone trees are partly covered with earth, but retain their bark, sometimes even the heart, and the cross sections plainly show how old they are. Even so, the scene presents endless variety and charm, not the least of which is the setting of supporting cliffs, often rising one hundred fifty feet in height, and cut up into ravines and sloping mesas, variegated with shale, clay and sandstone—faintly suggesting the Painted Desert—and in that frame of earth may be seen trunks of trees and huge blocks of petrified wood set like garnets.

It is truly marvelous to look upon this vast theater of glistening petrified trees.

On some of the slopes, where they lie tumbled together, it is as if whole quarries of marble and onyx had been dynamited. And so varied and bright are the colors, it is as if rainbows had become entangled and conducted to remain on earth.

Back in the ages, something laid this great forest low; possibly a terrific cyclone, a powerful freshet, or a submergence. We have no data beyond the fact of the recumbent giants. All that is sure is that they fell fair where they stood—and are there a few million years later. They have not drifted or shifted. It was the hundreds of volcanic cones, the mineral springs that still persist show that here was a colossal pickling-plant in the ages past.

Pressure is the first mechanics of preservation, modern and ancient. The pneumatic force used to tuck creosote into every sap-cell of a bullpine sleeper would be a lover's pinch compared to the incalculable squeeze that translated these million cords of trunk from burnable firewood to an adamant which the patient combustion of Time cannot even char.

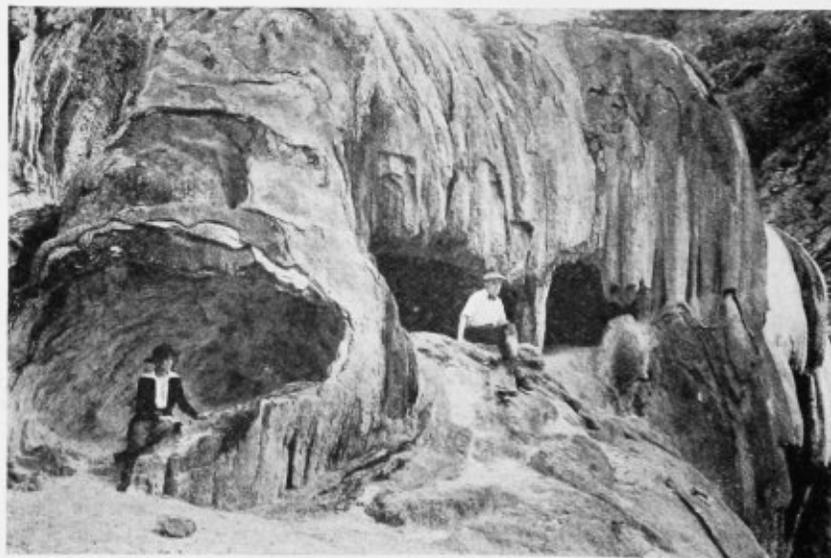
Prostrated in full vigor by some resistless force—not a cyclone, or they would show the tangled windfall; not an avalanche of water or they would be

similarly huddled—these great trees laid them down orderly, their heads generally to the south. There seems to be but one power that we can conceive as sufficiently powerful to so marshal these former giants of the forest aisles—an earthquake of the first dimensions, traveling from the crest of the continent southerly.

It is now a matter of history that these trees went down. They were embalmed to perennial gems after they fell. They are cross-cut and dismembered by later shocks or frosts; then branches shorn and cominuted to litter the ground with kaleidoscopic chips. Even when the full stature of the two hundred-foot tree is measurable upon the ground, it is rare to find twenty feet in a piece. The fracture is an almost perfect cross section; but nothing in human knowledge is more obvious than that these breaks were subsequent to the utter fossilization of the trunks. Anything retaining the merest vestige of ligneous fiber could no more break thus than a live hen could be cracked over your knee to a perfect cross section, including the very halves of the feathers. Equally the matched ends between fractures prove absolute continuity in the process of agatizing.

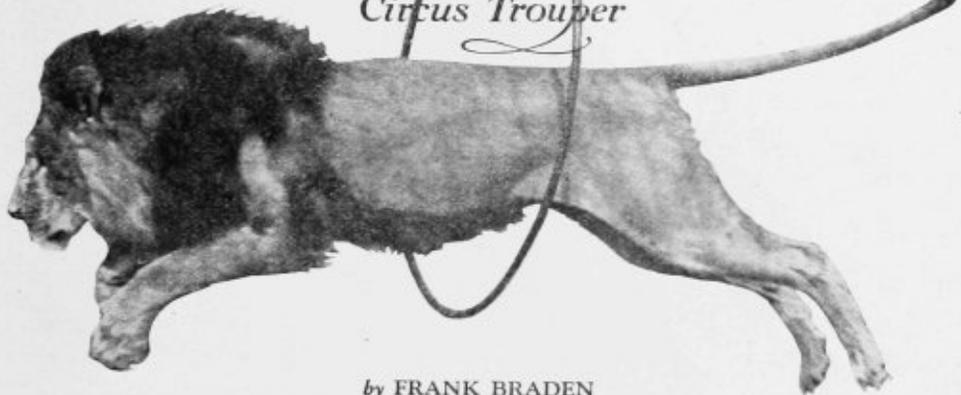
"Somewhere during the stupendous

(Continued on page 135)



One of the Wondrous Beauty Spots Near the Petrified Forests Is the Soda Dam in Jemez Utus Close By Albuquerque

"The Guy Who Said—
TRUTH IS STRANGER THAN FICTION'
Must Have Been an Animal Man," Says a Veteran
Circus Troupier



by FRANK BRADEN

WHAT between magazine writers and press agents there's a lot of fakin' goin' on about elephants and 'cats,' ventured the assistant animal man in the course of the evening chit-chat at winter quarters.

"Not a bit of it!" cut in Emery Stiles, the boss of the circus animals' barns, a veteran troupier. "No matter how much a writer stretches his imagination, he can't begin to measure up to what a 'cat' or an elephant will do now and then. They guy who said 'Truth is stranger than fiction' said a mouthful. He must have been an animal man."

Here, Emery stopped to fill and light his pipe, settled comfortably back in the canvas easy chair that has accompanied him through the last nine big-top seasons, and eyed his assistant challengingly. "Do you remember Herb Maddy's fake about the hippopotamus swimming out to sea from Prince Edward's Island? No. Well, it was a good yarn, and George Moyer gave Herb a raise and a new cane because of it. Herb had the beast chased by a Dominion government hydroplane, which turned it around and herded it back to the circus folk on the beach. Of course, the hippo (It was John Robinson's 'Congo') never left it's tank on the show lot, but the wires hummed with the story all over Canada and the States. It was a fake—yes; but did not Bon, the baby hippo brought over by Otto Floto, beat the story on the square. The circus world will tell you

he did, but the whole world can't because Bon pulled his stunt right near Los Angeles for the movies, and not a newspaper or a wire service would carry a line on it. Why? Bon was unfortunate in his associates. He was mixed up in the movies, and if he had walked right into the city room of any Los Angeles newspaper and told his own story in his own hippo tongue, the city editor would have yawned, 'Another durn movie fake!' and gone right on cussing the display advertising boss for cutting him twelve columns.

"You see, Bon had been rented for a day to take part in an episode of a jungle film, and they needed shots of the hippo charging a little outrigger canoe in which the beautiful heroine sat, her sweetie's head in her lap, while she staunched the wounds made by African tribesmen's spears during the usual escape from the cannibals' village. You know the stuff? The idea was a flock of shots as Bon swam toward the damsel and a close-up of the 'yawning, cavernous jaws' just about to crunch through canoe, heroine, sweetie and all. There was a bunch of coin in it for the show, so they loaded Bon in a shifting box upon a truck and rolled out to Venice, where the 'location' was ready, palm fringed beach and everything.

"All went well. Bon swam out in excellent style, opened his big jaws at the proper time, for, from the stern of a launch, 'Shorty' Alspaugh dangled a



No Fiction Writer in His Wildest Dreams Ever Imagined a Fonder Affection Between an Animal and a Trainer Than That Which Really Exists Between "Rajah" and Mabel Stark

cluster of carrots, while the cameras caught the scene. They had a rope on an end of the canoe, so as to jerk it out of danger, in case Bon got too realistic. But nothing like that happened, and 'Shorty' started to turn Bon back toward the beach. Hot Dawg! Bon paid no attention to him, and just kept swimming out to sea. They crossed his bow with the launch, but Bon simply swerved and kept on going. Then the launch engine coughed a couple of times and went dead. Fully a mile out in the roads lay the *Raleigh*, an English cruiser. Bon made for it, and he went fast, for don't let anybody tell you a hippo can't plow through the water. You can imagine Alspaugh's predicament—a ten thousand-dollar hippopotamus bound straight for Honolulu and he and the boy entirely responsible. 'Shorty' aged a couple of years in the first five minutes.

"In the offing was a launch from a battleship of the Pacific fleet. Alspaugh yelled for help, and an ensign, coming ashore from the ship, instructed the coxswain to steer for the movie launch. Of course, there were hundreds of people watching the hippo from the pier, but that was a good mile up the beach, and the people had no idea what the big animal swimming could be. Many thought it a whale, and a whale is no great sight along the coast. The ensign—I think his name was Hoover—took 'Shorty' aboard and set out after Bon. They

chased that hippo around for an hour and, finally, 'Shorty' got a rope fast around the beast's big neck. It was good ship's rope, too, but Bon busted it twice. Then he felt that he had played long enough and headed for shore on his own. It was all 'Shorty' could do to make the beach ahead of him.

"Bon was all through. He rolled about and gave himself a good sand bath for a chaser and ambled as sweet as you please into the shifting box. That was that—as big a true press story as ever broke, but not a line in the Los Angeles sheets. There was a Nile river hippopotamus crossing the Pacific under its own power, with the United States Navy in chase, and the press agents had to drop it. They were laughed at until they doubted the yarn themselves.

"And you hear stories about the attachment lions and tigers develop for their trainers. Of course, a lot of it is bunk, but what writer has dreamed out a story half so interesting as the affection Rajah, the giant Royal Bengal, had for Mabel Stark, and still has, for all we know. And if absence makes the heart grow fonder, Rajah will just about eat Mabel out of sheer joy, if they ever do get her back to Rajah's show.

"Mabel, who was the star trainer of an animal show, took Rajah from a litter of cubs and raised him on the bottle. She fed the tiger, kept it in her berth nights, made a thorough pet of it. The

little fellow, naturally playful and friendly, became more like a big kitten than any tiger that was ever raised in the show business. It was glad to romp with anyone, but Mabel took no chances. Nobody touched Rajah unless she was around. She trained the cub carefully, taught him to romp and wrestle with her from the first, and, when Rajah grew into the largest and finest specimen of tiger that ever was seen in America, she still was able to wrestle with him.

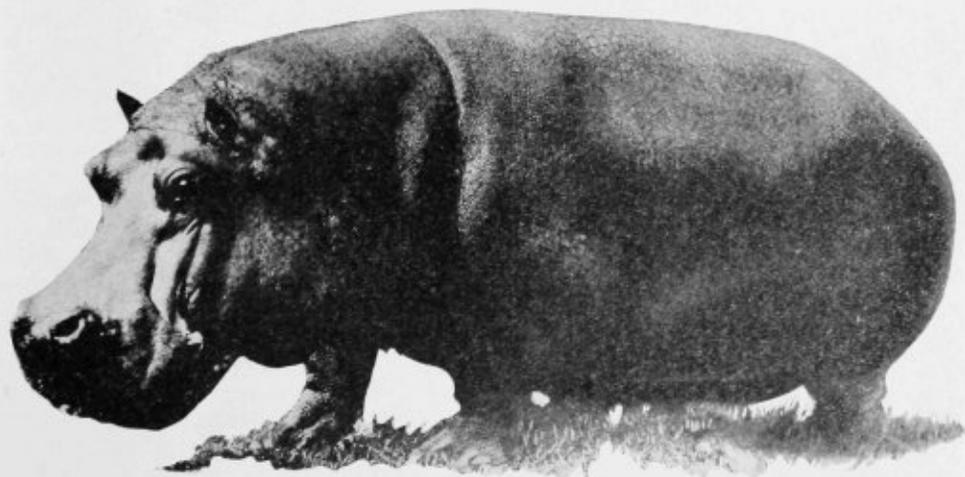
"When Mabel first made up her mind to wrestle the animal in public, she taught the beast to stop purring and, instead to growl ferociously. Mabel, you may know, is a slight, fragile-looking little girl, and the sight of her swaying back and forth with the great, striped man-killer standing head and shoulders above her, its paws pressed into her back, was something to make the hair stand on the coolest of heads. Boy, it was a sight, that act! It made that animal show. And the struggle looked like the real thing to a showman, too, for who ever heard of anything like it before, anyway?

"The climax of the act was a series of roll-overs on the floor of the steel arena, Rajah snarling and growling, Mabel apparently growing weaker and weaker. And just as the onlookers were about to yell and scream their heads off, Mabel would bounce to her feet, fire her pistol and chase the tiger into the runway

toward its cage. I don't know whether anyone ever saw the stunt that put the kick into that rousing finish. It was nothing but a thin bar of chocolate which Mabel carried in her pocket and which Rajah knew he would get after they had rolled on the floor a time or so. What the audience supposed was the beast's angry snarling of its intent to rend the girl limb from limb was nothing but Rajah's begging or speaking for his tidbit, his reward for romping with his mistress!

"But one day last spring, Mabel had a run-in with the management, and, at the same time, one of the biggest circuses offered her much greater inducements than could the smaller troupe she had been with so long. The upshot of it was she left, and there was an awful argument when the owner refused to let her take Rajah with her. You see, Mabel had handled the tiger so long that she had come to think and speak of it as her own. When she saw that the owner was set on keeping Rajah, she offered to buy him. The offer was turned down. Finally, Miss Stark went to the bigger show without her pet.

"Then the owner looked about for a trainer to present the tiger wrestling act as usual. He selected one of the best-know men trainers in the country, a man who has handled sixteen Royal Bengals at a time in the performing arena. Upon this man's first attempt to enter Rajah's



"Bon," the Baby Hippo, Pulled a Real Stunt That Seemed So Far Fetched That the Newspapers Wouldn't Believe It

cage, the beast leaped fifteen feet, and, had the trainer been less expert, his career would have ended right there. He escaped with a torn arm and shoulder, and, at that, he had never locked the door behind him and had not advanced a stride into the den. Now, Rajah had not shown sulkiness after Mabel's departure, nor had the tiger refused his food. There had been no warning that he missed Mabel or resented her departure. Later, another trainer after a patient and calculated campaign of 'making friends' from outside the bars, tried to gain entrance to the Royal Bengal's cage. He found it impossible. The tiger was set to spring the minute he lay hands on the door. There was the threat of instant, deadly attack in the beast's eyes.

"The owner of the show was in despair. Here was the greatest wild animal act in the circus world gone wrong. Animal men discussed the situation with him. 'Perhaps another woman can handle Rajah,' suggested one. 'Of course, that's it!' exulted the owner. 'We'll get the best women trainers in the business.' He did, but when it was explained to them what was wanted, they refused. All agreed that Rajah was a 'one woman' tiger. They would have none of him. And now, for a year, Rajah, the ten thousand-dollar wrestling tiger has been off the billing, and the most sensational wild animal offering ever seen in America is lost. However, the owner is not a stubborn idiot. He has made repeated offers to Miss Stark, and I hear she will go back to her pet next season.

"You read stories of mother love among the 'cats,' and some of them seem a bit far-fetched. Well, I ask you if there is anything to touch the intense, if perverted, mother love of a lioness, a tigress or leopardess, which, fearing harm from the humans about, devours her litter of newly born offspring? We all know that it is a common happening around the menagerie and we try to prevent it by covering the cage with a tarpaulin, so that in the imagined security of darkness the mother will nurse her babies. Yet we lose one out of every three litters among the 'cat' tribe through this strange phenomenon of animal nature. No doubt, in the wilds, when a

'cat' mother is nursing her young in her dark lair and an enemy bounds into the retreat—an enemy she knows she cannot beat off—her only recourse is to destroy her babes. It seems strange that she does this thing in captivity, where the men about her have fed her and cared for her kindly for years.

"But fakers may come and fakers may go, yet they'll never fake anything to hold a candle to the drama and tragedy in the death of Floto, giant performing elephant, who went 'bad' some sixteen months ago. Floto spread terror among twenty thousand people in Orange, Texas, and he died by gunfire because of it. I sometimes wonder if someone with understanding might not have saved him that night. After his first burst of anger, when he knocked elephants flat, tossed wagons into the air and charged his keepers, men, armed with army rifles, poured a volley of twenty bullets into him. Dazed, hurt, probably unable to comprehend why his pals of the circus should turn on him thusly, he must have tried blindly to placate them, for, alone, this great beast lumbered swiftly from the open lot through the long menagerie tent into the huge, deserted big top, and there in the middle ring, where for years he had done his act to the delight and plaudits of thousands, he went patiently, carefully through his routine—leg stands, head stands, shimmy dance, lie-downs, roll-overs and jig dance.

"There in that great darkened tent old Floto did what he thought might please the men creatures, the only thing he knew that had always been asked of him. If only some one of us could have said: 'Floto, old fellow, you've raised h——l, but it's all right, now. We'll just forget it. Come on back to the bull lines and be a good boy.' But no, we couldn't talk to him and we couldn't take the chance with lives at stake. Floto had to die, and he died courageously, swinging a telephone pole in his uplifted trunk as he walked unflinching into the volleys of two hundred riflemen. Now, there was the heroic. There was drama, tragedy, a thrill beyond the imagination of any faker. I tell you that the guy who said 'Truth is stranger than fiction' was a circus animal man—and he knew whereof he spoke."



America Was Discovered by Columbus on the Thirteenth

HOW ABOUT THIRTEEN?

Is It Lucky or Unlucky? It Is Extraordinary How Many Times the Number Thirteen Appears in the History of the United States

by E. LESLIE GILLIAMS

A SHORT time ago a young couple appeared before the city clerk in Jersey City to secure a license. After allowing a breathing spell in which to stroll around the park in the sunshine to get used to the feeling, they planned to have a civil marriage in the afternoon. So engrossed were they in each other's company that they were not aware of what day it was or anything else for that matter.

They might have committed the terrible thing had not the young man suddenly discovered that the large window opposite which they were sitting was numbered thirteen. He called the attention of his young bride to it excitedly and very nervously they moved away to a less dangerous location. Hardly had they recovered from this shock when they discovered something else; the new suit which the young man had bought for the occasion had a label which he had forgotten to tear off and which indicated that the suit was style 113. As

they tore the label off they became suspicious of the day in which the number thirteen was so prominent. They bought a newspaper and to their horror they discovered that the day was the thirteenth of the month.

Needless to say they were panic-stricken. What were they to do? Of course, they dropped all thought of being married on that day, but their license had been made out and now they knew why the clerk had looked at them and asked them if they were not scared. They could not dream of keeping a marriage license made out on that day and they hurried over to the city clerk to tell their sad story. He gave them the good news that nothing was necessary except to let the license lapse and take out another on whatever day they considered lucky. So the whole episode passed with no other bad luck than the price of the marriage license lost and a bit of publicity that they might have escaped had they realized that far from



Perry's Famous Victory Was Won on Thirteenth of the Month

being an unlucky number, in America at least, the number thirteen is eminently one to confer good luck. That is the gist of a unique protest recently sent to the Post Office Department by a southern college. The classes in history of Shepherd College State Normal School, located at Shepherdstown, West Virginia, sent the protest to the postal authorities.

Recently the Post Office Department announced that certain changes would be made in the stamp issues. Some issues were to be printed in different colors in order to prevent mistakes in cancellation by the clerks, and new designs were to be used. Among the stamps that were to be abandoned was the thirteen-cent stamp. Just why is hard to say. Perhaps the heads of the Post Office are superstitious; perhaps there have been complaints by timid persons who have received bad news or unwelcome gifts in envelopes and packages addressed with this thirteen-cent stamp.

But now the Post Office has received a protest of a new and unexpected nature. The history class wants the

thirteen-cent stamp back for the reason that the number thirteen, according to them, has been very much maligned and instead of being a number of ill omen is one that really promises luck. In fact, they claim that America's lucky number is really thirteen and every public use of the number should be encouraged rather than avoided. Therefore, according to them, the issue of thirteen-cent stamps should not be discontinued, but larger numbers of them should be printed and pasted on every possible package.

To satisfy the Post Office Department that such is the case, they have drawn up an amazing list of reasons why the number thirteen is one whose significance for America is one of great good luck. Appropriately enough they limited the number of reasons to thirteen. But many more could be given.

Carried to its logical conclusion we may eventually adopt the number thirteen as a national symbol of luck, as the Greeks used the number three and the Hebrews number seven. Already such a symbol actually exists in America, their being a native Indian tradition that there were thirteen brothers in America who went about helping people. In the winter they hunted the wolves; at harvest time they appeared at the farmstead of anybody where the men were incapacitated and reaped the harvest; in a battle whenever the righteous side was losing the thirteen brothers would appear on the scene and with their mighty bows and arrows would bring victory to the side of the just; at dusk, in the wall of shadowy cloud that appears in the west, they were supposed to be seen making their way to the distressed sun; and whoever was able to make out thirteen figures on the western horizon at that time was considered to have been made lucky for his whole lifetime.

The first reason given in the statement of Shepherd College is naturally enough the fact that America was discovered on the eve of the thirteenth day of October. It is recorded that the sailors of Columbus, those who were confirmed pessimists, tried to create disaffection among the men. They declared that any land discovered on the thirteenth of the month was an evil place and no landing should be made upon it.

As it happened they did land upon it and became fat and prosperous in consequence. Incidentally, during the late war a German professor declared learnedly that the fact that America had been discovered on the thirteenth was a proof that the discovery had been a misfortune to civilization instead of a boon. He declared that the role of America was to be like that of Macedon. Just as Macedon, the new power, conquered the Greek state from whom it received its civilization, so in the same way America was looking up as the conqueror of Europe from whom she had received her civilization. However, there are about one hundred and ten million people who believe otherwise and about two hundred million more during the recent World War who, when Germany seemed certain to triumph, believed with them.

The next reason is one, of course, that everybody would jump at; it is that the nation started as thirteen colonies which became states when the nation was first formed. The fact that there were thirteen colonies united against her may have been hard luck for Great Britain but it seemed the best of luck for the good old U. S. That we started as thirteen states has not seemed to harass the career of the nation.

The thirteenth of the states was Rhode Island, the smallest in the Union but also one of the liveliest. The twenty-sixth was Michigan, one of the most flourishing, and the thirty-ninth was North Dakota, one of the biggest. Today there are forty-eight states. The fifty-second state will undoubtedly be formed in Alaska when that American empire, whose southernmost parallel of latitude is 52 degrees, reaches the development of which it is capable.

Aside from this, the United States is situated between the forty-ninth and the twenty-third parallels of latitude including Porto Rico, making twenty-six, or the double of thirteen parallels for the extent of the country.

The thirteenth president of the country was Millard Fillmore, whose administration was one of the calmest in history. It is true the calm preceded the storm of the Civil War, but it was a real calm during which the foundations were laid which helped to enable the country



John Paul Jones Whose Name Has Thirteen Letters

to endure the crisis of that terrible struggle. It was the administration in which all unknowingly a great piece of luck occurred for the moving-picture industry, for it was in this administration that California was admitted as a State.

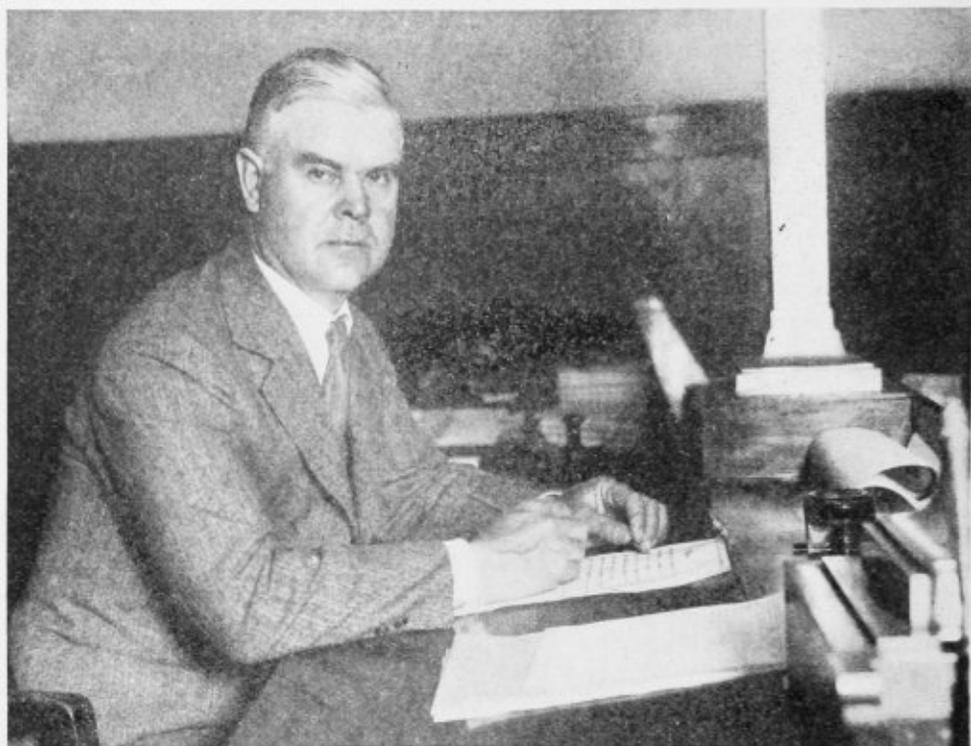
The twenty-sixth president was Theodore Roosevelt, certainly one of the luckiest presidents for himself and his country that we could have had. One of the greatest of the presidents—Thomas Jefferson—was born on April thirteen. He was the third president, and this goes well with thirteen for the number three is regarded as the universal lucky number.

The flag itself is one of the reasons why thirteen might officially be proclaimed as the country's lucky number. Its thirteen stripes will be unchangeable, and the first flag, the parent of all the succeeding flags, had thirteen stars as well.

The words, American Eagle, which is the national emblem, and the national motto, "E Pluribus Unum," both reveal the American lucky number, thirteen, when their letters are counted.

A bit of history was made when the transatlantic cable was put into operation.

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At the Juvenile Court of Cook County, in Chicago, Judge Victor P. Arnold is Doing Highly Constructive Work in the Treatment of Juvenile Delinquency

THE CHILD'S DAY IN COURT

by NEIL M. CLARK

THE father was a large man, muscular, with high cheek bones, a broad face, and the stolid eyes of a Slav. The boy was fair-haired and clear-skinned. In every word and movement he betrayed a quick intelligence. There was perhaps a suggestion of mischief in his blue eyes, but not a thought of malice. Yet he was before the bar of justice in the Juvenile Court. The tragedy of his case began to appear under the careful questioning of the Judge.

Andrew Polacek, the boy, built a pigeon loft one day in the shed back of his father's house. Having no pigeons and no money with which to buy them, and no hope of getting money for them

What Causes a Child to Go Wrong and Be Brought into Court? How Should Their Cases Be Treated to Get the Best Results? Why Is the Parent to Blame for the Misdemeanors of the Child? These Questions Are Answered and Other Interesting Facts About One of the Country's Most Urgent Problems Are Brought Out in This Article

at home, he resorted to the one means of securing them that occurred to him. With a couple of boy friends, he raided the lofts of

two pigeon fanciers in the neighborhood. The owners of the pigeons traced their birds to the Polacek's back yard. Andrew's companions in the adventure were also caught with the birds they had taken; but in both cases their parents promptly settled with the owners. Andrew's father, however, interpreted his responsibilities in a different fashion and Andrew was brought to court.

Joseph Polacek could have managed without great difficulty to pay for the pigeons that Andrew stole. But he is a stubborn as well as a thrifty man,

When the owners of the birds came to his house with an officer, demanding restitution, Mary Polacek, the mother, was alone. Somehow she gathered the idea that they were trying to intimidate her. She grew angry and vociferous, even abusive in her native tongue, and drove the men from the house. When her husband heard of the affair and later when the officer called again, he was ready to fall in with her mood of exasperation. The feeling of personal irritation completely overshadowed the fact that his boy had actually taken the pigeons. Therein lay the tragedy.

Polacek, by intention and training, was honest; yet he condoned filching. He said in court, with the heavy emphasis of conviction, "I tella that boy to do everything what right; joost lak I do."

His first mistake was failing to make Andrew release the pigeons at the start; his second was failing to realize that his attitude then and later could be interpreted by the boy only as silent permission to proceed with thievery, not knowing that it would lead gradually toward the precipice of adult crime, toward filching men's pocketbooks, robbing their homes, or even taking their lives.

If it were not for the Joseph and Mary Polaceks and the lack of standards in their homes, 95 per cent of the Andrew Polaceks would never reach detention homes, Juvenile Courts, correction schools, or the humiliation of probation. This is shown conclusively by records of cases for years in the Juvenile Court of Cook County (Chicago). The crime of the child, says Judge Victor P. Arnold of this Court, is nearly always due to the negligence or ignorance of the parent. And just there, he points out, lies the big problem of the Juvenile Court and of society.

Crime is condoned in the inefficient home. Discipline is weak. The child, left without proper guidance, takes what seems to be the easiest way. His parents—this is typical—send him to pick up coal along the railroad. Observing an open car, he climbs in and discovers a ham. He steals it and his mother puts it on the table! The lad finds himself in good favor. The next time he is sent out he does not find a car open, so he breaks in. The steps from that to house-

breaking, the robbing of stores and street banditry are simple.

Very often the parents simply do not know; they are themselves the product of an environment similar to that which they create for their children. The immigrants who congregate in groups with their fellow countrymen do not easily learn the standards and customs of this country. Even the language is a mystery to many of them. How much more mysterious, then, are the current ideas of liberty and restraint, freedom and order!

The juvenile delinquent, whatever his social history, is at a turning point. Since he would not be in court at all, in the vast majority of cases, if he had learned the right standards of conduct and of discipline at home, the problem of the court, representing society, is to do that—whatever it may be—which will enable him to learn what proper standards are and, through discipline, to adjust his conduct to them.

A father stood before the Court the other day. With him were his five children, the youngest a baby just learning to smile. It was not a case of delinquency but of dependency. The mother was dead. Investigators had found Genevieve, the oldest, a mere wisp of twelve, trying to play the part of mother to her brothers and sisters. The father went off to work each day; he earned seventeen dollars a week. It was learned that the daily meals for the family—even the smallest tots—consisted of coffee and bread for breakfast and lunch and some soup for supper. Such cases link up very closely with juvenile delinquency. The neglected dependent child easily finds larceny or some other form of crime the path of least resistance.

Ignorance of simple rules of living, as displayed in this case, is only too often found in the same homes with ignorance of right standards of conduct. Furthermore, malnutrition, neglect, and delinquency make congenial bedfellows. This father loved his children. But with love alone to take the place of all the rest it would be hard for his children, as they grew up, to avoid the apparent easy paths. The children were placed where they would have better care than the father could possibly give them.



"In Judge Arnold's Court It Is Never Deemed Possible to Deal with Juvenile Delinquents Without First Giving Full Consideration to the Conditions in Which They Have Been Living"

Wisdom in the treatment of dependents is reflected directly in the statistics of delinquency. It is significant that less than 2 per cent of the children who come before the Court as delinquents have been before it previously as dependents.

A different and very common kind of case is that which arises when parents, although they know what the child ought to do, neglect or fail in the strict administration of discipline. One-third of all the girls who come before the Court are incorrigibles; of the boys 17 per cent fall in the same class. Incorrigibility, implying a lack of respect for authority, leads to criminal activity very easily. Often the fault is the sheer incompetency of parents. An example was the case of Harry, who robbed Herndon's store.

For a previous offense, Harry had been committed to the Parental School. But his mother tearfully sought and secured his release on parole. While she could not successfully discipline her boy, she loved him, in a weak way, and it hurt her to think others might discipline him painfully while he was out of her sight.

Harry was still on parole when he took

it into his head to get some easy money. He climbed up to the high back window of Herndon's store, and wriggled through iron bars that would have kept out any but a small body like his. Harry took ten dollars from the till and left the way he had come. He divided his spoils with two of his playmates. The three had a glorious time while the money lasted, but they were caught, and brought to

Judge Arnold's court for trial.

Judge Arnold does nothing hastily. But it did not take him long to decide to commit Harry to the County School for six months. His order was no sooner entered than Harry and his mother burst into tears and fell into one another's arms.

"Won't you give him a chance, please, Judge?" the woman pleaded.

"Yes," Judge Arnold replied instantly, "I will give Harry a chance. That is the purpose of this Court to give boys a chance. I will let the judgment stand.

"It is perfectly plain that Harry has never been controlled at home. It is plain that he never will be. He thinks he can do anything and get away with it. You have helped him to think that. Not intentionally, of course. But just the same, as a mother, you ought to be ashamed of yourself. You took him away from one school where he would have had a chance to get the discipline you will not give him at home. And what good did it do? None, of course.

"I will put Harry where he will get discipline. That is his one chance, now—his chance to avoid growing into a

man who will spend his time in penitentiaries."

Judge Arnold's Court has become the center of a great, constructive work in the treatment of juvenile delinquency. Any program of constructive criminology must have as its primary object the restoring of the criminal to useful citizenship. Discipline, not punishment, is the method. Juvenile delinquents differ from adult criminals in that they are commonly far more susceptible to habit modification. It is extremely significant, therefore, that the experiences and investigations of several years bear out the conclusion that the home is the chief source, or cause, of delinquency. All other causes are, in the bulk, negligible.

It follows that in Judge Arnold's Court it is never deemed possible to deal with juvenile delinquents without first giving full consideration to the conditions in which they have been living. Many variables may enter into a case. The mere fact that a child's crime is heinous by adult standards is not considered an excuse for a drastic sentence. At home, the child may have had special provocation. Therefore, the sentence is measured to fit the disciplinary needs of the particular child. Not all boys and girls react alike to the same treatment, any more than grown-ups do; nor can it be said in advance, with certainty, what is the surest treatment for every case. Some cutting and trying is necessary.

The truth is that there is no method that can be determined in a wholly scientific way. Human nature is one element that defies chemical analysis. No offender can be put in a recognized class with a label attached prescribing, say, treatment No. 7. Each is given treatment based on the social history of his case. The chances are better than nine out of ten that the proper discipline will be found, in time. It may be sooner or it may be later; but ultimately the child will be put into surroundings that will direct his or her unbridled energy into useful channels.

Judge Arnold insists on attempting, first of all, to get the right kind of discipline in the home, if that is possible.

"The ideal case for treatment," he says, "is that in which the parent stands

beside the child in front of me, and confesses failure. Somehow the parent has been negligent. Somehow the child has conceived a scorn or a disregard for his discipline.

"Very often I purposely frighten the child by proposing a sentence that I am sure will be disagreeable. I say that the only thing I can do, in view of the parent's confession, is to confine the child in some place where he will receive the discipline that he will not regard at home. I let the child know that the only appeal from the decision is through the parent. If the father or mother, having already confessed failure, is willing to ask me to give the child another chance, I may see fit to reverse my decision.

"I show, in other words, that I respect the parent. That tends to increase the parent's self-respect, and the child's respect for the parent. The discipline of the home, if it can be made adequate, cannot possibly be equaled even in the best-conducted institutional home or school.

"In those cases where it is plain that the discipline of the child's own home will not do, an institution must serve. The records of the disposition of cases show that about 35 per cent of the boys who come before the court are committed to institutions of one sort or another; nearly as many, about 31 per cent, are placed on probation; while some 29 per cent are dismissed or continued generally.

If sentences in the court are governed primarily by the consideration of what offers the best prospect for adequate discipline, the procedure of the court is likewise governed by the consideration of what will most effectually bring out the human facts. There is little formality. Much of the customary procedure of court rooms has been abolished. The individuals concerned with a given case gather round the Judge's desk. The proceedings are necessarily public, but spectators' seats are some distance from the bench. Those who would listen find it hard to distinguish what is said. The Judge's chief task is to win the confidence of children and parents.

Care is also taken not to write many details of a delinquency case on the pub-

(Continued on page 156)



John McWaters, With Fifty-Four Years at the Throttle of the New York, Atlanta and New Orleans Limited, Is Probably the Oldest Engineer in the World. He Refuses to Retire on a Pension. He Has Never Had an Accident Which Resulted in Even One Death

Believing That a Forger Would Balk at the Procedure, Nick Harris, Famous Pacific Coast Criminal Detective, Advocates Signing All Checks By Fingerprints. The Idea Sounds Good to Experts Who Say It Is Absolutely Feasible



As Many as Three Million Chinese Queues Came in on One Ship, Being Part of the Yearly Order of Human Hair for the Oriental Textile Mills of Houston, Texas. On Arrival the Hair Is Sterilized to Rid It of Germs. The Mills and the Towns Where the Employes Live Are Noted for Their Freedom From Disease



This Wonderful Bit of Sculpture By Alexander Zeitlin Is Unique in That the Figure Weighs Nine Hundred Pounds and Is Supported Only By the Piece of Drapery.

THE WHITE MAN'S INFLUENCE IN AFRICA

Railroads and Motor Cars Have Robbed the Dark Continent of Its Terrors "Keep Africa White," Has Come to Be a Slogan There

AFTER all the boyhood literature of the wilds of Africa, and the maps marked either black or white to designate unexplored sections, and our Sunday magazines telling of the possible existence of prehistoric animals and strange peoples that live in the central parts of Africa, it is disillusioning to learn that in reality most of Africa has all the modern conveniences of civilized countries together with its modern industrial vices.

Recent investigation and reliable American travelers and commercial emissaries tell of the new Africa that began right after the Boer War and the great impetus that has come to the country following the World War. To illustrate this conquest of one of Nature's last primitive outposts it is not at all unusual to see the more common makes of American and English motor cars far up in the Belgian Congo. They are hardly given a glance by the men and women in the very sections that some years ago were made notorious because of the natives mutilating themselves with ivory decorations.

In other sections equally wild a few years ago, American-equipped trains are speeding through the jungles and American drills are being used



Although He Had to Shoot This Seven-Foot Leopard, He Says It's Safer to Live in Africa Than in America. He Doesn't Even Lock His Doors

by
UTHAI VINCENT WILCOX

in the mines and American saws are felling century-old trees. Along the coasts made famous by tales of slave ships and pirates and warlike natives there are now pretty girls bathing or riding their surf boards and in the towns double-deck street cars carry their passengers.

One missionary, a keen observer, who has spent many years building up schools in the central parts of Africa says that he finds it necessary to carry some of his snap-shots taken over there to prove to his friends that lions are not running about wildly and that snakes are not hanging from all the trees. On the other hand, strikes and riots are the latest acquired habits of the people of Africa. They are now civilized.

It sounds strange to hear about a serious economic problem in Africa. And stranger still to hear the new slogan born of riots and agitation and propaganda:

Steel Rails Lead Across Africa and Fine Trains Are at the Service of Travelers and Those Who Farm and Mine





A Sawpit in the Heart of Africa Presided Over by Natives Under the Guidance of Mission Teachers. The Country's Present Advancement Is Due Mostly to the Natives' Ability to Learn

"Keep Africa White!" Letters from those who are watching the development of the country and are interested in its advancement are disturbed over the new turn of affairs in the industrial sections.

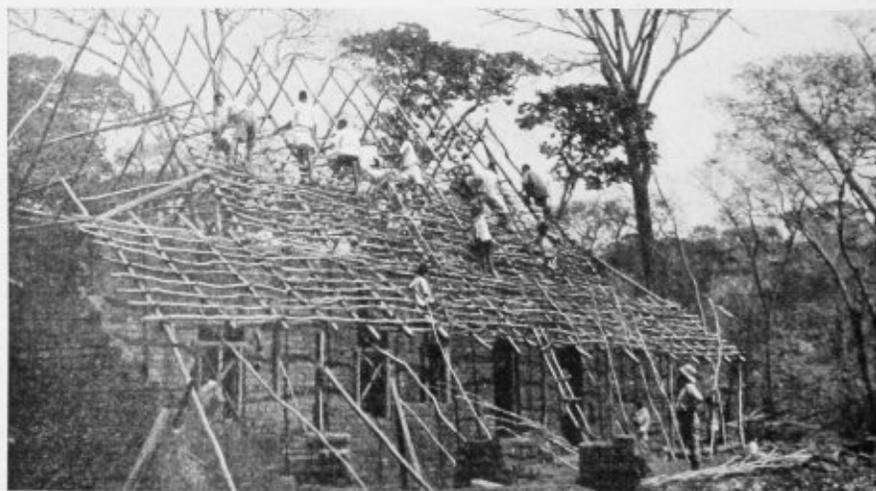
The problem has come to be even

more than an economic one—it is also a racial question. Take the recent revolts and disturbances in and about Capetown and farther up into the central part of Africa following the mining sections. Missionaries and travelers who have spent long years there say that it is fundamentally due to the distinction of the three color lines. There is the Englishman, the Boer, and then the native. While it is not exactly a caste system it is supposed to be tacitly understood that the order of preferment goes in just that way.

Over on the western coast the question is a very live one. Though apparently everything is now quiet there, it is nothing more than the smoldering quiet of the volcano.

"A White Africa" sounds anomalous here in America, but there it is a popular slogan. With organizations in New York gathering petitions and endeavoring through the League of Nations to have Africa allotted as a home for the black man, it seems almost impossible to believe of strikes and riots because of the insistence of white control.

"Take the recent strike," said one long-time resident of Africa. "The question was raised when the white man came in and, disliking to do the hardest sort of manual labor, employed natives to do it. While these natives are doing the hard work, the white man may be standing about smoking. That is all



This Bungalow in the Jungles Has Walls of Sun-Dried Brick and Has Doors and Windows of Glass and Many of the Best American Improvements



Sometimes It Is the Americans Who Learn. This Little White Chap Enjoys Playing an African Game

right until the mine company in looking after dividends notices that the native can do as skilled work as the white man so decides that twenty-five to thirty shillings a day need not be paid to the white man while the black does the work for six."

The average native of Africa learns quickly. He learns both the vices and the disagreeable habits of civilized man as well as his lessons taught by the mission schools. Indirectly the mission educational work has hastened the development of Africa greatly.

With thousands of churches and Sunday Schools talking about "darkest Africa" and its needs and pouring their gifts into work for the natives of Africa, there was bound to be a change. The mission schools have taught the native how to read and write and how to use the tools of civilization. Learning this under the kindly and beneficent missionary he is ready for the big labor market about the mining territory and along the railway lines. Under the inducement of greater wealth than he had ever dreamed of before, he drifts down toward the cities and is perfectly willing to work for wages that to the white man and his standard of living mean starvation.

"What's the plan of those who wish to make or keep Africa white?" these travelers and missionaries have been asked.

"To put the blacks—the natives, on reservations." It sounds like a touch of America, the talk of reservations. But it is more than talk in Africa. In the southeastern part of Africa there has been found a section that seems adapted to this purpose. It is devoid of mineral as far as known. It is fairly well watered and the natives seem to have no objection. So the plan now is to send more of them there, taking them out of the mining sections. Legislation is already being sought that will guarantee them from molestation.

However, the native African is highly regarded as to his ability to learn and absorb the customs of the white man. He is said to compare very favorably with the negro of America after a little time is spent on his education. Taken in his primitive state by the mission schools he is very much of a natural gentleman, stories to the contrary notwithstanding.

It, unfortunately, does not take him long to learn how to fight and to do all the evil things that his white brother does about the mining towns. Yet for all of that, white women, when out in the wilder sections of Africa, a few miles from the railways, are absolutely safe and go about alone without fear of harm of any kind from humans.

Where the native black man is en-

(Continued on page 134)

"FORE" O'CLOCK IN THE MORNING

By HARRY IRVING

S o m e b o d y w h o claimed to know said the other day that there are five million golfers in the United States—one person out of every twenty. Few of them can afford to belong to private golf clubs. They must play, if they play at all, on public links. Those whose duty it is to provide these public courses have to be kept stirred up if the average citizen who golfs isn't to be crowded off them. The incident related here really happened in Chicago. Chances are it is duplicated in your town. At any rate, whether you are a golfer or not it will amuse you.

TIME—An hour before dawn on any Sunday morning.

Scene—The benches near the starter's office opposite the first tee of any public course in one of our big cities. Upon the benches sit shadowy figures, both male and female, while other figures continue to arrive—singly, in pairs and by the dozens.

Smith (sleepily)—What time is it now?

Brown—Four o'clock. An hour until the starter gets on the job.

Smith—Ye gods, but it's tough getting up in the wee, small hours just so a fellow can get in a round of golf. Time was when Sunday morning meant an extra forty winks, but not since I took up this game. I like my sleep as much as ever, but I fancy my golf more. I've got just enough Scotch in me—

Brown (coming out of a doze with a start)—Scotch, you said. Where do you get it? How much a pint? My boot-legger—

Smith—I'm talking about blood, not hooch. I was remarking that there was just enough Scotch in me to make me willing to set the old alarm clock for 3 a. m. Sundays and holidays so's I can come out here and whang the little old pill for an hour or two. This is the only place I can play. The income-tax collector doesn't leave me enough to join a regular club. That calls for a car to get out to it. Now it's getting so costly

to play even on a public course pretty soon I'll have to give up the game altogether. Time was when a couple of dollars paid your green fees for all season. But they've kept raising the ante—

Brown (emerging from another doze)—Ante! Sure I did. I distinctly recall putting in a red chip. Oh, beg pardon, old man. I was woolgathering again. Played poker with the boys until two o'clock so I'd be sure and get here on time. An alarm clock won't get me up in the middle of the night. So I don't go to bed at all Saturday nights.

Smith (peering around him)—That snore on the other side of you sounds familiar. It's Jones, ain't it?

Brown—So it is. (Digs Jones in the ribs.) Hey, wake up and pay for your lodging.

Jones (waking up with a gurgle and a snort)—All right, officer. Just as you say. I know it's against the rules to sleep in the park but you ought to know me by this time. I sleep here every Saturday night so I'll be in time for a bit of golf—

Smith—Aw, let him sleep. Brown. It's still half an hour before the starter gets here and opens up the registration books. Poor devil. He's in Dutch at home as it is. His wife doesn't know the first thing about golf. She thinks he's nuts.

Brown—Wish my storm and strife were only that reasonable. She thinks it's a blonde or something. Say, look at that chap just breezing up. He's got on house slippers and pajamas under that pair of trousers. Must be a sleepwalker.

Smith—Nix, you're wrong. He's one foxy bird, that's all. He lives only a couple of blocks away. Gets up so as to land over here about half an hour after the registration starts. He signs up and goes back to bed, knowing that with all the mob that is ahead of him it will be the middle of the afternoon before he can tee off. Wish I could do the same thing. But I live a mile away.

Brown—There comes another wise gazabo. I know him. He brings his fishing poles along and while he's waiting for his time to play he goes over to the lake and hooks himself a mess of perch for supper.

Smith—Any truth in the report that the park board is going to use that land reclaimed from the lake for another course?

Brown—Listen, brother. I've been living around here for ten years now and I've heard that story so often it's getting hoary with age.

By the time
that new
course is

ready I'll be wearing whiskers and bouncing my grandchildren on my knee. Let's go over to some grassy spot and practice a few mashie shots. It isn't so awful dark.

An hour later, after all those ahead of them have registered, Jones, Smith and Brown scrawl their names and discover that they'll be able to play off around 3 o'clock. As they start for the lunch room for a bite of breakfast, they see White dashing madly up and taking his place at the end of the line.

Jones, Smith and Brown (in chorus)—Oh, White, where do you spend your Sunday mornings?

White (indignantly)—Why, it's only six o'clock. I'll get in a round, then drive up to a place fifty miles from here, see a chap on business and get back in time for supper.

Chorus—Yes, you will. We're ahead of you and we won't get to tee off until three o'clock. Better give up that trip.

White—Not by a darn sight. I'll register and make my trip up there before I play. Say, you fellows wait a bit and I'll join you for a bite to eat.

John, the Starter—Sorry, ladies and gents, but that will be all for today. We've got enough names on the books now to last until 8 o'clock tonight if we start a foursome off every five minutes from now on. All right, you fellows in the first foursome. You can start now if you'll promise not to delay the bunch behind you looking for balls in the dark.

White—Can you beat it? I'm off the game for life. Stick around, you birds,

and watch me
bust every club
I've got in the
bag.



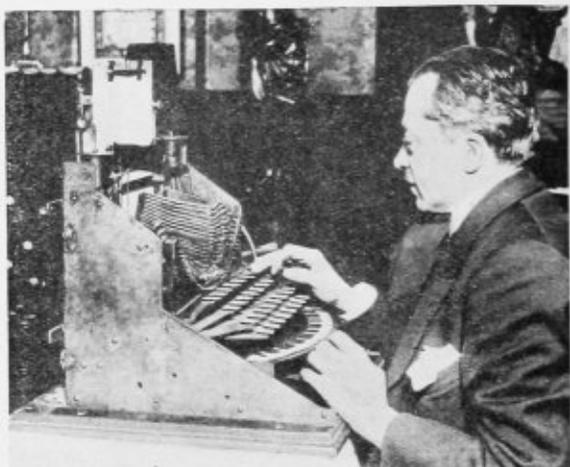


The New Battle Tank, Known as Walter Christie's Amphibious Wheel Caterpillar Tank, Recently Succeeded in Running Along the Shore and Then Crossing the Hudson River Under Its Own Power

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You Should See Those Spots Glitter as Miss Heather Thatcher, of the London Winter Garden Show, Cavorts Around the Stage in This Costume of Spangles and Fascinating Colors



Professor Fortoni, an Italian Musician, Has a "Music Typewriter," Which Copies Music Much the Same as the Ordinary Typewriter Copies Ordinary Print



Testing Out a New Airplane Propeller Blade Which Can Be Put in Three Positions and Is Used for Cutting Down the Space Required for Landing.

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Shall We Really FLY Without MOTORS?

by
ERNEST COLER

☛☛ To those who are of the opinion that all progress consists in the upsetting of precedent, the abolition of established standards, the enthroning of newly discovered truths in the place of old ones, this article will prove that there are occasions when advancement is found in a return to first principles. Often the failure of an invention causes its originator to cease his efforts. A year later, perhaps ten years hence, the selfsame idea rises like a Phoenix from the ashes of disappointed hopes and proves the abandoned principle right. If this queer manner in which the fates sometimes deal with important discoveries ever called for exemplification, the proof is furnished in this article in which the author discusses the ultimate influence of the latter-day glider upon the future of all flying.

ON a dull and blustery August morning in the year 1896 two men busied themselves about a round stone tower near Spandau, Germany. They had been there many times before though seldom accompanied by others. Invariably a queer contrivance having the rough outlines of a gigantic bird with outstretched wings would be hoisted to the summit of the tower. Then one of the men, after strapping himself into the odd machine, would jump off the tower and soar over the valley which expanded below.

To the onlookers the activities of this particular morning were similar to those that had been going on for a number of years. Again one of the men strapped himself into a place beneath the spreading wings and jumped.



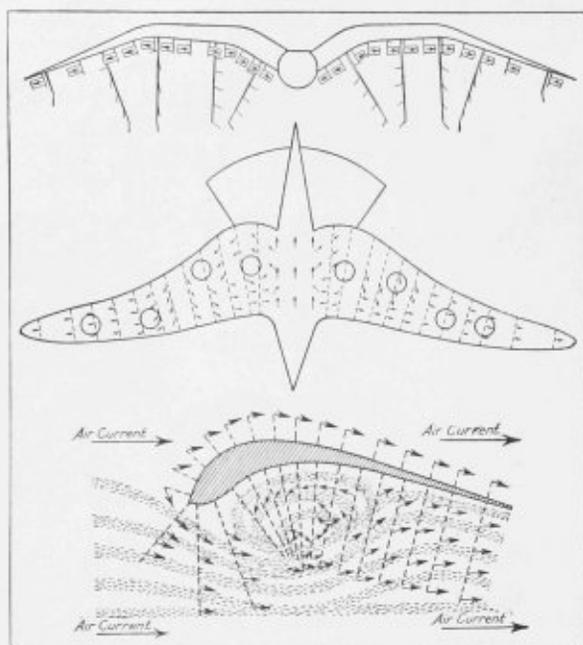
The Gull Is a Great Soarer, Applying Very Little Energy in Flying. Sustained Flights of Heavier-Than-Air Machines Are Made Possible Through the Study and Imitation of the Soaring Type of Bird

As so often before the man-bird soared over the fields in sweeping, graceful flight. When it had reached about the center of the often-traversed course, a gust of wind raised the machine to a higher level. Then, suddenly, the apparatus tilted to the left, crumpled up and dashed to earth in what present-day aviators describe as a sideslip.

High up on the tower stood Gustav Lilienthal who thus witnessed the death of his brother Otto, the father of modern flight, who during his experiments had worked out and proved the physical laws of flight that are as sound today as they appeared chimerical in 1896 and even much later.

* * *

Again it is August. But the year is 1922 and the place is the Wasserkuppe, a promontory in the German Rhoen mountains, when the whole world is stirred by the news that the German flyer Martens, employing a motorless plane, has succeeded in remaining in the air for one hour. Even before the newspaper reader has time to place



The Tiny Flags in the Upper Figure Show That the Head-on Wind Meeting the Thickened Wings Is First Swirled Around and Then Reversed So That the Current Under the Sustaining Surface No Longer Moves from the Front to the Rear but from the Rear to the Front. The Center Figure Shows the Flags Mounted on the Under Side of the Sustaining Surface. The Circles Indicate the Places at Which the Winds Turn in a Direction at Right Angles to the Wings and Finally Leave the Wings Lengthwise with the Wing Tips. In the Lower Figure We See That the Air Current Is Deflected Downward Several Feet in Front of the Wing. The Current Then Forms an Oval Whirlpool with Two Centers and This Whirlpool Is Drawn Out in the Shape of Spirals Toward the Wing Tips. In This Manner It Becomes Possible for a Straight-on Air Current to Lift the Sailplane and to Carry It Forward at the Same Time

the proper valuation on the feat, cable dispatches bring word of a two-hour engineless flight by Hentzen who a day later excels his own record and remains aloft for over three hours during which time he maneuvers his craft, causes it to rise to a height of 1000 feet, describes figure eights and finally returns to the place from which he started. Almost before the cables are still from flashing the news of that record, there comes the news that Alexander Maneyrole, of France, has eclipsed the German records by remaining in the air, in a glider, for three hours and twenty-two minutes.

All this was very wonderful and the press of the world has since busied itself with the subject in stories and in pictures, in reporting facts and indulg-

ing in speculation. Today, in the sober light of actual accomplishment, what is most interesting in connection with these glider flights or soaring contests is the fact that the machine with which the Lilienthal brothers conducted their pioneer experiments and the sailplanes which so recently moved man's conquest of the air within reaching distance, were built, purely and simply, upon the principle of imitating bird flight.

The gliders which participated in the recent German contests were mainly monoplanes built according to the tenets laid down by the Lilienthals twenty-five years ago. This fact illustrates the extraordinary truth that these early experimenters had reached an exact knowledge of the laws underlying flight and that those who followed them and failed either grossly misunderstood them or arbitrarily closed their minds to the practical value of the discoveries.

It would be hasty to regard the new motorless flyer as a serious competitor of the present-day conventional airplane. What the exploits of Martens, Hentzen and others have demonstrated is, first, that the problems of flying are really not yet solved in any existing type of flyer and, second, that the road along which the final solution will be found is now very clearly indicated.

In the final analysis, the success of Martens, Hentzen and their fellows is simply due to the circumstances that these men do understand and by accepting the master's teachings manage to convert Otto Lilienthal's dream into realization. The "Vampyr" of Hentzen, for instance, with a wing spread of 42 feet has sustaining surfaces totaling 172 square feet, while Lilienthal's last glider had a width of 23 feet and surfaces totaling 172 square feet. In the earlier gliders the pilot usually hung

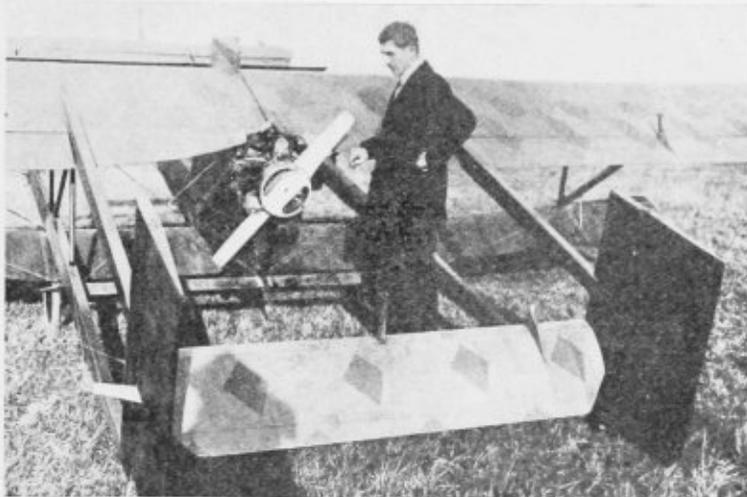
suspended under the wings, employing his feet in steering the apparatus. The latest gliders have regular cockpits and are provided with ingenious steering means some of which are so contrived that they act automatically with the variations of the wind.

Whatever inclination we

may have to hail the past year's motorless flying progress with enthusiastic acclaim must be tempered with the realization that until the gliders' designers and pilots conduct their flights in level country instead of in mountainous regions such as the German Rhoen, a practical application of the laws underlying motorless flight cannot be achieved.

What must be remembered above all is that it is not the rising air currents or winds that lift the glider and give it forward movement, but the more or less horizontal currents which, impinging on properly shaped wings, are capable of producing both lifting and forward motion. With a correctly shaped wing, patterned as closely as possible after that of the bird, the head-on wind meeting the thickened wings in front is first swirled around and then reversed so that the direction of wind moving under the sustaining surfaces at this point is no longer from front to rear but from the rear toward the front. It is this peculiar and little understood modification of the air currents that drives the glider forward in a wind blowing against it.

The wind conditions encountered in mountainous or hilly territory are not those most conducive to air-sailing, because wherever hills abound the air streams move more in an upward direction so that the rising currents must be



The Glider, Equipped with a Small Help Motor, Is Capable of Continuous Flight Even When the Wind Velocity Is Subdued

utilized in lifting the glider and in carrying it forward. The most desirable wind, however, is that which strikes the wing from in front.

According to the surviving Lilienthal, the brothers were originally far from the truth they sought to discover. Their first experiments were made with moving or flapping wings; only years afterward, during the flying of a kite, came the fundamental ideas which they worked out later. In flying the kite they noticed that when the kite surface was brought into the wind at a certain angle it would not only sustain itself without the usual pull on the string, but would even move forward.

For the purpose of demonstrating the theories suggested by the behavior of the kite, the Lilienthal brothers then constructed a glider in the shape of large bird wings and released it on a cable stretched between two towers where it was exposed to the wind. The entire surface of the model was dotted with tiny flags so mounted that the flags' staffs turned in sockets in accordance with the variation in the direction of the wind. The result of these trials is quite clearly shown in the figures on page 52, which represent the trial model assuming the wing position of a condor, the bird whose extremely long wings make him the

(Continued on page 146)

HOW CANADA TEACHES HER PEOPLE

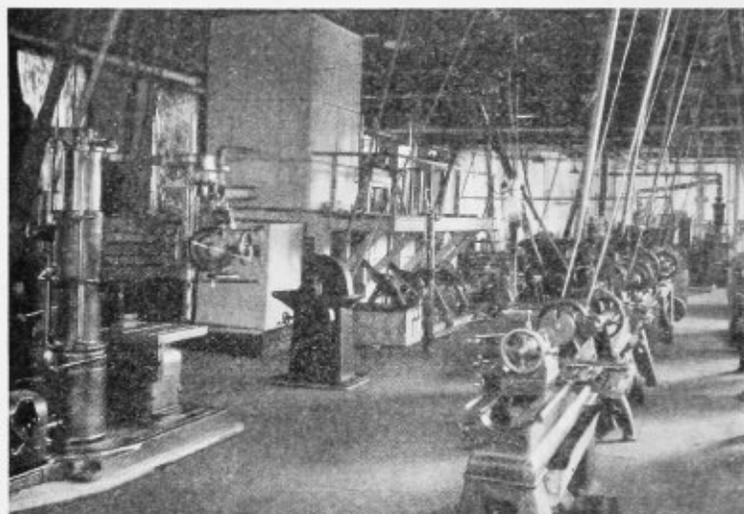
A System of General and Technical Education Which Reaches into the Most Remote Sections of the Country

by EARLE W. GAGE

THOUSANDS are enrolling in Canada's "make good" clan. Rating themselves among the students today, they will be victors in life's battle tomorrow. They are experiencing the joys of attainment which make for achievement. "Get into the game of

lege and a whole series of secondary technical schools. These have been developed far beyond the scope of the dreamers of the idea, until today they are ministering to workers in all communities.

The Technical College is the center



The Machine Shop in Nova Scotia's New Technical College and (Below) the Mechanical Engineering Laboratory



learning, and keep going until you reach the top!" That's the battle cry of the progressive Canadian.

Training for life work is a new idea on the American continent, and Canada was first to effect the plan of preparing people for a definite task. Her vocational system of education is comprehensive, including agriculture, industrial, commercial, fisheries, home economics and, where ten or more in a given community desire training in any special subject, classes are formed and an instructor secured to teach the subject, no matter how technical.

Nova Scotia was first to establish a system of technical education. The legislature provided for a technical col-

lege and head of the system. It provides for the training of technicians, engineers, and leaders in industry, under an agreement of affiliation with five colleges and universities, which precludes duplication of effort. The four-year course for engineers is split in halves; the general training in science, mathematics, English, drafting and surveying is given in each of the affiliated institutions. The professional training of the junior and senior is carried on by the central college.



Citizens of the Dominion Can Obtain Instruction in Almost Any Desired Line. This Is a Mechanical Drawing Class in Halifax.

In the Technical College the staff and equipment is provided by the province in the four basic branches of engineering, namely—civil, mechanical, electrical and mining, and students may graduate with the degree of bachelor of science.

To date more than half a million dollars has been spent on buildings and equipment for the college, and it stands as a thorough, scientific, well-staffed institution for engineering training. The college at all times keeps in intimate contact with the industries of Nova Scotia and carries out industrial research and commercial testing of materials, ores, etc., in order to aid efficient production and the utilization of the rich natural resources of the province.

The graduates of these schools are to be found on the staffs in every important industry in Canada, while a few hold responsible positions in the wider fields in the United States and Europe. All of which demonstrates that the progressive Canadian system of training men and women for a definite life work has made good in the comparatively short time that it has been in vogue.

In order to assist industry in the proper development of bosses, foremen and superintendents, the Technical College has instituted a wide range of subjects. Ambitious men who had to leave school at an early age and who possess qualities of leadership in industry often find the path to promotion blocked be-

cause they do not possess certain technical knowledge. They are often highly skilled mechanics, but do not have acquaintance with the fundamental science to advance to a higher position.

For such, the short courses open the locked door to success, since the only requirements for entrance are a public school education and practical experience in industry which fits them to profit by the instruction.

Each man can take only one course and throughout every day he devotes all of his time for three months to lectures, recitations and laboratory work in this one subject. A special corps of instructors who have all had thorough training and long practical experience is provided for these short courses.

That the instruction vitally aids men along in years, who otherwise would continue to find life's labors a humdrum affair, is demonstrated by the fact that the average student presenting himself for these special short courses run from twenty to forty years in age and all are in deadly earnest.

The amount of knowledge absorbed by these adults is scarcely short of marvelous. They take their newly acquired knowledge back to their jobs and it is not long before they begin to forge ahead. Some of these short-course students in a few years have climbed to positions quite as important as if they had had a full college course.

Simply because a resident of Nova Scotia who desires to better prepare himself or herself for life resides in a remotely situated section is no bar to higher training and self-help under the advanced system of education. The Technical College has a correspondence study division which offers a wide range of courses to all citizens who cannot leave their present work in order to improve their knowledge.

The work offered covers a multitude of courses in general education, commercial and salesmanship courses, industrial and scientific courses, training for college matriculation and homemaking instruction. All the courses are divided into short complete units so that each individual may start on the plane where he is fitted to begin and can stop when his ambition or his needs are satisfied.

This work is carefully adapted to the requirements of the people living and working in Nova Scotia, and each case receives the most careful attention. All courses are sold to students at cost. In this way the service can be carried to the remotest hamlet, farm or lumber camp.

The most widespread effort in the realm of secondary technical education consists in a system of evening technical classes and schools which are maintained in almost every town of any industrial importance and every colliery town. The classes are held throughout the six winter months, the type of instruction, number of classes, etc., varying according to the dominant industrial activities in the various localities.

Instruction in practically any technical subject is organized where ten students are found to attend a class and an instructor obtained. The teachers are recruited mainly from the ranks of foremen, superintendents and the technical staff of the industries, and the work is always intensely practical.

The range of instruction covers such subjects as business English, bookkeeping, stenography and typewriting, shop mathematics, mechanical drawing, machine drawing, machine design, architectural drawing, building construction drawing, architectural design, estimating, car-building design, structural steel drafting, ship drafting, elements of electricity, direct current machinery, alter-

nating current machinery, gasoline engines, automobile repair, general chemistry, metallurgical chemistry, technical chemical analysis, steam engineering, marine engineering, navigation, garment making, dressmaking, millinery, cooking, home management, land surveying and coal mining methods.

The classes are practically free because each student has only to pay a deposit of three dollars as an evidence of good faith and this is refunded at the end of the session on the basis of the student's attendance. Thus the opportunity lies at the threshold of every worker in Nova Scotia to acquire an education that will make him a more effective and intelligent producer without losing an hour's wages. Thousands of ambitious men and women flock to these classes every year and large numbers of those in responsible positions today attribute a great part of their success to the knowledge gained in these schools.

Men in the coal mines who hold directive positions have to qualify by passing government examinations before they receive certificates of competency. The evening schools in all the colliery towns give the necessary training to enable the miners to qualify for such examinations and certificates. Consequently nearly all the managers, underground managers and ovenmen in the mines are native Nova Scotians and former students of these schools.

Right here is a good suggestion for the mine operators in the United States to take to heart, namely, the urgent need of their system being made to include a plan, such as Nova Scotia's, whereby the most humble picker may rise to the most responsible position through help given him by those for whom he toils. This will tend to put native sons in the lead, leaving less room for the foreign agitator to perform his work among the disgruntled and too often down-trodden laborers.

"The whole development of technical education in this country has been of such recent origin that the best methods of full-time instruction of youths for gainful occupations in our day schools have only recently begun to be standard-

(Continued on page 152)

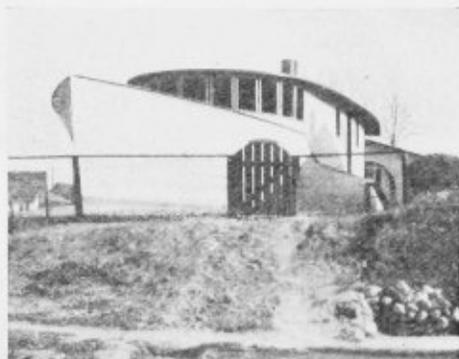
"A Fish Out of Water"

by B. W. ELSOM

HERE is a man in Milwaukee who doesn't agree with modern architects in their efforts to economize on space in building small bungalows and apartments. He says that the problem of planning comfortable living quarters with the greatest economy of space was solved long ago by the shipbuilders. Therefore, the way to get the most compact and at the same time the most comfortable living quarters is to build your home like a ship. To back up his belief he has proceeded to do just exactly that. His new home, which is now nearing completion, is built on the lines of a modern steam yacht.

This "cruiser-bungalow" is sixty-five feet long and eighteen feet wide across the beam. Within this space the designer has succeeded in utilizing every available inch of room to provide comfortable living quarters. A landsman would say that the bungalow had five rooms and bath—a combination living room and sun parlor, a dining room, kitchenette, two bedrooms, a study and bath. A seafaring man would call it a cruiser, fitted with a main cabin, a dining cabin, a galley, two staterooms, a recreation room, and bath.

This novel home was built entirely by ship carpenters. Not a single nail was

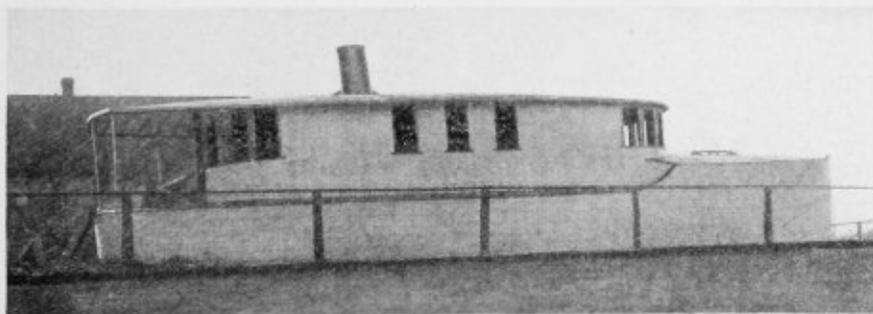


What? A Ship Without a Sail or Motor? Exactly. It's What This Man Calls a Most Comfortable and Space-Economizing Home

used in its exterior. Every plank was fastened with screws and every seam calked with marine glue. The decks also were calked. The red metal smoke-stack was set at a nobby angle, slanting just enough to imitate the stack of a cruiser.

The enthusiastic owner of this land-cruiser insists on applying nautical terms to all the furnishings of his home. Instead of speaking of the first and second story of his house, he refers to the "main deck" and the "lower deck." His kitchen is the "galley," and the stairways are "hatchways." The front porch is the "forward deck."

This unusual bungalow has naturally attracted considerable attention from neighbors and passersby. It stands on the brow of a steep bank overlooking the Milwaukee River, which lies a hundred feet or more below. Some of the more facetious neighbors have suggested that its owner is following the example set by Noah, in anticipation of a second flood.



This Home-Builder Says That Shipmen Have the Right Idea When It Comes to Putting Up the Best Type of Bungalows

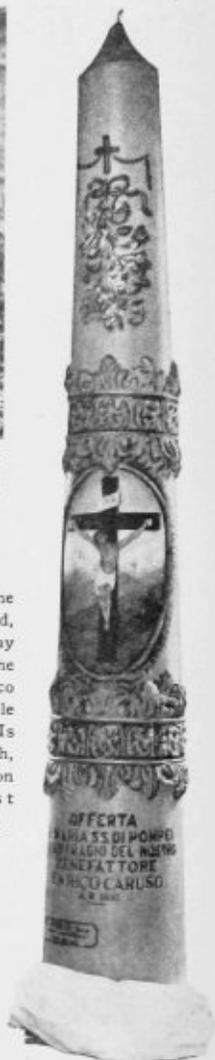


Looks Like a Couple of Ante-Diluvian Monsters Scrapping, Doesn't It? This Unusual Photo Shows Two Iguanas—Deadly Poisonous Lizards—in a Real Battle to the Death



This Cheetah Relieves Its London Owner from Worry About the Safety of His Car—It Might Work in London but in New York or Chicago It Wouldn't

This Candle, the Largest in the World, Will Burn One Day Each Year to the Memory of Enrico Caruso in a Little Chapel in Italy. It Is Sixteen Feet High, Weighs Over a Ton and Should Last Eighteen Centuries



This Young War Is Just the Annual Sophomore - Freshman Class Rush At Leland Stanford University in California



☛ *Maybe you've wondered too*

How They BUILD PLAYS in One Week

☛ *The Stock Company—
A Big Entertainer for Those
Out Front and a School
for Those in Back. It's a
Tough Life and the Play-
ers Work Twelve or
Thirteen Hours a Day*

by

HARRY IRVING SHUMWAY

THERE is a certain glamour which hovers about the stage, a fascination that causes many a boy and girl to leave home and seek to know this quality more intimately. In this, as in other walks of life, many are called but few get on the pay roll. Who is there of us who has not longed to be the clown, has not yearned to play the hero in hero's costume and frequently embrace the exquisite young heroine, has not wished he might be on the other side of the magic row of lights? Darn few who haven't had the wish at some time or other.

To go back to the glamour business mentioned before, if one feels the glamour is so strong that he must get in where it is—just let him go behind and work with a stock company. It is then that he will take another look at the glamour and find he has made a slight error. On closer inspection he will discover that the chief word about a stock company is spelled W O R K.

The working day a first-class actor in a stock company puts in would make any able-bodied truck driver quit in dismay. The truck driver dawdles around at his game something like seven or eight hours and then feels hurt because he has done



Refreshing His Memory Just Before Going on. In Another Moment He Will Be Out in Front Doing Everything from Tender Love Scenes to Getting an Unlooked-for Black Eye

too long a stretch. The stock actor is in the theater something like twelve to thirteen hours on and off, not counting time for study outside the theater.

One hears it spoken often that "Miss So and So, now a star, got her training in stock" and that "stock is the greatest school for the actor." It is. It means more than that. It means that anyone who can go through it and keep his sanity and health intact is a hardy survivor and is meant for long life. The strain on the nerves and general physique is tremendous. But more about that later.

Let us, if for no more reason than to dodge the war tax, step into a first-class stock theater and see a performance. The theater itself is in most cases a perfectly appointed house both back and front. We are intrigued by some show which may have been on Broadway but a season or so ago and we are willing to gamble fifty cents or a dollar on it, get-



Director, Scenic Artist, Carpenter and Electricians Putting on a Set for an Act. Lighting and Scenery Play an Important Part in Modern Theatrical Production

ting for that sum a seat which at the original production was three times as much.

The curtain goes up and the play starts. If we are not familiar with stock work we look surprised after a while and say, "Why, this is fine. These people can act. The scenery is good. How can they do it and put on a new play every week?" And we sit through three or four acts, generally coming away with the feeling of a well-spent evening.

If we think about it further, we wonder how such excellent work can be given considering a new play is given every week. If we saw the inside workings we would wonder still more. We would think it a truly remarkable thing that in one week's time such a production, often fine in acting and settings, could be given.

The actor who works in stock does something like forty to forty-four weeks in his season. He may not be in every one of these weekly productions, but this fact doesn't permit him to take a vacation because even the week he is not appearing he is rehearsing for the next week's play. So he is really working the number of weeks his contract calls for.

The start of a play, that is, the first reading and rehearsal of it, doesn't look like much of anything to the uninitiated. Often the rehearsals are not even held

on a stage, but in some space in the building where a few chairs and a table may be placed and adequate foot room left. The doors, windows and props are imagined. The reason the stage itself cannot be used is because the scenic workers, carpenters, painters and electricians are building the set on the stage.

The parts are given out to the members of the company by the stage director who is responsible for the acting end of it. In each book are found the actual speeches of the actor who has that part, with brief directions as to where he is to stand, his business, etc. Preceding each of his speeches is the cue which consists of the final two or three words of the actor speaking just before him.

It is around nine or ten o'clock on Monday morning or perhaps Tuesday morning. The stage director says briskly, "Well, boys and girls, let's go." Immediately the actor who has the first lines in the play opens his part book and starts reading. There is no dawdling or delay. He shoots it out and the new play is on. As we said before it doesn't look like much of anything. An actor reading his lines from a book to another actor reading his fails to stir us much.

Every now and then the director, who has the entire typewritten play in his hands, halts the game and gives some bit



The Director Gets Excited Sometimes. Here an Important Scene Is Being Worked Over and the Director Is Acting Just as Though He Meant It

of advice as to position, character delineation and so on. Not much attempt is made at elaborate characterization in the first reading, although dialect parts are read with the correct pronunciation. Some actors write down in longhand the cues preceding their speeches, as this helps photograph the words on the memory. I know one actor who, on the first night in actual production, mentally turns the pages of his part book. Memorizing is really photographing on the mind that which is closely studied.

On the first morning Act 1 and Act 2 of the play are read, positions and business memorized as far as possible. The next morning the third act and then the first over again. Or if it is a four-act play, the last two are done. The actors then have the groundwork of the piece well in mind, know what it is all about; and while the thing may be more or less of a jumble to one unfamiliar with the game, those in it have the skeleton firmly in mind.

The next morning the players are supposed to be able to go on without leaning on the book too much and "do their stuff." Those having small parts, that is, only a few lines to speak, are expected to be fairly perfect. More latitude is allowed the leading man or leading lady who may have many long and difficult speeches. Strangely enough, it is often

the actor with hardly anything to do who needs the most coaching and who stumbles in his lines. Frequently the lead may go into his part with such firmness and power on this third morning as to be perfectly amazing.

Now we begin to see gestures given and to hear varying intonations given to the voice. In short, characterization is at work. The hero begins to feel the part he plays, to sense the role and to send out speeches and gestures in keeping with his part. The actor playing a bent old man may be around thirty years old himself, but his figure slumps into age and his voice quavers according to his idea of what a real old man's voice and actions should be. The wicked old skinflint snarls his speeches, the sweet young heroine gurgles and smiles, the juvenile snaps his words briskly and all the others do their parts according to their lights.

It is at this period that we begin, we outsiders, to see that there is some life to it all—some meaning. To be sure, everything seems dreadfully disconnected, the scenery missing, and the saintly minister perhaps smoking a pipe and wearing a passionate necktie. But for all that we actually begin to feel something under the spoken lines, a promise of things to come. This is the

(Continued on page 133)

◀ *The latest development for making radio even more useful*



When the President Speaks to Congress in the Future, the Boy Radio Fan—Even Out in California—Will Hear It Instantly

“LISTENING IN” ON CONGRESS

Radio Waves Are to Carry the Speeches and Debates of Our National Lawmakers to All Parts of the Country

by D. H. GERRY

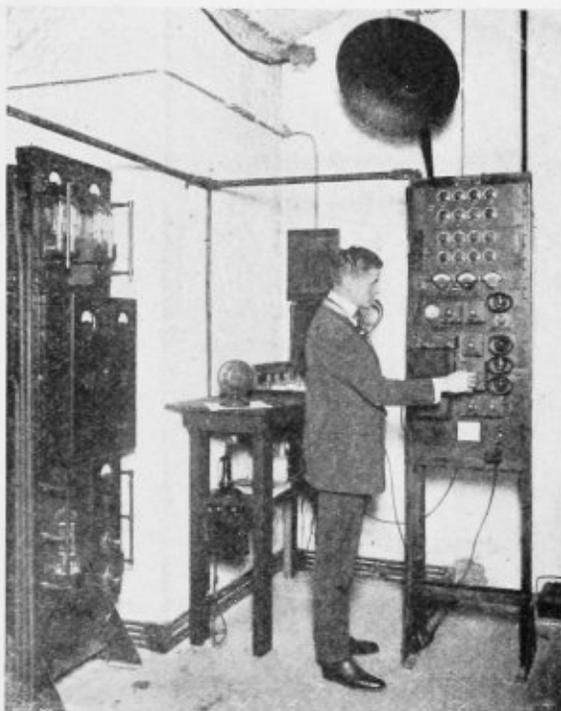
RADIO will soon be broadcasting the speeches of Congressmen and messages of the President directly from the floor of the House of Representatives to all parts of the United States as the result of the installation of sound amplifying apparatus at the Capitol and arrangements with the Naval Air Station at Anacostia, D. C. to pick up the orations over a silent telephone wire and to broadcast them to all parts of the country. Henceforward you and I may be in Florida, Maine or Oregon yet we will be able to “listen in” on the doings of Congress and the addresses of the President and hear them as distinctly as though we were sitting in the same

room with the speaker. Official count shows that our national lawmakers speak at least forty million words a year on the floor of the House so that their debates and controversies will always be available for flooding the ether with conversation when more important broadcasting is at a minimum.

At the time of President Harding's inauguration, a certain commercial radio company requested the privilege of testing out its sound amplifying apparatus for intensifying the voice of the new Executive so that all in the vast crowd of one hundred and twenty-five thousand people could hear every word he spoke. Official consent was given, the

concern installed its equipment and every auditor who attended the inauguration address ceremonies, even though he stood a half mile from the President's stand, heard clearly and distinctly what President Harding said. Later, the same system was tested out at Arlington when President Harding delivered his address in honor of the unknown soldier on Armistice Day, 1921. Recently, at the cornerstone laying of the new five million-dollar Masonic Temple in Detroit, more than two hundred thousand spectators grouped in a huge circle a half mile in diameter around the speaker's platform were able to hear readily as a consequence of the use of amplifiers. Experts say that the amplifiers will reinforce the speech to the extent that a crowd of one million people can hear the address of any speaker.

During the recent recess of Congress—after election the sixty-seventh Congress reconvened for its fourth session, this being the first time in our history that any Congress has met more than three times—radio equipment was installed in the House of Representatives which will revolutionize the potential circulation of information concerning what is doing in Congress. Henceforward, President Harding may be sick in bed or rushed with other work to the extent that he cannot visit the Capitol in person to deliver an address. From his White House executive offices or from his bedroom he can deliver his speech into a special microphone. A sound amplifier will deliver the message over a silent wire to the Capitol where it can be broadcasted throughout the House or to the offices of the individual congressmen. They will hear the message with the President's personal inflection and emphasis stressing the points which he wishes to bring out exactly as though the Chief Executive in person was standing before them. Furthermore, the message can be relayed on another silent wire to the Naval Air Station, where a very powerful broadcasting set

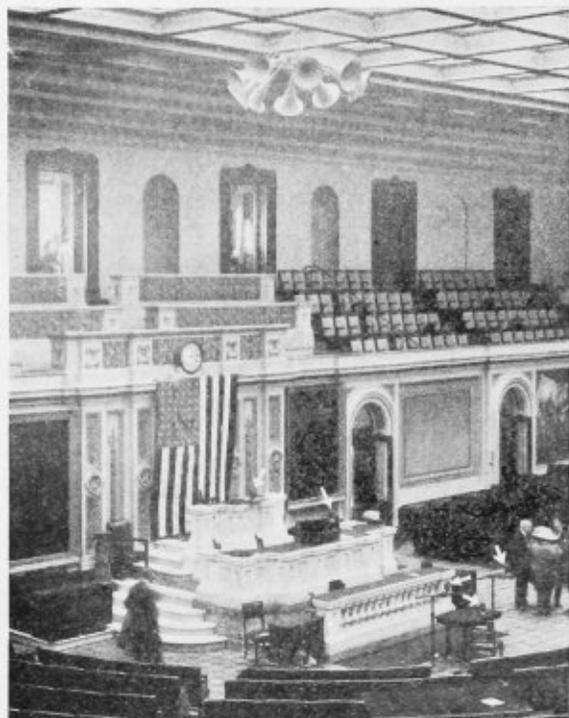


The Sound Amplifying Room in the Basement of the Capitol Where the Voices of Congress Are Sent by Silent Telephone Wire to the Naval Air Station Which Broadcasts Them Over the Country

is maintained by the Government, and thence disseminated in the ether to all parts of the country.

Under the opportunities afforded by the new system, the President not only will be able to address Congress from his home or office but he will be able to listen to what is going on in Congress constantly throughout the day. As soon as a certain speaker makes a statement or challenges any point brought out in the speech of some opponent, the President will hear about it. It is almost uncanny to think of the possibilities that are presented by the perfection of this new method of communication. Shortly, each congressman will have a radio outfit in his office. This will permit him to speak to his constituents away back in Iowa, Idaho or California most any evening and tell them just what he is doing and what is going on generally in the House of Representatives. There is practically no limit to the uses of the congressional radio equipment.

When the representatives first noticed



Sound Amplifying Horns Are Placed Throughout the House of Representatives. There Are Microphones on the Speaker's and Clerk's Desks and Three in the Speaking Pit

the sound amplifiers being installed in the House chambers, they thought that they were to be used exclusively to reinforce sound so that those in the galleries and at the uttermost limits of the room could hear plainly what each speaker was saying. Hence, the national legislators were greatly surprised on returning to the Capitol to find that the House was fortified experimentally to send its chatter to every remote district and hamlet in the country where powerful radio receiving sets are available to pick up the messages. In the future when the President speaks to Congress in person, the amplifiers will be used to distribute his voice so that everyone in the Capitol may hear him. All the visitors who cannot find room and seats in the House can repair to the Senate where the speech will be repeated by the amplifiers as distinctly as in the House.

There is some certainty that all debates will not be transmitted intelligibly enough for general broadcasting. This is because many of the excited orators in Congress neglect to stand within

eight feet of the microphone or transmitting device as they talk. The transmitters pick up the general debate and discussion from all parts of the House but the speech of speakers who stand far distant from a microphone is not made intelligible enough over the wire to bear of audible repetition over an area of several thousand square miles. Radio enthusiasts in Pennsylvania, Maryland, Virginia and the District of Columbia can pick up the news of Congress which is sent out directly from the Capitol radio headquarters. For greater distances, the broadcasting has to be performed through the national establishments at Anacostia.

Congress can now be brought to the fireside of every American whose home is equipped with a wireless outfit. No longer will it be necessary for visitors to travel a long distance to sit in awe and admiration and listen to the best oratorical talent of the country assembled at the National Capitol hurl barbed epithets and epigrams hither and yon.

There are now five powerful microphones in the House of Representatives. One stands on the Speaker's desk, another is on the reading clerk's desk, while the other three are located on the desks in the pit where the congressmen stand when making important speeches. Additional transmitters will soon be placed on the tables in front of the Republican and Democratic leaders. For amplifying the voices of the various speakers, a cluster of ten large horns has been placed above the speaker's desk while other horns have been installed in the press gallery, in the anteroom of the Rules Committee and in the office of the clerk of the House. Two radio experts operate the system. One works at the switchboard in the House gallery while the other keeps the apparatus properly tuned up in the basement office.

The present experiments at Washington are the most extensive and unique that have been attempted in the history of modern radiography.

PALESTINE—OLD *and* NEW

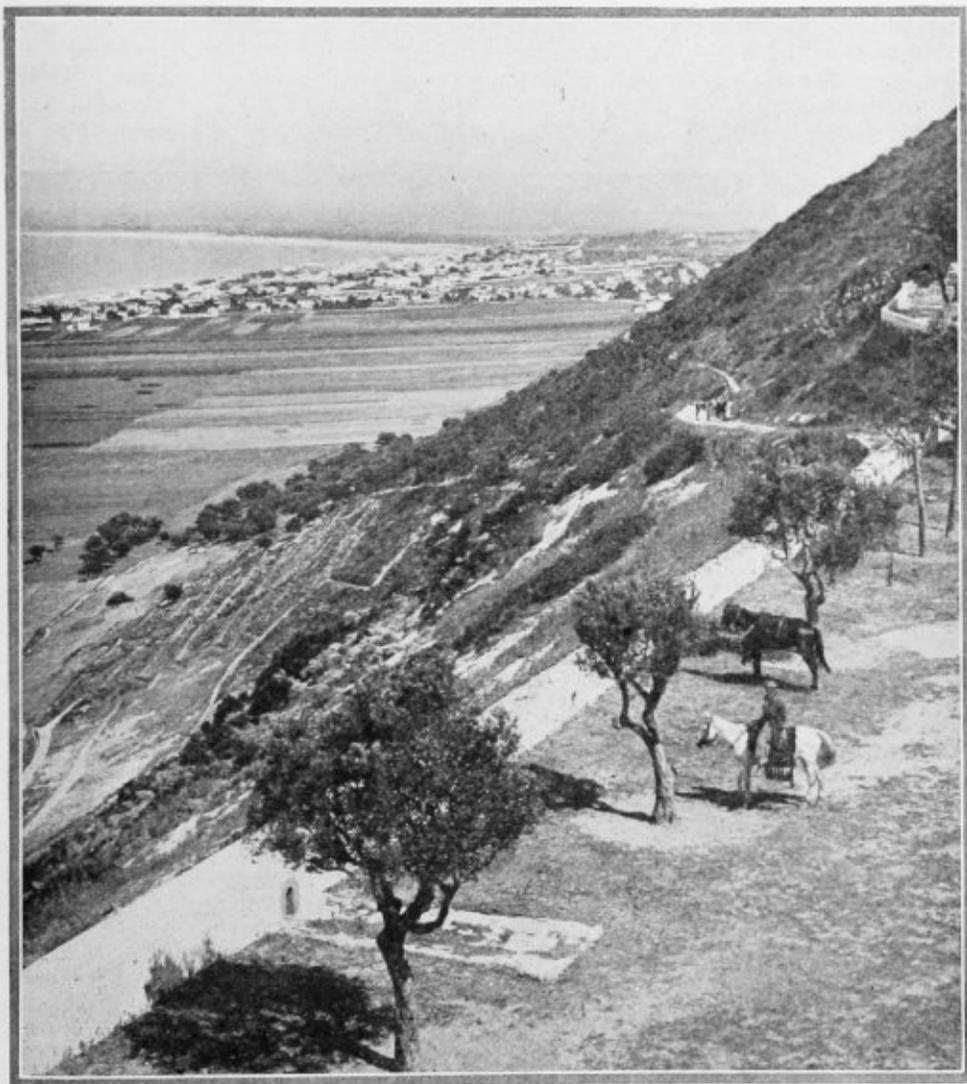
*Freed from the Yoke of the Turks and Mohammedanism, the Holy Land Is Progressing.
Rev. Dushaw Has Recently Returned from an Extensive Tour of That Country
and Herewith Gives an Excellent Description of Its Recent Developments*

by AMOS I. DUSHAW

FIRST FOUR PHOTOS © UNDERWOOD & UNDERWOOD

FOR its size, about that of the State of Vermont, Palestine is a most interesting land. It is the Holy Land for Jews, Christians and Mohammedans. It gave birth to ideas which have had

a tremendous influence in the transformation of nations from savagery and barbarism to the most highly cultured and civilized nations of all time. These ideas are still the priceless heritage of



Looking East from Mount Carmel Towards Haifa on the Bay of Akka. This Town Is One of the Largest Ports in the Holy Land

these advanced nations and are still exercising a potent influence for good. With classic Greece and Imperial Rome, Palestine is the source of our modern civilization. Over its hills, valleys and plains the leading nations of ancient and modern times have battled many times for the political supremacy of the world. The Assyrians, Babylonians, Egyptians, Scythians, Israelites, Persians, Greeks, Romans and, during the crusading centuries, soldiers from every section of Europe came here to battle against Islam in defense of its sacred places. During the late war Palestine was once more the battlefield of the world for soldiers from Turkey, Austria, Germany, Great Britain, Australia, India and America.

Changes are being brought about in Palestine as a result of the World War since the country is no longer ruled by the Turk. Under British rule Palestine is freed from the vicious influence of a backward nation and given a chance to breathe once more the air of freedom and to develop in commerce, education and government.

The average tourist who comes to Palestine from the most modern sections of the Occident is generally disgusted with its backward state, its poor harbors, ugly cities and villages, streets littered with rubbish, foul odors, dark, narrow and tunnel-like alleys. This is old Palestine, that of the middle ages and the Turk. The task that confronts the reconstructor is indeed colossal. The

situation is more difficult than that encountered by the pioneers in New England and in the Northwest. It is not simply a matter of building, but first of destroying and removing the accumulations of rubbish and filth, and creating a desire for better things in the hearts of the natives of all classes who are perfectly satisfied with things as they are. That the task is not altogether hopeless is evidenced by the achievements of the German and Jewish colonists even during the days of the Turk when these noble pioneers had to battle against Turkish graft and misrule.

Nature has in some respects been rather ungenerous to Palestine. On the

south is a Sahara-like desert which separates it from Egypt, on the east is the famous gorge, on the north are the mountains of Syria, and on the west is the almost straight coastline, with only two poor harbors. These harbors are in the same condition they were in prehistoric times, and are inaccessible for weeks at a time in winter.

The principal port is Jaffa. Its ancient name is Joppa. Nature

has done its best to keep this thriving town, ideally situated as far as climate, scenery and fertility of soil are concerned, from being reached by friend or foe with any measure of ease. The rocks stand out as guardians, battling defiantly against the choppy waves of the Mediterranean Sea as they lash the shores without mercy. The old Greeks



Pilgrims from Egypt Bathing in the Holy Waters of the River Jordan. This Biblical River Will Be Changed to a Useful Body of Water by a Dam Which Will Make It into a Light and Power Supplying Hydro-Electric Development

believed that to one of these rocks Andromeda was chained and saved by Perseus from the savage and hungry sea monster.

This mythical tale aptly describes the port which, in historic times, was associated with the work of King Solomon when lumber was shipped by Hiram, king of Tyre, for the great temple at Jerusalem. Not long ago, lumber was brought in from Norway, Roumania and other lands for the new homes in the New Palestine. Jaffa was stormed and taken by the Maccabean warriors, by Richard the Lionhearted and by Napoleon Bonaparte. Progress of the fifty thousand inhabitants—Moslems,

Christians and Jews—is as backward as it was in the days of Richard and Napoleon. However, Jaffa has been promised a modern port. It deserves one, because from the luxurious gardens surrounding it are shipped forth annually more than a million boxes of oranges to all parts of Europe.

Adjoining Jaffa, a little to the north of it, formerly a part of it but now an independent municipality of about eight thousand inhabitants, entirely Jewish in population and government, is Tel Aviv, an exceedingly interesting, progressive and thoroughly up-to-date settlement. Tel Aviv looks like a suburb of Los Angeles and is the pride of Palestine. Less than twenty years ago this spot was a bit of sandy, worthless land, a part of the beach. Today it has modern homes,

broad streets, a beautiful park with tropical trees and plants, a public library, many schools, stores, restaurants, theaters and all conveniences to make a resident from the West feel comfortable.

The place is blessed with a good water supply and electricity for the streets and homes.

About a mile to the north of Tel Aviv is Saron, the well-known German colony, also modern in many ways, and a real contribution to the country. The Germans have a number of such colonies in Palestine, and their colonies at Jerusalem and Haifa are an honor to the heroic efforts put forth by these pious, and hard-working Germans. They

believe "Cleanliness is next to godliness."

Palestine was at its best when it was largely Jewish in population and culture, and it is once more coming to the front largely through the influence of the Jews. Their modern invasion of the country is not by means of great armies, and they are not damaging the economic interest of the natives. On the contrary their coming is a blessing to the land and people. They are conquering the waste places by means of scientific farming and schools, technical and agricultural. They have the best and most modern technical and agricultural schools, as well as other schools, elementary, normal, art, music, etc. Their great technical school at Haifa will give the country the mechanics it needs, and the agricultural school,

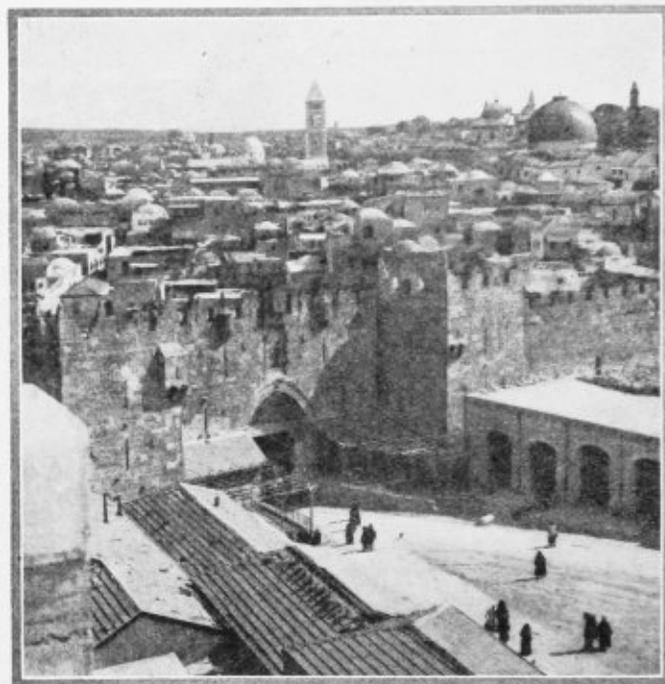


A Present-Day Scene in the Little Town of Bethlehem Where Our Lord and King David Were Born

"Mikveh Israel," is already giving the country its scientific farmers. The latter institution is located on the Plain of Sharon, about two miles from Jaffa. The

munity spirit is lacking. They have shown the mutual advantages of fraternal cooperation.

This colony, located about twelve miles from the city of Haifa and within sight of the sea and Mount Carmel, is a little over forty years old. It has nearly two hundred homes with a total population of fourteen hundred. Between the colony and the station is a fine plain, part of which is used for orange gardens, known as the "Baron's Gardens," in honor of Rothschild. Before reaching the main part of the colony I passed through a lover's lane of eucalyptus trees, shady and cool. About five minutes' walk from here was the heart of the settlement. The houses, situated in the midst of orange, lemon, fig, olive and pomegranate trees, gave one the impression that its inhabitants could not possibly long for the ugly, congested



The Damascus Gate in the North Wall of the City of Jerusalem. The Spire in the Center of the Picture Is That of the Church of the Holy Sepulchre

establishment is a marvel of skill and culture. The instructors are graduates of some of the leading European and American agricultural schools. The pupils are mostly the sons of Jewish colonists who settled in Palestine about a generation ago and who, in the face of many difficulties, have conquered the barren soil and made it productive. These pupils receive a three-year course in scientific farming.

It was on a warm July day that I visited the exceptionally progressive colony of Zichron Jacob. I use the word progressive because many of the social problems that confront our small towns have been handled here with rare skill and success. These colonists do not call themselves communists or socialists and, without destroying private initiative, have saved themselves from the sad results to be found wherever the true com-

ghettos of Europe and America. I soon discovered that the first impression was correct.

The colony has one large synagogue and one rabbi who is at the service of all. I mention this fact because Rischon Le Zion, another first-class colony has three synagogues, and one of them is the "Worker's Synagogue." Zichron Jacob colony has one large school with several able teachers. The classrooms are spacious and light, and in the same building is a large assembly hall for public use. The colony also has a kindergarten, a beautiful park with tropical trees and plants, a community bathing establishment, a Mutual Loan and Cattle Insurance Society, and a community hospital which with its spacious grounds and splendid equipment is the pride of the colony. In a word, the colony is organized to take care of all of its needs,

economic, social, intellectual and spiritual. The inhabitants of this colony, like the other colonists, are all-around farmers, but they have specialized in fruit culture, largely for foreign trade. This colony and Rischon Le Zion have the two largest wine-cellar in Palestine.

These colonies may truly be called the outposts of Occidental civilization. In fact, the future growth of Palestine is bound up in these Jewish efforts to reclaim the country, free it from its

swamps with their breeding places for the malaria-carrying mosquito—the perennial scourge of the country. Palestine has the climate, the soil, the location and scenery. What it now needs is a wide-awake people, with western ideas and capital to make of it a land worthy of its noble past and the interest which it still commands for the many in Europe and America. From now on Palestine will make more rapid progress because

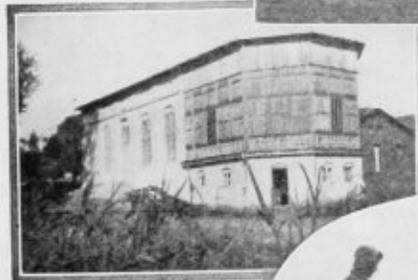
(Continued on page 132)



Above—New Method of Road Building in Jaffa.
Below—Community Center at the Colony of Rischon Le Zion



Above—The Jaffa Road in Jerusalem
Below—A New Style of House as Seen in Tel Aviv



Below—A School Building in the Colony of Zichron Jacob

Above—Jaffa Is the Leading Port in Palestine



Left—Pupils of the Jewish Agricultural School, "Mikveh Israel"
Below—Synagogue and Children in Zichron Jacob Colony



Is Your ELECTRICAL

Another Article of Mr. French's Vocational Series in Which He Points Out What Qualifications Are Needed to Succeed in the Various Professions

civilization. Its performances have actually exceeded the reach of imagination—and those best informed tell us we may expect even greater electrical development in the next half century.

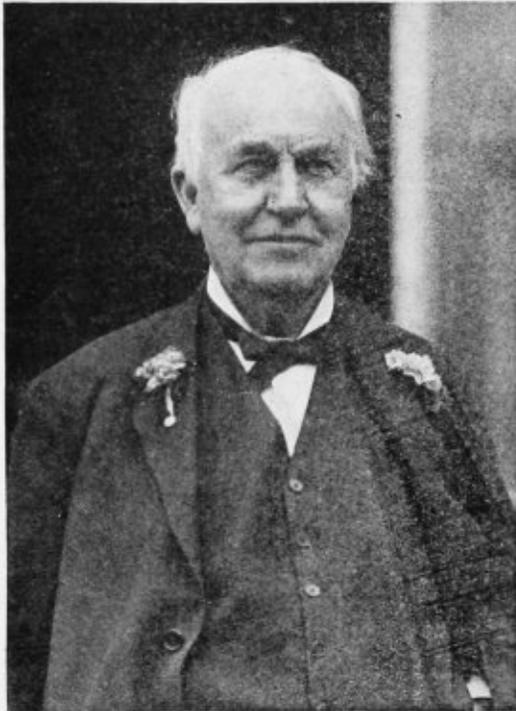
Whether this prediction has foundation in fact or not, one thing is certain: The expert in applied electricity will not want for work within the next fifty years or more; and the electrical engineer with vision to see new ways to utilize this miracle power and the scientific and technical skill and knowledge to turn that vision from an *idea* to a practical, workable *reality* will find the whole world a mart in competition for his services or

his product.

But now what of this profession? What of its requirements and its rewards? What it may offer in fame you already know—for the names of Edison, Lamme and Steinmetz are familiar to every household now. Edison is an inventor, Steinmetz a chemist and Lamme a mechanical genius—and still they are named as the world's greatest electrical engineers.

There you have the secret—and the information that will discourage you from attempting the almost limitless study and research necessary to gain even a footing in this ultra-scientific and technical calling or else inspire you to a determination to develop yourself to a degree where you can be admitted to this exclusive and valuable profession.

Why is it that the electrical engineer may branch out as a chemist, a designer, an inventor or a radio expert? Why, too, may he be called to supervise the



What Fame and Fortune Does the Profession of Electrical Engineering Hold? The Name of Edison—Edison, the Electrical Engineer, the Inventor—Is Known to Everyone All Over the World

NO profession offers the young man of today greater opportunities, a wider range for development or more substantial rewards than does Electrical Engineering.

In spite of the miracles it has already accomplished, despite the new industries it has created and despite its entrance into almost every line of human endeavor, electrical engineering is perhaps the youngest of all the scientific professions—and is still in its infancy.

Because of this and because electricity is recognized as the great power of today and of tomorrow, the field for the scientific electric worker is not overcrowded. It is far from that. In fact, the supply of workers with a scientific education in any branch of Electrical Engineering is far below the country's requirements—and the whole world is bidding for American electrical genius.

In the past fifty years electricity has accomplished almost untold wonders for

Future In ENGINEERING?

by

WILLIAM F. FRENCH

work of any or all of these technical experts?

Because the electrical engineer, as the title means in the great electrical concerns, is the expert in all lines of electricity. He may be likened to the practical, scientific general manager or consulting expert to a half hundred different lines of work. He is the expert general practitioner of electricity. The others are merely specialists—likely helpless out of their own particular branch of the science of electricity.

So do not confuse the "Electrical Engineer" of the giant electric works with the "Electrical Engineer" turned out by college or school. The electrical engineer in the latter case is merely someone who has finished a course in the basic principles of electricity and who in all probability must specialize before he finds his real niche in the industry. For the purpose of this article the phrase "Electrical Engineer" refers to the expert in charge of the big works, not to the college graduate with the degree of "Electrical Engineer."

The training of the electrical engineer includes a knowledge of the practical work of the ordinary electrician, a skill in drafting, a thorough drilling in mathematics and physics, an understanding of chemistry, a practical working knowledge of mechanics and more than a smattering of geology and commerce. He may need more than a little knowledge of applied hydraulic engineering before he is done. And what he learns of physical personal efficiency and metallurgy will not be lost in his work.



Benjamin J. Lamme, as a Boy, Chose Engineering as His Life Work. Today He Is Rated as One of the World's Best and Is Chief Engineer of the Great Westinghouse Electric and Manufacturing Company

A formidable preparation without doubt; but necessary, as the high-grade electrical engineer may be called upon to solve problems that have defied the combined efforts of mechanical engineer, radio expert, telegraph or telephone expert, inventor, efficiency engineer and business genius.

Yes, the road is long and the path is hard—but so it is to the top of any profession, and the electrical engineer stands at the very pinnacle of his profession. One may be called a lawyer and stand at the bottom of his profession; or a doctor and have little to show his patients besides a diploma; or a banker and squeeze out a miserable existence as money-lender and insurance agent; or an actor and never get "back-stage" in a real theater; or a writer with never a published manuscript, but the title "Electrical Engineer" belongs only to those who have won it by real accomplishment.

And what hard, cold cash rewards come to the electrical engineer? Well, we must remember that is like asking what rewards the top-notch lawyers, artists, writers, business men or baseball players receive. There are no set amounts. The successful man in any line gets as much as he can reasonably need and usually has plenty left over for luxuries—and the electrical engineer is the successful man of the electrical industry.

Perhaps the words of an official of one of the world's greatest electrical concerns will prove interesting in this connection:

"What's a first-class electrical engineer worth? Well, we figure it costs us about twenty-five thousand dollars to develop one and that we get our money back the first year he actually produces. If we were hiring them in the open field I'd say a good one would be worth twenty-five thousand dollars a year or more. As for a man like Lamme or Steinmetz—no one can put a price on such brains."

In this official's statement we find an interesting point—the big electrical concerns figure an electrical engineer has to be "developed," not hired. Of course one electric manufacturing or specialty company may hire an electrical engineer away from a competitor, or a newcomer in the field may have to draw upon some of the old established concerns for its electrical engineers but, as a usual thing, the men who are electrical engineers today were hired by their present employers as much less important cogs in the great machine of scientific industry and developed, trained and promoted to the positions they now hold.

All of which should be pleasant music to the ears of the ambitious young man with the technical twist—for it guarantees that there is always a place at the top of this profession for the worker who is willing to climb up there through intelligent study and hard work. It is also assurance that an expensive college course and post-graduate training is not the door through which the average electrical-engineer-to-be enters his profession.

As a matter of fact, practically all the great electrical concerns of the country maintain their own schools and train

their workers for the expert knowledge and work that they will eventually require of them. The schools maintained by the Westinghouse Electric and Manufacturing Company, the General Electric Company and the Western Electric Company are among the finest technical training schools in the country. Hundreds of thousands of dollars a year are spent in maintaining them.

Scholarship in these schools does not go begging, however, and the young electrician who hopes to be enrolled in one of them will do well to remember that he will first have to show that he has the right foundation upon which to work; the strength of character necessary to carry through the extensive and intensive work and study required of him; the natural aptitude or "makings" of a technical man; a clear knowledge of "why" he wants to be an electrical expert and a willingness to "pay" his way through by hard work and close application.

While with some of the larger electrical companies a technical college education is highly desired and with the others the completion of high school is required, it is very, very seldom that a student-employee, or an applicant for position of student-employee, is denied admittance because he lacks college or high school education if he has secured its equivalent elsewhere.

In other words, it is the education, the net knowledge—not the diploma—that the educational heads of these industries are looking for. They expect the equivalent of a high school education at least, and the more efficient the applicant is at mathematics, physics, drafting and chemistry the more welcome he will be.

In this connection it may be well to point out that the training secured by those who have completed courses in "electrical engineering" in colleges, correspondence schools or by independent home study fits one perfectly to carry on with the big institutions—for such courses furnish a thorough grounding and really equip one to earn a very substantial income from the application of their teachings alone, if he does not aspire to the heights. The earning power of a conscientious, intelligent worker who has finished such a course will range



The Big Keokuk Dam on the Mississippi. What a Chance for the Electrical Engineers When These Big Hydro-Electric Projects Spring Up in Every Section of the Country

from three thousand to eight thousand a year, depending upon his practical experience.

To the more ambitious, however, this training will be but a stepping-stone. For, after all, it is the work you do after you leave school that counts most—and many a young worker in the plants of these great concerns (and outside of them, too) has educated himself at home to a point where he proved acceptable for admittance to their training schools.

I know of a case of one strong-headed youngster who had quit home at the age of fourteen. He chose a laboring job rather than go to high school, and, at the age of eighteen, came in contact with a student-employee in one of the large electrical manufacturing concerns.

Straightaway he went to the educational director of that organization and asked to be enrolled. When that individual learned that the new applicant had never finished his seventh year in common school and had been doing ordinary unskilled labor ever since, he shook his head sadly:

"Not a chance, young fellow—not a chance! You may have taken a liking to our nice, shiny machinery and to the work your friend is doing, but that doesn't qualify you so far as we are concerned. You should have thought of

that before you quit school. I am sorry, but there are too many who have taken advantage of their educational opportunities applying to us to justify our taking on as rough a diamond as you seem to be. I hate to disappoint you, but you've too much to learn before you could interest us for me to offer any encouragement."

The educational director thought no more of the lad, until, perhaps two months later, he recognized him in one of the hundreds of laborers about one of the big plants. He remembered him, but attached no significance to his appearance in the plant, as laborers were constantly shifting from one line of work to another.

Three months later he saw him again, this time holding a minor apprentice job in the insulating department. He called a foreman to one side: "What's that red-headed chap's name?" he asked.

"Roody Grogan. First name's Rudolph. Father's peppery Irish and his mother's rotund Dutch. Irish and German—he's a hot sketch—but a relentless worker. The Irish in him starts something and the German sees it through. You'll be hearing from him, one day."

Nor was the day far distant, for within a year after his dismissal from the edu-

(Continued on page 154)



Nothing Soft About This Job. This Cameraman Had to Ward Off the Angry Eagle While Trying to Make a Movie of Its Nest

DARE-DEVILS of the MAGIC BOX

¶ *Every Day the News Cameraman Takes His Life in One Hand and His Camera in the Other and Sees What Fate Has Up Her Sleeve*

by ARTHUR LESLIE

YOU catch your breath—a lump comes in your throat—your hands grip the sides of your chair convulsively—while cold chills chase up and down your vertebrae—you have forgotten that you are in a movie theater.

Your eyes are glued to the screen for the news reel is being shown, and you pulsate with the throb of reality as a particularly dangerous feat, a fire or a big news happening flashes across your vision with an appeal so intense as to fairly lift you out of your seat.

Of course, such a moment of ecstasy does not occur every time you visit the movies. The rarity of it is what enhances it. We have not yet ceased to react to those exciting scenes snatched from real life that are thrown on the screen in all their vividness. As the picture passes before you, you are left wondering how the cameraman was able to catch it.

While looking at the human fly who is climbing over the wings of a zipping, zooming, nose-diving airplane several thousand feet in the air, you know instinctively that another plane carrying the cameraman must be duplicating these gyrations.

As the wall of a blazing factory falls outward, you quiver with suppressed excitement, but do you think of the news cameraman who is grinding away, while the falling bricks crash around him and his face and hands are being scorched by the flames.

Perhaps a whole city is burning and the fleeing, fear-crazed inhabitants trample on the cameraman in their mad rush for safety. Then again a real riot is being shown on the screen. The news cameraman is the center of flying missiles—the rocks are real honest-to-goodness rocks and not made of *papier maché* like those employed in a made-to-order riot on a studio set. But why generalize? The public has always thirsted for details. Now they can be told, because the news cameramen have at last been induced to break through that wall of silence that hid from you the valor of their exploits. They have hitherto always preferred to be known by their work. They are as ethical in their reticence as a physician.

While the ashes of Smyrna were still warm, one news reel flashed on the theater screens a complete motion picture report of the frightful scenes of the first great conflagration in the Turkish invasion of Europe. Exactly two weeks from the date of the Smyrna holocaust which shocked the civilized world, the pictures were rushed through the air and over six thousand miles of ocean and land.

In achievements of this kind, interest naturally centers in the man who overcame all obstacles in a race against time, in a war-ravaged country, to be on the scene when the thing happened, to do his work and transmit the result with all possible swiftness. In this extraordinary instance the man was George Ercole, with a roving commission in Central Europe. His boss, Emanuel Cohen, Editor of Pathé Weekly, shares the credit for this, the biggest feat of recent years.

What can words add to the revelations of a motion picture? George Ercole is no exception to the rule of self-effacement which all cameramen follow. His communications to his editor in transmitting his Smyrna films contain practically nothing about his personal experience.

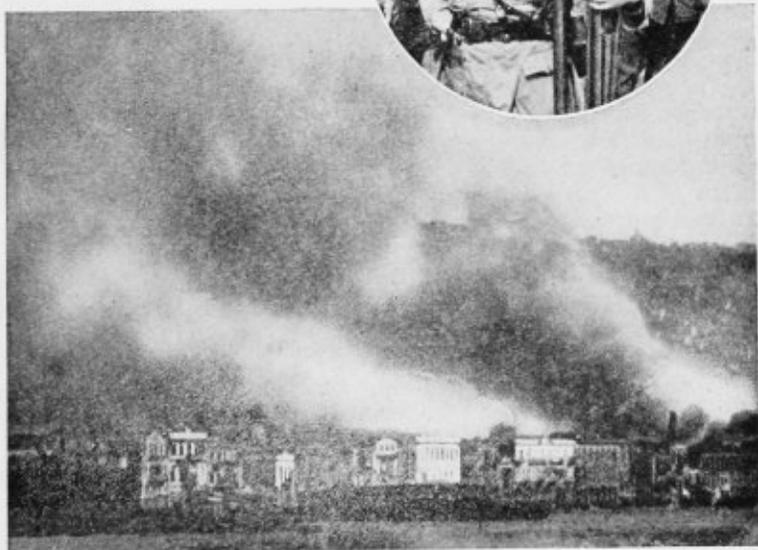
Ercole's sensations, and the personal perils he encountered in "closeup" cranking of his camera, in streets crowded with frantic Christian men, women and children trying to reach the waterfront and escape in ships, can only be imagined from the moving scenes transmitted to the picture screen.

L. C. Hutt, another dare-devil of the magic box, on the staff of Editor Cohen, was recently ordered to "take" the stunts a professional acrobat was to perform in midair. This performer was a trained athlete. He held on to the aeroplane with two hands and two legs as he climbed over the wings. It looked dangerous, but for the professional acrobat it did not require unusual courage. When the plane on which he had done his human fly act came to a rest on the landing field, his hand was grasped by a multitude of ad-

mirers, who carried him off on their shoulders. Later, when the film was shown on the screen, the people in the audience marveled at the intrepid adventurer on high, who was ready to meet death with a smile on his lips.

But the real hero of the picture was not in the picture at all. Hutt had been up in a plane before, but had never left the safe confines of the cockpit, where, belted in, he had taken pictures of the city below. His muscles were not especially trained for climbing around a moving airplane or preserving his balance in mid-air, but the assignment was all in the day's work, so he accepted the risk cheerfully, only hoping that the atmosphere would be clear and that the film would not buckle, as a retake was impossible. He therefore hooked his leg around a strut and was ready.

In following the gyrations of the plane on which the acrobat was performing, the plane that was carrying the camera-



Getting the Movies of Smyrna in Flames Was a Feat That Required Nerve and Quick Action. In the Circle Is George Ercole Who Got the Films



The Little Figure on the Ledge Above the Big Clock Is L. C. Hutt, Who Refuses to Be Photographed. His Act in Continuing to Grind the Camera After Losing Three Fingers Is Considered One of the Bravest Feats Ever Performed by a Cameraman. In the Oval Is Charles Prettyman on Mount Rainier. He Was the First Cameraman to Scale This Peak and Nearly Lost His Life Doing It

man was also obliged to go nose-diving and somersaulting. Hutt, after a few moments, in some inexplicable way got his left hand too close to the propeller. Yet, after losing the fingers, he continued to grind with his right hand. He kept this up steadily until the first plane alighted. Then Hutt jumped into a car and was taken first to the laboratory, where he gave hurried instructions for the developing of the film so that it would catch the first afternoon train for the East. He had wrapped a handkerchief around the injured hand so that his associates would not bother him with questions until his film was in the developing room. Suddenly he fainted from loss of blood. He was rushed to a hospital and his life despaired of because such quantities of blood had drained out of the severed fingers.

When H. D. Blauvelt made his first coast-to-coast pictures of the Panama Canal, people who witnessed them on

the screen of their favorite theater said "How interesting"—not knowing that he had literally taken his life in his hands, as the air currents above the canal are considered almost impossible to navigate. The same element of danger existed when a cameraman flew over the Grand Canon grinding away. The currents and cross currents between the narrow walls created atmospheric whirlpools which threatened to dash the pilot and cameraman to instant death.

One of the most adroit feats in photographing forbidden scenes was accomplished by the news cameraman of the Pathé company during the Carpentier-Dempsey fight at Boyle's famous Thirty Acres. Tex Rickard refused permission



to all news cameramen, as he had his own photographers present and expected to reap a fortune from the exclusive presentation of the fight films. But the public must be served. To quote a dictum of the inexorable law of demand, "The show must go on." Therefore the cameramen hired the roof of an adjoining factory which overlooked the arena. Although they paid for the privilege, when they went to take possession they found policemen on the roof. The arbitrary minions of the law waved them aside and seized their cameras.

But the foresight of the cameramen saved the day. Early that morning, before the police were on the job, they had stationed two of their number with telephoto lenses, known as "Long Toms," in advantageous positions. One was

ensconced in a large wooden water tank which had been drained and had a hole bored through the side, while another poked his lens out of the window of the janitor's closet on the top floor. The cameramen on the roof expected to be ousted. They were only camouflaging the hidden operators. The law does not forbid the transportation of the preliminary scenes attendant on a prize fight, and all these scenes were taken and shown that very night on Broadway. The cameramen had been perfectly willing to run the danger of arrest.

Every day the news cameraman takes his life in one hand and the camera in the other and sees what Fate has up her sleeve. The ones in the headlines are not always those who do the big things. To the news cameraman the whole world is his oyster, the heavens above and the waters beneath, from the airplane to the submarine.



They Do Some Queer and Perilous Things. The Tiny Figure on the Little Platform Being Hoisted in the Air Is a Fearless Cameraman

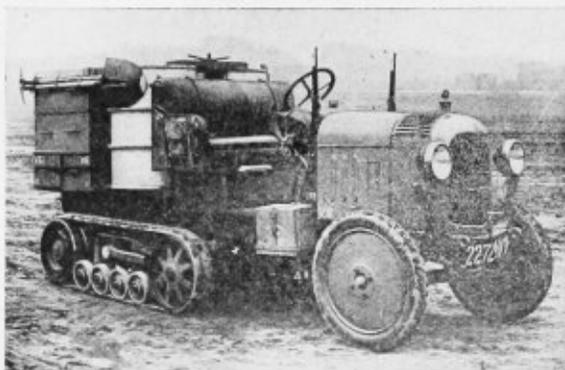


While Making a Motion Picture of a Break in the Levee Along the Mississippi the Cameraman Was in Constant Danger of Being Swept to a Wet Death

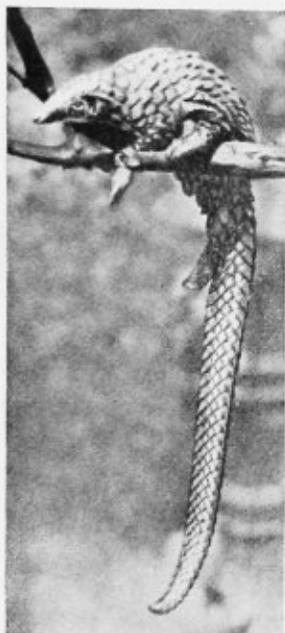
The possibility of getting shot never deters a news cameraman. The possibilities of getting a "shot" at some celebrity appeals to his lust for adventure. There was C. J. Kaho, who, under the guise of making a picture for a harvester company that had just sold Francisco Villa, the Mexican bandit, a tractor,

penetrated to the fastness presided over by the man with the price on his head. Convincing the guards that he worked for the harvester company and wanted only to picture the machine at work, he set up his camera saying he wanted to make what is known as an industrial picture. He was expressly forbidden to take pictures of the bandit owner. He took Villa at the first opportunity. Villa had him seized and lined up against a wall with carbines pointing at his breast. Kaho, when asked if he had any farewell message to be sent back to the States, said, yes, that he would like to destroy the film of Villa so that no one could smuggle it out of the country, inasmuch as Mr. Villa seemed to dislike the idea of its being shown. Villa was actually touched at this solicitude for his wishes and ordered that Kaho be released. The latter thereupon destroyed the wrong piece of film, and returned to the States with the first pictures of the bandit amid home surroundings.

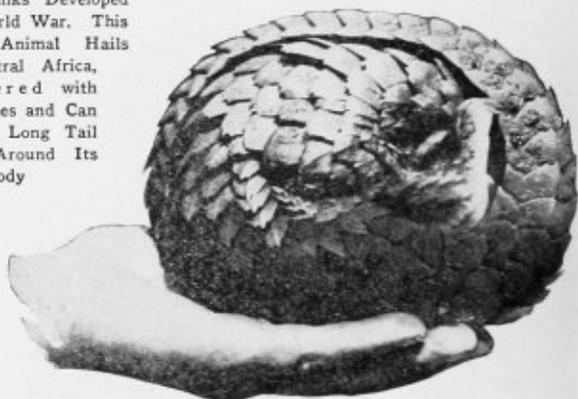
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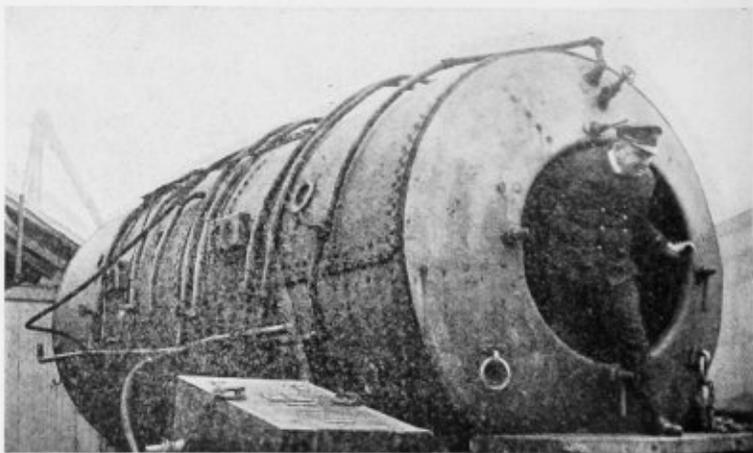
Maybe the Camel Is Going to Lose His Job. An Attempt Is Being Made to Cross the Sahara Desert in Automobiles. At the Left Is a Close-Up of the Machine with Its Wide Caterpillar Treads Which Do Not Sink in the Sand. Below, the Caravan in Transit



The Panjolin Is Probably the Originator of the Idea of the Tanks Developed in the World War. This Peculiar Animal Hails from Central Africa, Is Covered with Thick Scales and Can Wrap Its Long Tail Entirely Around Its Body



The "Bends" Ailment, Caused by the Compressed Air Necessary for Working in the Vehicular Tunnel Under the Hudson River, Can Be Cured by Placing the Patient in This Huge Compressed Air Tank and Giving Him Exercise While reducing the Air Pressure to Normal



GUARDING THE COUNTRY'S CROP REPORTS

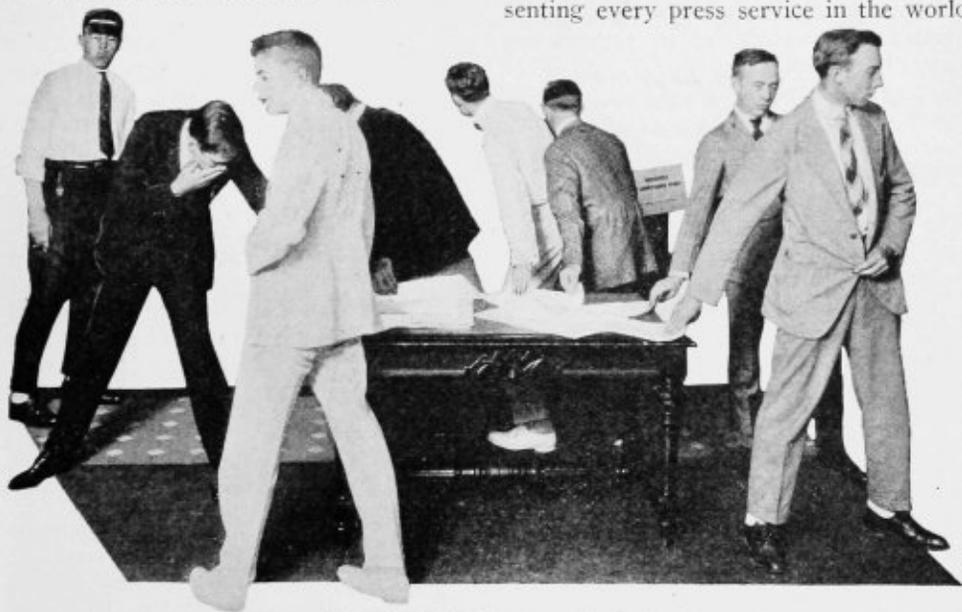
It Is Essential That No Information About These Government Bulletins Leaks Out Even a Minute Before They Are Ready to Be Made Public. The Method of Compiling and Broadcasting Them Is Extremely Interesting

by

CROP reporting days are big events on the calendar of the Washington newspaper men, as on these occasions Uncle Sam makes public all the latest information on the condition of crops and live stock in all sections of the country and the prospects for potential agricultural prosperity. The greatest

GEORGE H. DACY ing millions of dollars by taking advantage of

the non-informed on the stock market. Releasing the Government crop reports is one of the most interesting occurrences which monthly takes place in the National Capital. The information is given out absolutely on the stroke of the clock. A large number of news writers representing every press service in the world



Newspaper Men Wait Around the Table Until the Mimeographed Copies of the Reports Are Set Down and the Clock Strikes. Then They Run to the Nearest Telegraph Instrument with Them

secrecy is maintained in the assembling and compiling of data which forecast crop conditions. Nobody, not even the statisticians and crop experts engaged in the work, knows what the report will be until a few minutes before it is made public. If these safeguards were not practiced, gamblers and speculators might obtain premature and inside information about the condition of the countrywide corn, wheat and cotton crops and utilize this knowledge in mak-

gather in the anteroom adjoining the chamber where the Board of Crop Estimates is busy compiling the final figures. The Secretary of Agriculture crosses to the chamber and examines and approves the report shortly before it is released. Then mimeographed copies of the report are brought into the anteroom and placed face downward on a large table. Each newspaper man is allowed to step forward and grasp one of these reports. With the first peal of the clock, he grabs

up the paper and races to the nearest telegraph instrument and begins to flash the news to the papers he represents. Adequate telegraph facilities are provided so that all the journalists can send out their stories directly from the offices of the Department of Agriculture. Some of the reporters telephone their stories to down-town telegraphers who speed the stories out over the wires. It is the most spectacular race which is staged between the rival writers of Washington to see whose paper will receive and publish the crop report first.

Thirty minutes after the experts of the Bureau of Crop Estimates have finished their figures and ratified the report, it is in the hands of the Government Printing Office, several miles from agricultural headquarters, ready to be officially printed and distributed to agricultural experts, scientific societies, libraries, newspapers and state and federal agents in all parts of this country. The report on cotton is given out promptly at eleven o'clock in the morning. The report on corn, wheat and other grains is released at half past two in the afternoon, Washington time, the hour when the Chicago Board of Trade officially closes. During the last ten years, there have been only two occasions when Uncle Sam was a

few minutes late in releasing this news. Once a duplicating machine broke down and delayed the report. Another time, Congress ordered that a special survey report be issued simultaneously with the monthly crop report. The agricultural statisticians were a little late in announcing the figures due to being overburdened with additional work.

Every stock market in the country awaits anxiously the first news of the

latest tab which Uncle Sam has made of his crop debits and credits. One time the New Orleans Cotton Exchange was temporarily aroused to a state bordering on riot and turmoil because the crop reports were exactly twenty seconds late in reaching that point. It so happened that one of the stock brokers was standing directly behind the telegraph operator who was to receive the crop news from Washington. At approximately the appointed hour, this broker noticed the operator write down a certain figure on a pad of paper. He saw what the figure was, assumed that it was an official report from Washington about the cotton market, dashed madly in on the floor of the Stock Exchange and began selling. His associates, sensing what was up, did likewise. Confusion and riot reigned. Then suddenly the

telegrapher appeared with the true report. A number of brokers were almost bankrupt as a result of their impetuous actions and snap judgment. What the telegrapher had written on the scrap of paper was his guess concerning what the figure wired from the Capital City would be.

Though millions of dollars could be made on certain occasions if speculators could secure "tips" and advance information regarding future

crop reports, there has not been a single case of dishonesty in the crop reporting service since 1905. That year a trusted Government employe gave out advance information to a group of speculators who cleaned up a large amount of money by "playing the tip." Subsequently, during the trial of the offender, it developed that his share of the profits from one of his shady investments amounted to seventy thousand dollars. He was inter-



There Are a Quarter of a Million Volunteer Crop Reporters in All Parts of the Country Who Aid Uncle Sam in Keeping Tab on His Eighty Billion Dollar Farming Industry



The Board of Crop Estimates Working in Secret Session Preparatory to Releasing the Crop Reports to the Representatives of the Press Who Will Broadcast Them to All Parts of the Land

ested in a great number of similar "fliers." He was only fined five thousand dollars for his misplacement of confidence, as there was no official law which applied to his breach of trust. Immediately thereafter, Congress passed a specific statute which makes it a statutory offense for any of the two hundred Washington employes of the Bureau of Crop Estimates to play the stock market, to give out advance information about any of the crop reports or to circulate false information. The punishment for violation of this law is a fine of ten thousand dollars and not over ten years' imprisonment, or both.

The Government crop reporting service even antedates the Department of Agriculture as it was started in a small way some years before the Mexican War. Several men in the Patent Office then had charge of the work. Congress annually appropriated a small amount of money for the study of crop conditions and the survey of general agricultural information. As early as 1839 our legislators appropriated one thousand dollars for the purchase of seed and for the collection of agricultural information. The crop reporting service was an outgrowth of this activity. The operations were continued by the Patent Office for twenty-three years, when the Department of Agriculture was created and took over the crop reporting operations.

From a small beginning, the Government crop reports service has expanded until at present it is the largest and most efficient agency of its kind in operation anywhere. One quarter of a million voluntary crop reporters in all parts of the United States aid Uncle Sam in his colossal task of keeping tab on his growing crops. The official monthly crop reports are based on the information sent in to Washington by sixty thousand farmers who live in all parts of the country. There are two thousand eight hundred counties in the United States and this means that there are approximately twenty-one zealous reporters in each county who survey crop conditions and advise Uncle Sam concerning their conclusions. In averaging up the results the state is the unit. All the assignments are done in triplicate to obtain more accurate average results. That is to say, Uncle Sam compiles his final figures from three different sets of state averages.

In each state in the Union, a state statistician employed by the National Government devotes all his time to studying crop conditions. He travels all over the state each month, visiting farmers, elevator men, millers and bankers. He does his best to qualify as the best-informed man on agricultural conditions of any in his state. There are twenty-

(Continued on page 136)

CHEAP ELECTRICITY FROM STEAM

*New Invention Gives All the Light, Heat and Power Needed in the Home for
Two Cents an Hour*

by ROBERT MORGAN

IF the public utility corporation in your town came to you and said, "Hereafter, you can have all the electric light, all the heat and power and all the hot water you want, for two cents an hour," you would think the millennium had arrived, wouldn't you?

If you had been paying, as you have

country, by the owners of homes, from small farms to large ranches. This—the cheapest power, light and heat yet produced except through hydroelectric plants of large size—comes as the result of an invention on which patents have just been received by C. H. Vincent, an engineer of Oakland, whereby steam, generated from a low Baumé test crude oil, is applied to the generation of electricity. The cost of current for four hundred and fifty lamps, steam to heat more than two hundred rooms, and plenty of hot water for these rooms, is thirty-five cents an hour, or approximately one and one-half cents per horsepower hour. In tests conducted over a period of more than a year, the inventor has reduced his costs of operation to less than one cent per horsepower hour, the lowest figure, according to available records, at

which light ever has been supplied by an automatic generating plant, either steam or internal combustion, without considering the by-products of steam heat and hot water available from this new plant.

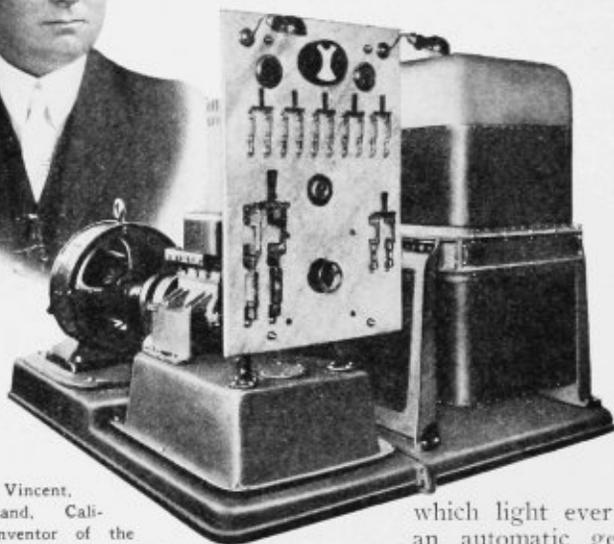
Comprehensive tests at various temperatures, from zero and below to 98 degrees, comparable to extreme winter and summer temperatures in an average range throughout the United States, also were made during this year of experimentation. In the coldest temperature, about that of winter in the northern tier of states, the plant operated continuously, automatically and efficiently, at the maximum cost of one and one-half cents per horsepower hour; while at the highest temperature, comparable with that of midsummer in the southern states, the



E. H. Vincent,
of Oakland, California, Inventor of the
New Steam Generator Plant
Which Produces Cheap Electricity

if you live in the United States, an average of four to five cents an hour only for the lights in your five-room home, or up to seven and one-half cents an hour if your wife washes or irons or heats a room with electricity, you would be rather prompt in starting an investigation into the two-cent-an-hour electric current for everything, including cooking, and plenty of hot water for bathing, with steam for heating.

Yet that is exactly what is being done in one city in California by individuals and groups of people—not by the public utility companies, but by parties of citizens, apartment house owners and, in the



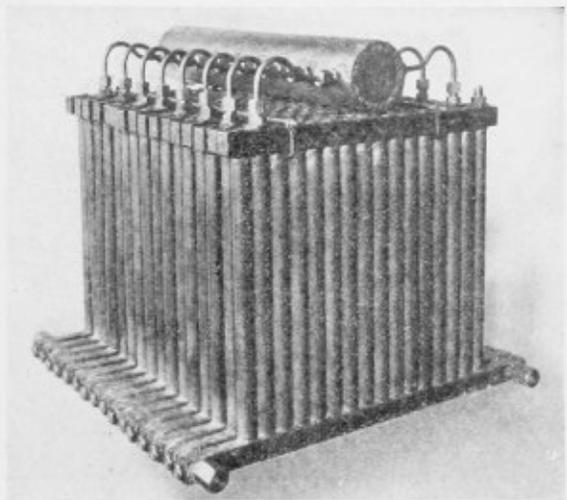
operation costs were reduced to one and one-quarter, and, occasionally, to one cent, per horsepower hour. Vincent believes that, by perfect housing conditions, the average for the plant in winter conditions in northern states can be reduced to approximately one cent per horsepower hour, but much depends upon the ability of the operator to get the most out of a steam engine.

The plant consists of a small, three-cylinder, high-pressure steam engine, developing 22 horsepower for the 15-kilowatt plant, and proportionately for the other plants, which are built in 5 to 100 kilowatt sizes. This engine is direct-connected to a motor-generator and to a Westinghouse generator. Superheated steam, at a pressure of 700

pounds, is supplied by an upright boiler, cubical in shape, and containing 256 tubes, one advantage of which is that any one tube can be removed for repair or displacement, without putting the boiler out of business, or delaying its operation longer than for the cooling time required. The crude oil is atomized and mixed with air in the combustion chamber, but not vaporized, and thereby produces a more perfectly combustible gas.

To start the plant, the switch is thrown in connecting the 12-volt battery with the 12-volt motor-generator, which operates a fuel, air and water auxiliary. This auxiliary, which runs continuously, supplies water to the steam generator, by passing it at a predetermined water level. The fuel is atomized under 160 pounds pressure, and directed into the combustion chamber through a space admitting air, which is supplied in sufficient quantity and at proper pressure by a fan located between the radiator condenser and the steam generator unit. The air is carried into a chamber surrounding the steam generator and the combustion chamber, where the mixture of air and atomized oil is ignited by an electric spark.

When the working pressure of 700 pounds is reached, the fuel is cut off and the air deflected, both operations being automatic. When the pressure drops 25



In the New Plant's Tubular Boiler Any One of the Two Hundred and Fifty-six Tubes Can Be Removed for Repair or Replacement Without Wasting Time

pounds, the burner is lighted again and the air deflector closed, also automatically. In fact, other than starting this plant, every operation is automatic.

The actual cost for the operation of this plant at its peak load is thirty-five cents, or a fraction less per hour. It will supply continuous light to eighteen houses or apartments of twenty-five lamps each—far above the average since all the lights in a house seldom are in use at one time. In addition, it will provide abundant steam heat and hot water for twenty houses of ten rooms each. Thus the cost, either for community lighting or apartment house illumination, is rather less than two cents an hour for each house or apartment. This is not theory or estimate, but actual practice.

It is useful on small ships, where it supplies power for winches, deck hoists and capstans; lights for the entire vessel, and heat and hot water for the state-rooms, as well as electric power for the refrigeration plants, the steering gear and the electric ranges in the galley. An automobile with this steam generator installed is in everyday use on the streets of Oakland, and has been running without repairs for more than six months. The inventor's original aim was to provide a cheap method of producing light, power, heat and hot water for farms and isolated homes.



By Mounting a Propeller at Each End of a Diameter Line, This Circular Boat Is Made to Rock and Run in a Zigzag Course Until the Occupants Have All the Thrills of a Sea-Sick Ocean Journey in Just a Few Minutes

Look Out There, Boys! You Know What Happened to Adam. But in Place of Taking Away the Garden of Eden, Miss Betty Wright, Nationally Known Artist's Model, Is Posing for a Picture Called "An Apple a Day Keeps the Doctor Away"



The Operating Room of the New St. Michel, in Paris, Has a Huge Glass Dome Which Permits an Audience of Doctors and Students to Watch and a Radio Microphone Which Makes It Possible to Hear Even Whispers. Thus Students Can See Difficult Operations Performed and Hear the Comments of the Performing Surgeons

Talk About Individual Instruction, District No. 10, Town of Parish, Oswego County, New York, Has a School House and Hires a Competent Teacher and There's Only One Pupil Comes to School There





Where HUNTING Is a Part of RELIGION

The Ancient Chase Ceremonials Are Still Retained by the Pueblo Indians of New Mexico

by S. OMAR BARKER

WHEN we say of a white man "hunting is his religion," however true it may be, we are merely kidding him. The good wife watches the tenderness and care with which her more warlike half cleans, oils and fondles his rifles and shotguns when the sharp days of autumn and early winter begin to stir his blood, and her opinion is likely to be that if George has any religion at all, hunting is it. Perhaps she is right. If she were a Pueblo squaw and George her black-haired husband, there would be no doubt about it. For to the Pueblo a hunt without all the proper religious ceremonies and fetishes would not only be dry and unsuccessful, but it would be "bad medicine" as well. The mystic, philosophical Pueblo may, in many cases, have acquired an expert facility with the modern rifle, but that has not destroyed his old symbolical ideas concerning the children of the wild. In some villages there are young scoffers who see as the white man sees and laugh at what they call the old superstitions, but solemn tales are often told of the unhappy end to which these young Pharisees are ultimately brought.

In order to understand the Indian's point of view we should first know that the Pueblo, like the ancient Egyptian, is a worshiper of Nature, especially of animals and birds. These are not always thought of as gods themselves, but rather as mediators between gods and men. This is especially true of the eagle

and of the various prey animals such as the mountain lion, wild cat and coyote—rather than of game animals. Indeed it is upon this power of the prey animals, transferred to the hunter by means of a fetish or stone image of the prey animal he carries, that his success in the chase depends.

One old legend has it that in the days when the world was new, two Sun Children, after drying up the face of the earth with lightning fire, found that prey animals were likely to devour the human race after all, and so went about striking lions, wild cats, wolves, coyotes and bears to stone. In so doing they did not destroy their power over wild game, but only rendered them inactive and serviceable to men. Thus do the Pueblos explain the many odd stone formations found, wherein can be discovered some likeness to an animal of prey. When a small stone even vaguely resembling a lion or bear or wolf is found, it is considered a sacred fetish, and is improved upon by the priest of the Prey Brotherhood and deposited within the sacred room of whatever order is considered the Order of the Hunt in that particular pueblo.

When a member of the order sets out to hunt, he comes to the priest and after prayers and the scattering of holy meal he is allowed to take one of these stone images, which he immediately places in a pouch worn over his heart. Finding fresh tracks, or the bed of his quarry—



PHOTO BY E. HARMON FARKNEY

Men with Antlers Placed on Their Heads and with Sticks in Their Hands for Forelegs Represent the Animals in the Deer Dance

deer for instance—the hunter draws forth his fetish, draws breath from it through his nostrils, goes through a varied ceremony of prayer, often calling upon the sticks and brush to hinder the progress of the game, gives a cry like that of the prey animal whose magic image he carries, and goes after the game, fully assured of success.

The idea back of the power of the fetish is that the prey animal possesses the power of strong magic over game. This was given it in the beginning by the gods. Its breath blown in the direction of the frightened animal stiffens his limbs so he cannot escape. The sound of its roar or bark is believed literally to paralyze the game with fear. Now, when the Sun Children turned these prey animals to stone, says the legend, they did not destroy this magic power, but made it available for man.

Time was, of course, when the hunter had to slay his game with stones, throwing sticks, with arrows or by actually running it down, all of which was impossible, of course, without the aid of the magic of the stone prey animal carried over his heart. The efficacy of modern firearms is making some inroads upon those ceremonial phases immediately preceding the slaughter. The

Indian has learned in spite of his religion that just when you are about to get within range of a deer is no time to go around roaring like a lion. But he doesn't let that bother him; he merely does his roaring earlier in the game.

When the quarry has been brought down, the properly pious hunter tries to get to it in time to draw a breath or two from its nostrils before its lungs cease to function entirely. This propitiates the gods of the game animal slain and increases his slayer's good luck. Next he opens the heart cavity and bathes his fetish in blood, laying it aside to dry. Sometimes the appropriate thing to do is to sip some of the heart blood or eat raw bits of the heart or liver himself. It is always advisable to save some of the hair and blood, wrapped, perhaps, in a bit of skin or the tragus sac of the ear.

White men pack their game in with the skin on, not for religious reasons, but for sincere and universally accepted ones. They like to show off. Maybe it is to the wife, maybe just to the rest of the party or maybe for a posed picture, but the idea is the same. The good Pueblo considers it a breach of ceremonial propriety to skin and dress game in the woods, though he usually removes the entrails. Tying the feet together or sometimes making a band of the skin of the legs to go about his head, he packs his quarry into the village and deposits it at the door of his dwelling where the women take charge and, after also drawing a breath or two from the dead nostrils, they proceed to skin the game and take care of the meat and hide. Their successful Nimrod meanwhile returns the fetish to its sacred resting place, giving due thanks and incidentally pointing out that in his hands it has had plenty of game blood to drink.

The method of packing in was at one time, I am told, a part of the ceremonial requirement of the hunt, but that phase seems to have entirely disappeared, for the Pueblo will pack his game in on a horse just as his white brother does, though usually much more expertly and with less of what the Mexicans so well name "battle."

All of this apparently superstitious and childish ceremony is far from superficial and temporary. It has its founda-

tion in age-old folklore and sacred legends handed down in the various tribes from prehistoric times. Though the Pueblos are one people, distinctly different from all other Indians, they too have become divided into many smaller groups, so that today there are a score of separate villages in New Mexico and Arizona all differing in many tribal features. The deer hunters of Taos, the rabbit hunters of Zuni and the snake dancers of Hopi naturally show great variance in their legends of the chase. Among them all, however, the various prey animals are associated with the "six directions," including up and down, and these directions are, in turn, symbolized by colors.

According to one legend the Sun Children gave unto Long Tail, the mountain lion, the great country to the north, for he is yellow. The west became the dominion of the bear and its color symbol, illogically enough, is blue. Bush Tail, the wolf, rules the white east; Badger the south, with its ruddy summer red; while the space above—all colored—is the kingdom of the eagle; and the black "below" is sacred to the mole. Over all of these the mountain lion is master, and each animal is looked upon as mediator and instrument of Poshayankya, one of the chief Pueblo gods who is believed to have lived on earth and taught the Pueblos many of their customs. Thus, if a man is at-



The One Part of the Ancient Hunting Ritual That Has Been Discarded Is the "Packing in" Process. It Is Now Done with Horses the Same as the White Man Does It

tacked by a bear or lion it is in punishment for his neglect of ceremony. Weird stories are told (and believed) of wolves that followed religious shirkers about day and night until they finally got back on the job and performed the proper rituals. A sheep herder, badly bruised and chewed upon by a cinnamon bear was found to have been warned several times for his failure to perform the religious duties of his order. The attack by his "Father of the West" pulled him back in line at once!

Another legend of the prey animals is a little more enlightening. A very powerful people, called by some Pueblos the Snail People, once succeeded in gathering all the game animals into a secluded canyon, keeping them there by

a corral of sacred meal; and though hunters and prey animals wore themselves out they could find no game to slay. Finally one huge elk or deer escaped and in following him the hiding place of all the game animals was found. The joyful discoverers summoned the prey animals, from the mountain lion on



All the Animals Have Their Individual Dances. The Buffalo Dance Is a Loud One Supposedly Carrying the Spectators Through All the Thrills of the Hunt

(Cont. on page 138)

IN THE CLUTCHES OF THE WEREWOLF

By MERLIN MOORE TAYLOR

Read This First

John Heath, a chemist, discovers a method for force-curing lumber which his employer, Jasper Willmot, demands as his due. Heath resigns and, aided by Peter Dawson, long in the lumber game, forms a company of his own. They are given a big contract by the Dawes Company, which attaches a time limit with a heavy forfeit clause. Failure means Heath's ruin. A legendary creature, half-wolf and half-human, is blamed for labor troubles in the Heath lumber camp which endanger the Dawes contract. "Buck" Bradley, the foreman, goads Heath into attempting to capture the werewolf. He sees the thing outside the bunkhouse window and dashes out to give it battle. Nelson, a lumberjack, rescues him after he has been severely clawed.

Now Go On with the Story

Chapter V

"HOW did I get back to the bunkhouse?" Heath asked of Nelson. "The last I remember that thing was choking me."

"I packed you in," admitted Nelson. "The werewolf up and ran before I got to you."

"And you didn't get to see it?"

The big lumberman shook his head. "No more than jest one flash before it went into the timber," he said. "I was too late to tell whether it was animal or human."

Whatever response Heath might have made was never spoken, for he noticed that all the men were around their bunks, rolling up blankets, extra clothing and personal belongings in their "turkeys."

"What's going on?" asked Heath.

"They're calculatin' to go, come daylight," was the reply.

"Quitting their jobs?" demanded the one man whom such action would ruin. "You're not leaving, too, Nelson?"

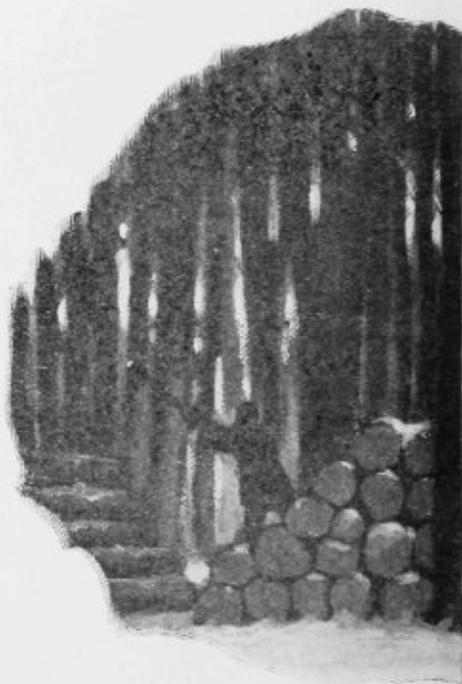
"You don't see me packin' no turkey, do you? I ain't one to be scared off by no man—or varulf, either."

"They mustn't go," said Heath decisively and weaved weakly to his feet. "Men, men," he cried, "You must stay. You must."

The lumberjacks paused in their pack-

ing to turn and gaze curiously upon him, swaying there on the bunkhouse floor, his face scratched and bleeding, his throat swollen so that he spoke with difficulty.

"We go," bellowed one man, elbowing



his way to the fore. "I've logged in the toughest camps this side o' the Canady line and I've fit the worst gang o' timber thieves as ever chopped a tree but when it comes to fightin' werewolves I'm off. We go."

A chorus of approving yells greeted his words. "We go. Sure we go. Who says we don't?"

"No," repeated Heath doggedly. "You must not go. I saw this thing and chased it and fought it and I stay. Nelson stays. Stick with us, men. We'll hunt down this thing, whatever it is, and

show everyone that we are not to be frightened off the job by any werewolf that ever roamed the woods."

Laughter, loud and jeering, greeted the words. "Who's the brave laddie?" cried one of the men. "Tryin' to tell us what we must do. The clerk. Not even a lumberjack. He'd hunt the werewolf, he would."

Nelson leaped to the side of Heath who, with closed eyes, was sinking to the floor. "Have sense," he growled at his fellows. "Go if you want to and be damned to you. Me, I stick by this man.

and burn and loot and kill in the madness of blood lust. Let one brave man stand up and face and defy it and it is a mob no longer. So it was with the lumberjacks, lashed by the scorn and ridicule of the big Viking's words. They did not go as they had intended, but laughing loudly and joking coarsely, turned into their bunks as if the encounter with the werewolf never had happened.

"Buck" Bradley, when they met at the breakfast table, was inclined to be sarcastic about Heath's appearance. Apparently he already was pretty well



All he's got in the world hangs on whether this camp gets out the stuff on time or quits like dogs. He's John Heath. He's the man who has been paying you—who'll be broke if you leave him in the lurch. Now go if you don't want to be men. Go and I'll have the whole woods laughin' at you for not bein' as brave as a city chap. Me, I stay with John Heath."

There is a curious psychology about a mob. Give it a leader and it will rend

"On the Far Side They Could See a Shadowy Figure Moving About Near One of the Log Piles"

informed about the details of what had occurred. "You come up here to catch the werewolf and nail up its hide, Mr. Heath," he said, "but it looks as if the werewolf had caught you. Ho, ho, ho."

His mirth struck no answering chords among the woodsmen. One or two smiled but they did not echo the foreman's laughter. He frowned as his gaze swept the faces about the tables and within him the heart of John Heath leaped. Even in his ignorance of lumberjacks, he was well aware that their refusal to join in the sarcasm at his expense was not due to the fact that he was their employer. It must be something else. Dare he hope that it was because they were lined up on his side now that they seemed to resent Bradley's attempt to belittle him?

"Got to go out with the crew and get them started off," said the foreman after breakfast. "I'll meet you in my shack in an hour or two. You'll hardly be workin' here as a clerk, now that the men know who you are. When you told Nels the truth, you spilled the beans. My hunch would be you can't do no good by stayin' on."

He strode off in the wake of the men toward the slashing where the day's work was to be done. Heath gazed speculatively after his broad back. Why was Bradley apparently opposed to having his employer remain at the camp? Was the foreman in a conspiracy with Heath's enemies to bring about failure on the Dawes contract? Or was Bradley simply too frank to pretend a liking toward Heath which he did not feel? Heath had not satisfied himself when two hours later he saw the foreman returning across the clearing.

Heath followed to the shack in which Bradley lived. He threw open the door. From within came a deep-throated growl and Bradley's wolf-dog faced him, hackles upright, fangs bared, a savage menacing gleam in his yellowish-green eyes.

Heath stepped back in alarm. Then Bradley's voice cursed the dog, there was the thud of a heavy boot crashing against the brute's ribs and a subdued howl of anguish from the dog.

"You can come in now," said Bradley.

"Don't know as I blame you for bein' afraid of Satan. He's a dog, not a werewolf."

Heath's anger rose. Twice that day the foreman had deliberately sneered at him and insulted him. It seemed as if he were trying to provoke his employer into a battle with him, an unequal set-to in which Heath would be beaten before he started, handicapped by the breadth and bulk of the woodsman.

"That will be about all from you, Bradley," he said curtly. "I don't like you any better than you appear to like me, but that has nothing to do with our relations of employer and employe. Dawson says you are a good foreman, that no better lumberjack lives and that is the kind of a man who is needed here. As for that dog of yours, keep him away from me. I'm not going to be bitten by him."

Perhaps the praise for his ability had its effect upon the foreman. When next he spoke, there was no antagonism in his voice. "Satan ain't likely to bite anyone once he's acquainted," he said. "Leastways, not unless I tell him to. Then all hell couldn't stop him." Abruptly he switched the subject away from the dog. "I guess you'll be going on back to the city, Mr. Heath."

"No," said Heath, "I'm staying here. I told the men I would as proof that I did not fear the werewolf. I always keep my word."

When he left the cabin a few minutes later he walked across the clearing toward the spot where the night before he had battled the werewolf. He remembered that in the struggle he had lost Nelson's revolver. Perhaps now he could find it. Incidentally, he was of a mind to see if he could discover the tracks of the thing.

He didn't find the weapon, neither could he discover any tracks. Where they might have been, someone had passed along dragging a handful of twigs over the snow which had wiped out not only the footprints of the werewolf but the marks of the man's boots as well.

Chapter VI

In the days that followed Heath ac-

accompanied the crew into the timber and, while his personal dislike for "Buck" Bradley was in no way abated, he could not but admit that the man knew his job. From dawn until dark the foreman drove his crew and the ring of their axes and the whine of their saws was uninterrupted. Great piles of logs grew as if by magic in the slashings and the teams which were engaged in hauling them to the siding where they were loaded aboard flat cars for the sawmills worked far into the night in an effort to keep up.

On the banks of the river which would float the logs down as soon as the spring thaws carried away the ice other piles likewise appeared. Heath saw with joy that at the present rate the danger of falling down on the Dawes contract was being eliminated.

After that encounter with Heath, the werewolf had not been in evidence again. There seemed no reason why the city man should stay on at the camp. Yet he lingered. Perhaps the great forests and the rugged health which he enjoyed as a result of being so much in the open kept him there. Dawson had written briefly. Everything was running ship-shape. There was no need for Heath to hurry back.

Then one day as he roamed through the woods with a shotgun upon his shoulder, Heath came upon Jasper Willmot. They recognized each other at six paces. "Ah, it's John Heath. You're looking fine," said Willmot.

Surprised, Heath nevertheless did not forget his manners. "I can say the same for you, Mr. Willmot," he replied.

"Yes, it's the outdoors," the millionaire went on. "In my day I lived in a lumber camp. Never have got over a feeling of stuffiness in the city. Have to get out in the open once in a while. I love the woods in winter. This time I'm combining business with pleasure. Looking over a bit of timber I own up here, next to the tract you have under lease."

Suspicion came to the fore in Heath's mind. Jasper Willmot was the one man in the world he had reason to think would be eager to harm him. Their quarrel over the preservative formula—Heath's victory in bidding for the Dawes contract—someone's efforts to hamper the work of Heath's cutting crew. Was

Willmot back of these efforts? His presence here at this time was surprising in spite of his ready explanation.

As if he had read Heath's thoughts the other man came closer. "You and I had words once, Heath," he said abruptly. "I have thought it over since. Perhaps I was wrong. I want no man to hold hard feelings against me. Let's shake hands and drop it."

Heath could not refuse. Was Willmot sincere or was this but a move to disarm his suspicions? The question beat against his brain even as he took the other man's hand.

"Heard you've been having a bit of trouble over at the camp," Willmot went on. "How'll the shortage of flat cars affect you?"

"Shortage of flat cars," Heath echoed. "I didn't know there was one. We've been getting all we need."

"Ah, then you haven't heard. Someone, I'm told, has contracted for all those that are available on the little railroad between the lumber camps and the mills. It's a private road, you know, and that can be done irrespective of what it does to the little fellow. It doesn't hurt me any. All my logs are being put at the river. Floating them down is cheaper and I'm in no rush. But I'm thinking it might put a dent in the Dawes contract for you. Well, I'll be going. Good day."

"Just a minute," said Heath. "Who's doing all this?"

"I'm sure I don't know," was the reply. "I didn't ask."

Watching the millionaire stride away, Heath was thinking to himself that Willmot must have had some motive in telling him what he had. Was Willmot himself the man who had contracted for the flat cars and was it but another move to checkmate Heath? Hauling the logs to mill by rail was expensive but it had to be kept up all winter if Heath's plant was to be kept busy and the Dawes contract fulfilled.

Fresh worries were in his mind as he turned back to camp. He must go down to Millville, hunt up the owners of the logging railroad and take prompt steps to meet this new emergency if what Willmot had said was true.

He said nothing to "Buck" Bradley

about it, but after supper he called Nelson aside. "I'm going to ask you to keep an eye on things here for me," said Heath. "They seem to be going all right but what good will it do me to have the logs and no way of getting them down to the mill? If I know that I'll get the logs I can dismiss them from my mind and devote my attention to keeping the cars coming up to the siding."

They had been much together of late, these two, and Heath had discussed his problems frankly with the big lumberjack. Nelson did not hesitate now. He thrust out a hairy paw. "You can trust me, Mr. Heath," he said.

He might have said more, but just then they heard a dull thud, thud, thud that seemed to originate off in the timber. For a moment Nelson listened intently, his head cocked forward. Then he grabbed Heath by the arm and began to run down the tote road that led to the place where the tree cutting went on by day.

"Come on," he said. "Somebody's spikin' logs."

Heath knew what that meant—the most despicable crime of which a lumberjack is capable. Great spikes are driven into the logs and, unless one suspects, cannot be detected by the casual eye, concealed as they are by the rough bark. Placed upon the carriage in a sawmill, the spike shatters the great steel saws the instant they come into contact and the flying pieces, hurled with terrific force, maim and tear those they strike as does shrapnel on the battlefield.

To the man directing the saw it is almost certain death. Even if he escapes, the saw is ruined and valuable time lost while another is set up if, indeed, extra ones are kept on hand. One case of a spiked log often is sufficient to make an entire sawmill force quit. Only malice of the blackest inspires log spiking and seldom is a single log thus turned into an engine of death. The mill crew does not want to take chances, so it quits and during the busy season to recruit another is almost impossible.

As they approached the slashing, the thudding became clearer and they could identify it as the ringing of steel against steel. On the far side they could see a

shadowy figure moving about near one of the log piles.

"Slip up on him if you can," whispered Nelson hoarsely. But a branch, concealed by the snow, snapped underfoot and betrayed them. The spiker took to his heels and ignored Nelson's bellows for him to stop and threats to shoot—threats that were vain, for the lumberjack was unarmed.

"We'd better tell Bradley at once," said Nelson as they marked the spot where the spiker had been at work. "He'll want to go over these logs as if he was lookin' for gold."

The foreman was in his cabin and received the news with apparent anger. "If ever I find out who done it," he said, "I'll fix him aplenty. I'll take no chances on a spiked log gettin' down to the mill, Mr. Heath. I'll look 'em over myself."

Outside the bunkhouse door Nelson paused. "If 'Buck' had been out I'd have thought I knew the answer," he said, as if speaking to himself. "I would have sworn I couldn't be fooled on a man I knew even in the dark and I was positive sartin it was 'Buck' that was spikin' those logs."

Chapter VII

In pursuance of his plan for going to Millville and seeing about the flat cars, Heath stopped at Bradley's cabin the following afternoon to tell him that he would be away for a day or two. The foreman had not gone out with the crew after the noon meal which was served at the camp because of its proximity to the place where the men were working. But when Heath pushed open the door the place was empty, so he sat down at the foreman's desk to wait for him.

Without any intention of prying, Heath glanced at a typewritten paper which lay open at his elbow. It was his own name, appearing in several places, which caused him to pick up the paper. Without date line or preliminaries, it said:

What you have reported about Heath makes it necessary to take prompt steps to remove him from the scene of operations. The influence which you say he has gained over the men is showing in the fact that lumber is reaching the mill

(Continued on page 140)

SOMETHING NEW TO EAT

by M. H. TALBOTT

Uncle Sam Has Men Working in All Parts of the World Finding New Fruits and Grains for Cultivation in the United States

DO you ever get tired of "the same old things to eat?" Do you ever wish you had something new to tempt your palate? Well, do not despair; Uncle Sam holds out hope in the shape of new vegetables and fruits, which he has brought from some of the most inaccessible places of the world. Some of them have already blazed a rough trail to market and all of them, with modern advertising and selling methods and growers who are willing to get out of a rut, will soon be available for our tables.

The dasheen, a new potato from the West Indies where it is a staple food for millions of people, looks like a cross between a large white potato and a sugar beet. However, it has a more tempting flavor and a higher food value than the former, containing 50 per cent more protein and the same additional percentage of starch. When cooked, the flesh of the large tuber is a violet in color and its taste is suggestive of boiled chestnuts. Its leaves may be cooked and eaten like spinach. It is easily raised, yields four hundred and fifty bushels to the acre and has proved no more difficult to keep in



The Udo Is a Japanese Vegetable Which Resembles Celery. It Can Be Grown Throughout a Wide Area in the United States

There Are a Number of Newly-Transplanted Edibles Which Are Already Widely Used in This Country and There Are Some Not So Well Known That Are Just as Good

storage than the sweet potato.

Since America is a land where salads are popular, the udo from Japan is welcomed. It has been called the Japanese celery, but slices of it are more crisp than celery and it has none of the objectionable fiber of the latter. Its taste is somewhat like

that of the midrib of lettuce with a slight but most agreeable suggestion of pine. When cut in long, thin slices and covered with French dressing the tips make a delicious salad, while the stalks may be creamed and served like asparagus, which plant it strongly resembles. The udo is an especially valuable addition to our vegetable list as it is easily raised in a wide area, growing successfully in all parts of the United States, being ready for market in the late fall and lasting all winter.

How many of you have eaten the chayote, or vegetable pear? It can be purchased in the markets of most of our large cities. Big, green, and pear-shaped, with a rough, prickly skin, it has a texture like a squash with a flavor somewhat like a cucumber but more delicate. This new vegetable grows luxuriantly in the lowlands anywhere below

South Carolina and has remarkable keeping qualities, for those shipped North in the late fall are in good condition in March, giving the housewife a welcome change from the ordinary winter vegetables. It may be used in a number of ways—baked, fried, stuffed, creamed, and as an ingredient of salad and soup.

To the Californian, bur artichokes are about as familiar as oranges and, as they can be grown any place where the climate is warm, it is only a matter of time until they will be seen in many gardens.

They look like big green flowers formed of overlapping leaves clustered about a heart, not unlike pine cones, except that the artichokes are round and often five inches in diameter. They can be creamed, stuffed, fried, stewed, made into omelet and soup and make delicious salad either alone or in combination with other vegetables.

A few years ago petsai, or celery cabbage, was unknown, but today it is taking the place of lettuce in many homes. It has proved an economical buy, for the inner leaves are used as a salad and the large outer ones cooked like cabbage—with the added advantage that it gives forth no odor while cooking. The gardener is finding it desirable owing to the fact that it may be planted in mid-summer and is ready for use after the season when ordinary cabbage is over, thus allowing one piece of land to produce two crops of cabbage. It does not resemble our cabbage, for it is tall with narrow leaves closely clustered around the stalk and the leaves are frilly around the edges. It will grow any place where ordinary cabbage will grow and can be used the same as the old variety.

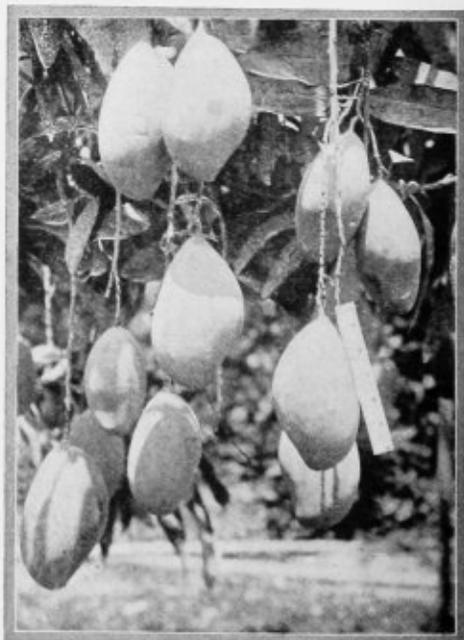
The avocado, better known as the alligator pear, comes north from Florida



The Chayote Is a Kind of a Half-Brother to the Pear. It Grows Well in the Southern States and Has Excellent Keeping Qualities for Long Shipments

at a time when hostesses are looking for something attractive to add to the menu. In homes where products of the tropics are appreciated, it is frequently seen. Attempts to eat this fruit out of one's hand like other raw fruit would result in disappointment. The proper way is to peel it and cut it up into a salad and eat with mayonnaise or French dressing, or to split in half and eat as one would a melon with lime juice, or salt and pepper, or even with sugar. They are so nourishing that many people make a breakfast of them. The

flesh of the alligator pear contains about 20 per cent of fat, therefore they may be served as a substitute for meat. There are a number of varieties of this fruit

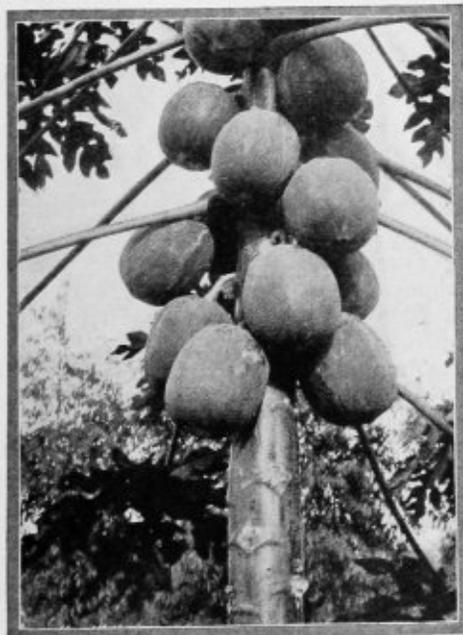


The Peach Has a Rival in the Mango Which is Gaining a Foothold in the Northern States

ranging in color from a light green to a dark purple, often with brown spots and indentations.

We all know how useful the grapefruit is as a bracer when the appetite is jaded. It has a rival in the papaya, an all-the-year-round fruit which resembles the melon in size and shape but grows on a tree. The flesh is golden yellow, held within a rich colored rind and, eaten either with sugar and lemon or without any flavoring at all, it will stimulate the most jaded appetite and is a boon to the sufferer from indigestion. In fact it is quite as valuable for its medicinal properties as for its qualities as a food, and long before it was grown in this country its leaves were sent from the tropics and used as the basis of many remedies for stomach disturbances. This fruit has been neglected until recently owing to the fact that it does not stand long-distance shipping very well, but of late with improved shipping facilities it has carried successfully and the problem of marketing it on a commercial basis is being solved.

Another fresh fruit rapidly making a reputation in the North is the mango, and well it may for the average consumer will have little trouble either in eating



The Papaya, the Melon That Grows on Trees, Is Easy to Eat and Is Good Medicine for Indigestion



Tubers of the Dasheen Have a Higher Food Value Than the Old-Fashioned White Potato. The Leaves Are Also Cooked Like Spinach

or liking it. In beauty, quality, aroma and delicious flavor it is held by many of its friends to rival the finest peaches. The chief drawback in developing it commercially has been the difficulty in growing a sufficient supply as it does well only in southern Florida. Growers down there, however, are putting it on the market and some of the new varieties grown under high cultivation and fertilization are delightful. The color of this fruit is green and golden yellow. Like the banana, the mango is valuable not only as a fresh fruit but can be cooked in many ways lending variety and piquancy to the daily fare. Unlike the orange and grapefruit the mango is a summer fruit, ripening from June to September. This brings it into direct competition in our markets with old established favorites, but experts say it will not be long until it is as popular as the pineapple, which a generation ago was fighting for recognition.

Did you ever hear of the citrange?

Its fight for a place in our national markets is opposed by our familiar friend the lemon, but there are some who say the lemon has not the ghost of a chance. While competing with the lemon the citrange is not a member of that acid family, but is a half-brother to the orange. It successfully resists cold as far north as New York. Its yield of juice is much greater than that of the lemon and it may be used in cooking for any of the purposes for which lemon is used. The citrange makes good preserves and marmalade and a delicious drink, too.



Here's How You Can Waltz on Ice

by ELON JESSUP

THE graceful, rhythmic waltz on ice is waltzing at its best. Almost all skaters want to learn how to do this apparently simple dance but only the fairly accomplished meet with much success. The reason is plain. The accomplished skater has built a foundation and the others haven't.

In order to waltz on ice one must first learn a few rudiments of figure skating. These require considerable practice but they are by no means difficult. Waltzing on ice is merely an actual application of these rudiments. When you have learned these, you have learned waltzing.

There are some people who can skate straight ahead with ease, even go backward comfortably, but who find the making of a turn quite difficult. This may mean that they are wearing skates which have extremely flat blades. If they wish to learn figure skating, they should get blades which are noticeably curved. But if they already possess skates having the proper degree of curvature, it is likely to mean that they have never discovered the possibilities of the "edges" of their skates. The first and last fundamental of figure skating and hence waltzing is knowledge of and constant use of the edges.

On each skate there are two edges—the inside edge and the outside edge. The first named is the one on the inner

side of the foot, while the other is the one on the outer side. In making a sharp curve forward on the right foot to the right, you are skating on the right outside edge; that is, the skate is tilted over on this edge. In skating circles, this action is indicated by the symbol RFO (right, forward, outside).

When progressing on the right foot in a curved forward direction to the left, you are skating on the right inside edge, an action which is indicated briefly by RFI (right, forward, inside). Similarly, respective turns made when skating backward are RBO and RBI. When the left foot instead of the right is used, the symbol L is substituted for R and the diagram thus followed.

The art of waltzing on ice consists almost solely of making these turns quickly and with ease on the four edges as conditions demand. Expertness in turning on these edges, both forward and backward, comes only with practice. One valuable form which this practice may take is that of describing a complete circle, skating this, in turn, forward and backward.

Further steps are the figure "eight" and the figure "three." The numeral "eight" as cut in the ice is merely a combination of two circles while a "three" is two half circles. The ordinary skating waltz, sometimes called the "once-back,"

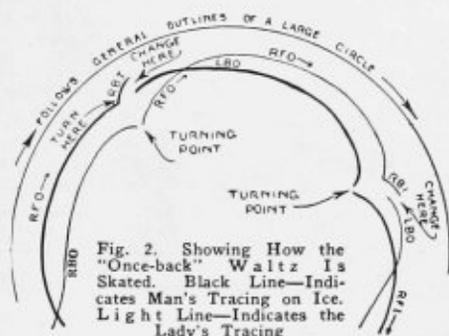
is hardly more than a series of figure "threes." Special attention should be given to this particular figure.

The ordinary "three" of figure skating is skated throughout on the same blade but with a change of edge when the end of the first half circle is reached. For example, if the first half circle is skated on an outer edge forward, the second half circle will be skated on the inner edge backward—all this on the same skate and with a single stroke. When halfway through, one turns and skates backward till the end of the second semicircle is reached. In the application of this figure to waltzing, the second semicircle skated backward by one partner is started on one foot but finished on the other. See how this works in practice.

The position of the partners in a waltz is similar to that taken by a couple on a ballroom floor. During their dance they revolve in somewhat the same manner. Their glides, however, are likely to be measured in yards instead of inches.

A man and woman, we will say, are partners and they are halfway through the first movement in the waltz step; in other words, they are halfway through a long circular glide which, when completed, will constitute the first half circle of the figure "three" just described. The man at the present moment, say, is skating RFO, which means that he is going forward on the right foot and on the outside edge of the skate under this. The position of his partner is exactly the reverse. She is skating LBO, backward

he has just been skating forward. Instead of finishing the circle with this foot, he changes to the left and skates LBO. The woman continues to skate forward, the man backward. But for the reversed position of the partners, the arc now being described is similar in every respect to the first arc. With the next turning point in the "three" the couple



revolves again and the woman skates backward.

A series of arcs executed in this manner assumes the general form of a large circle; that is, in time the couple comes back to the starting point. If, instead, they wish to follow the general direction of a straight line down the ice, this can be accomplished by reversing now and then when they are about to revolve at the turning point of the "three."

A somewhat livelier waltz than the ordinary "once-back" which I have just described is the "ten-step." This is composed of ten steps divided into four beats. Steps one, two and three are the first beat; four, five and six are the second beat, and seven, eight, nine and ten are the third and fourth beats. The steps are different from those of an ordinary waltz although the position of the partners is the same.

If the first three steps of the man are LFO, RFI and LFO, the simultaneous respective steps of his partner will be RBO, LBI and RBO. This brings them to the second beat. The change from steps three to four is skated with nearly a half turn and on four and five this is completed so that the man now skates backward and the woman forward. With steps nine and ten, the partners make their final turn and then start all over again, with one, two and three.

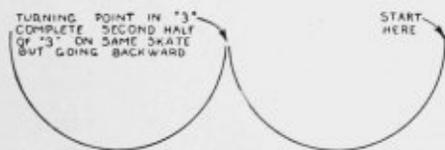
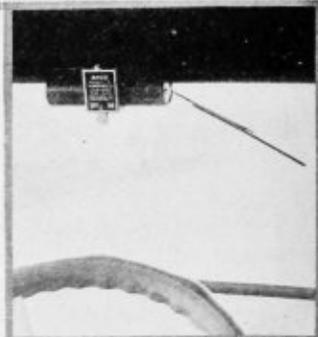


Fig. 1. Showing How to Execute the Figure "Three"

on the left foot and the outside edge of this.

At the turning point in the "three," the end of the first semicircle, the partners simultaneously revolve. The woman's position becomes RFO—the position which the man has held up to this point. The man changes to RBI, that is, starts backward on the second semicircle of the "three" with the same skate upon which

Recent Arrivals in Auto Accessories



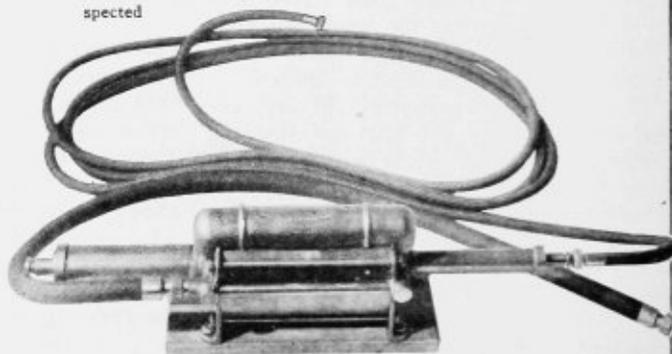
Above—The neck of this radiator bucket has an automatic valve which opens when crosspiece touches the radiator and closes the moment bucket is lifted

Left—Tire spreading tool, after being inserted, can be rolled freely around so that interior of tire may be inspected

Windshield cleaner operated by electric magnet is supplied the necessary amount of current by the storage battery of the car. When the cleaner arm is not in use, it may be swung free of the line of vision



Valve hood cannot work loose but it is easily pulled off or pressed on



Vacuum driven tire pump attaches driving hose to intake manifold but pumps pure air into the tires. Can be carried in tool box



License plate idea tends to reduce auto thefts because number is illuminated, bears name of car, seal of State and is locked



Air goes from one pillow section to next, resting your back

BUILDING YOUR AUTOMOBILE TIRE

☛ *Sit down—select a comfortable chair and take a trip through famous factories via picture and printed page. All the mystery of what goes to make the many silent shoes for the millions of cars that course the country is here pleasingly presented*

By GRACE ANDERSON ORB

HAVE you ever sat on your own front porch on Sunday afternoon and watched the automobiles go rolling by? Perhaps you have been of an inquiring turn of mind and counted them to see about how many passed in a given time. And maybe you have gone still farther and estimated how many thousands of dollars rolled by so easily just while you were thinking thus. Then (because you probably use a car yourself) you idly wondered how many drivers would have to stop and fix a tire before they got back from their trip. Undoubtedly the question came to you—"I wonder how tires are made that they withstand the wear they do."



FIRST FIVE PHOTOS COURTESY GOODYEAR RUBBER CO.

Preparing the Rubber Tree for Collection of Latex

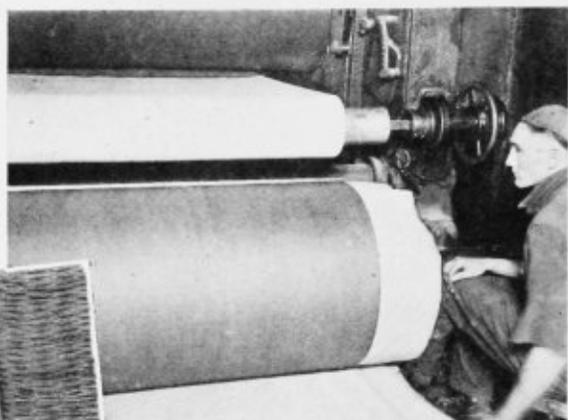
If you are interested in knowing the how, we will go to the home of the tire and follow the raw material through to the shipping room where the finished product is starting out on its long journey to every land and clime.

Stop a moment and look at the raw materials. First, look at the rubber in its various forms. We will take it for granted that you already know something of the milky latex of the rubber tree—how it is harvested, coagulated and

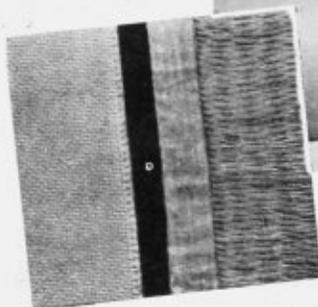


Native Workers on Plantation Preparing Dried Pale Crepe So That It May Be Boxed for Shipment

hung out in the sun to dry; how it is washed and sheeted and some of it smoked, until finally we find it reaching the



Fabric Being Frictioned. Note the Rubber Being Ground into the Fabric and the Protecting Liner Being Rolled with It After It Is Frictioned. The Square to the Left Presents Samples of Ordinary Fabric and Cord Fabric



tire factory in bales of Amber Gristly Crepe, Ribbed Smoked Sheets, Standard First Latex Crepe or perhaps just as a big chunk of raw rubber that has to be washed, dried and sheeted before it can be used. The growing and the harvesting as well as the individual characteristics of the various kinds of rubber form a most interesting story, but just now we are only concerned with the building of the tire.

Another raw material which is of special importance in the making of a tire is the fabric. This looks much like light canvas and comes to the tire factory in huge rolls weighing about 180 pounds. It is made from the very best of long staple cotton, each tiny fiber of which possesses great strength and toughness, twisted into eleven-ply yarn and woven twenty-three yarns to the inch, square weave.

The chemicals are the third of the raw materials which form the tire. These chemicals have been clothed in much of mystery and have been a source of speculation to the public, and yet there is little mystery after all. Each factory has its own formulas for the different kinds of tires which it makes, much as bread factories have different kinds of recipes for different breads and cakes. All, however, know what the necessary ingredients are.

Sulphur must be added to make the rubber vulcanize properly. Then there

is the stock which takes a bit of magnesia, or of aluminum flake, of zinc and mineral rubber (which is just refined asphalt), some cotton oil or maybe a bit of resin. Different combinations of these chemicals give the different stocks desired. For example, we give a couple of for-

mulas used by one factory for friction and black tread stocks.

Black Tread Stock

- 44 pounds Smoke Sheet (rubber)
- 44 pounds Pale Crepe (rubber)
- 20 pounds Zinc
- 25 pounds Carbon Black
- 3 pounds Palm Oil
- 8 pounds 8 ounces M.R.X. (Mineral Rubber)
- 4 pounds 8 ounces Sulphur



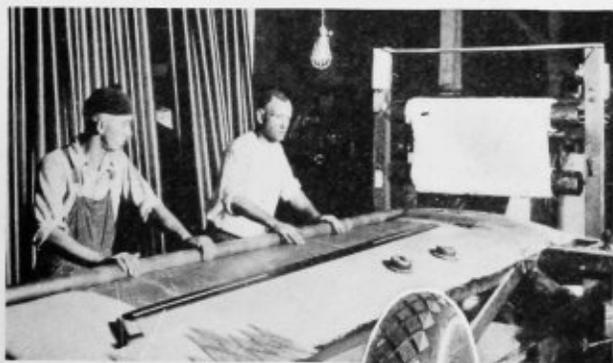
The Fabric Has Here Been Built Up Around a Core and the Operator Is Stitching Down the Plies

Friction	
30 pounds	Smoke Sheet (Rubber)
30 pounds	Pale Crepe (Rubber)
24 pounds	Brown Crepe
3 pounds	Zinc
6 pounds	Cotton Oil
6 pounds	Sulphur

Now that we have in mind the raw materials which are to enter the tire—the rubber, the fabric and the chemicals—we are ready to see how these are put together to make the tire.

In the first place, each one of these raw materials has some water in it, and this has to come out or disaster follows. So the rubber and the chemicals go to the large drying room where an automatic dry kiln keeps the temperature at 140 degrees and the humidity at 28 degrees. Since this is a moist heat, there is no danger of over-drying and when they come out there is but one-half of 1 per cent of moisture left in them. The fabric meantime has been put through hot rollers where moisture has been taken out of it. Now the raw materials are all ready to be used. Let us watch a batch of tread stock.

The different kinds of rubber (in the



Rolling a Tube. The Steel Cylinders in the Background Are Ready to Receive the Enwrapping Layers of Rubber Which Are Vulcanized into One Unit to Form the Tube. It Is Later Completed by Joining the Ends and Attaching the Metal Valve

quantities called for by the formula) and the chemicals (having been carefully weighed out into cans) go to the mixing mill, which is just two huge rollers be-



An Open Mold with Vulcanized Tire Which Has Not Yet Been Removed. Bolts Held the Mold Together



tween which the batch of material is constantly ground until it is thoroughly mixed. It takes from twenty minutes to half an hour to mix a batch. It is then taken out and put on large wire cooling trays, where it is left to cool and season for twenty-four hours or longer.

After it has thoroughly seasoned, this batch is taken over to the warming mill where it is warmed up and softened so that the calender may take it and roll it into sheets of the desired thickness and width. Knives

are spaced along the side of this roller at the various widths desired to make the layers of tread stock, and as the whole leaves the calender it is rolled in sheet-

Here Is the Finished Tire. How Many Miles Will It Run? Ten Years Ago the Average Was Around 5,000 Miles. Today an Owner Expects 8,000 or 10,000. Often He Gets 15,000 and Sometimes 20,000 and More



(Cont. on page 130)

ALONG AUTOMOBILE ROW



Steel Cased Reserve Tanks

WHEN on an extended tour it is desirable to have a reserve quantity of oil, gasoline and water. This point is well taken care of by a steel

The Box May Be Fastened Securely on the Running Board Where It Will Always Be Ready and at Hand. Since the Tanks Fit Compactly, There Is No Rattling. For Safety the Case Is Fitted with a Lock and Key

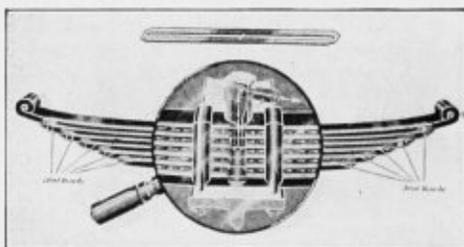


case which contains three small separate tanks. The tanks hold a sufficient amount of fuel, oil or water to carry the motorist on to a location where an added supply may be purchased.

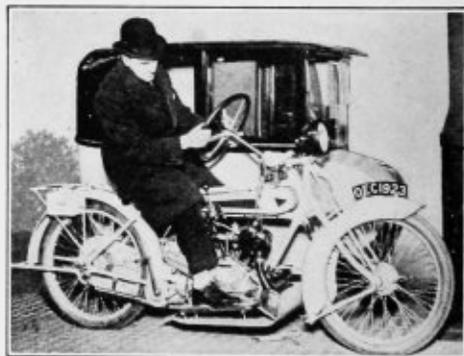
For Oiling Springs

A NEW spring leaf lubrication system which works by means of a center-fed spring insert acting also as a soft metal bearing between the leaves of the springs is offered to the motoring public.

It may be installed on any make of car by removing the springs and inserting the metal insert, .0025 of an inch thick, between each spring leaf. On cars that have a center bolt the old bolt is replaced with a special drilled bolt having an attachment to which an oil or grease gun may be fastened. On cars that have no center bolt a hole is drilled large enough to accommodate the special bolt.



Motorcycle Innovation



THIS motorcycle, with a limousine body attached as a side car and capable of holding three passengers, was introduced to the British public at the Cycle and Motorcycle Show held at Olympia recently. The control of the machine is unique because, instead of the usual handle bars, it has a steering wheel. Since foreign buyers demand high fuel mileage, it is popular.

The First Stock Sedan

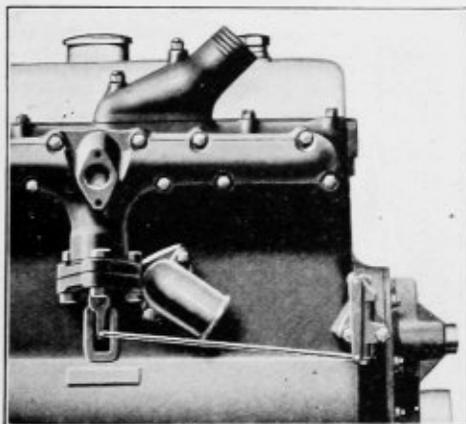
THE enclosed car is the most popular type of automobile at the present day and for that reason special interest centers upon a car which a manufacturer claims is the first stock sedan ever delivered in this country. It was shipped to a Dallas, Texas, dealer on



November 10, 1913, and sold to a citizen of that city. He continued to drive it until June of last year when he sold it to an attorney of the same city.

The sedan is now in its tenth year of service. It is evident that the owners took good care of the car.

Throttle Regulates Oil



ONE feature of a new model 6-cylinder car is a rod which connects the throttle (at the center of illustration) with the oil regulator (at the right). When the throttle is opened, it accelerates the flow of oil through a by-pass valve. This gives a maximum quantity of oil on low speeds when the car is pulling heavily uphill or through sand, mud or snow. By this means plenty of oil is fed just when needed.



Oil Lamp Car Heater

BECAUSE of this practical invention, at a cost of but a few cents per hour, motorists are now able to enjoy nearly all the benefits of a heated garage. The sheet-iron drum is built and ventilated so that the lamp will not blow out and so that there is no danger of fire. The heat generated by the burning lamp rises into the canvas cover for the hood and thus heats the water in the radiator. The water circulates about the engine and keeps it warm enough so that when it is desired to start the car it is ready at once.

Eliminates Elevator

AT this garage you may drive your car up to the proper floor without the bother of an elevator. The garage has three floors and is built on the side of a slope. There is an economy of floor space as neither elevators nor inside runways are necessary. The garage is approved by busy men who do not want to wait for slow elevators that are usually in use when needed.



FITTING PISTON RINGS FOR SERVICE

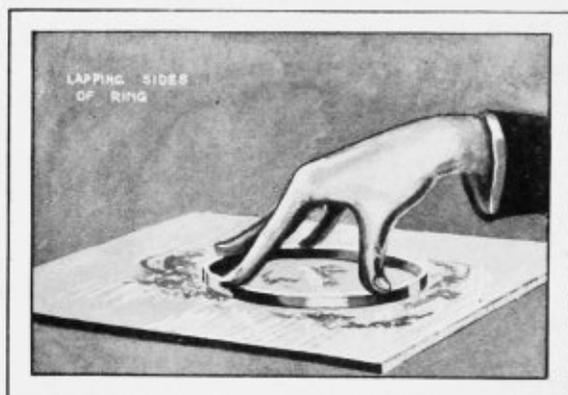
Q *Is your car losing its old-time "pep"? Is its gasoline mileage falling lower and lower? Are you considering getting rid of "the old can" because you think it has worn out? Stop a moment. Possibly all it needs is a new set of piston rings, perhaps with new pistons, to put it on the road again as spry as ever. At least it is worth trying. A writer who knows here tells how car owners can do the job themselves*

by L. B. ROBBINS

WHEN your automobile commences to lose power and smoke badly, it is a fairly good sign that gas and oil are leaking by the piston rings. It is a condition that should be remedied by replacing the old rings with new ones or by also fitting new pistons. It is a good job for the long stormy days of winter when the workshop should be

closed together. If too big they should be filed off on one end until they will fit without the ends quite touching. About 1/64 inch is a good distance between ends when the ring is in the cylinder at least an inch.

When the rings have been fitted to the cylinder, they should next be dressed down to fit the piston grooves by taking each new ring in turn and laying it down flat on a sheet of heavy glass coated with a fine grade of valve grinding compound. Then, pressing down upon the ring with all the fingers of one hand, rotate it in the compound, turning it every little while to change its position. Continue this for a few mo-



Above—Lapping Sides of Ring by Grinding with Compound on Glass Plate

Right—Working Ring into the Groove of the Piston So That There Will Be No Binding When the Two Parts Are Put in Service

in full blast, overhauling in preparation for the pleasant seasons to come.

Putting in new piston rings is not such a difficult job as it sounds, but it calls for certain details which must be observed in order that the completed work may be well done. Consequently we will take the details in their order and, by referring to the sketches, anybody should be able to do just as good a job as an auto mechanic and at much less expense.

First, try the new rings in the cylinder to make sure that they will fit when

ments on one side, then turn the ring over on the other side and repeat the process.

Test the ring occasionally to determine if it will fit the groove for which it was chosen. Always try it in the same groove. Select a ring that will most nearly fit a groove, because it will require the least amount of "lapping." When the ring almost fits the groove, the next step is to lap it into the groove itself.



This is done by smearing the ring with compound and rolling it in the groove, around and around, as shown. Lap the entire circumference in this manner. When it will just slide into the groove of its own weight, it is lapped enough. Wash off all compound from the ring and groove with kerosene. Mark the ring and groove so that no mistake will be made assembling the rings later. The rings must now be lapped to fit the cylinder.

The cylinder, too, must be lapped. This can be done by using an old piston just a trifle smaller than the one fitting the cylinder. Place in the grooves the rings already lapped.

Have the connecting rod attached and provide a stick of wood through its end for a handle. Lay the cylinder or cylinder block upon a good, solid bench and wedge it in position. Smear a coating of valve compound around the walls of the cylinder and wipe some machine oil over the rings on the piston.

Insert the piston and work it back and forth the entire length of the cylinder; be careful that the upper ring does not slip past the upper edge of the cylinder wall, for in some cars it will snap out into the wider head and be very difficult to get out again. Give the piston about one-eighth of a turn every second stroke. When it has been turned one revolution, making sixteen strokes, wipe off the compound and test the fit of the rings by smearing them with Prussian blue and then reinserting the piston and rings into the cylinder. Where there has been no contact the blue will remain, which means that the ring is not a tight fit and the lapping operation must be repeated until all of the blue is wiped off when the piston is inserted and turned. This

last operation cannot be accomplished quickly. The contact must be tried and tried until you are satisfied that the rings touch the cylinder walls all around. This is a good deal of work but it will repay you in perfect service.

Remove the rings from the old piston and replace them on the regular one and then push into the cylinder as before.

They should be worked back and forth in the same manner several times until they make a good, smooth sliding fit. Then wash off all compound once more and oil.

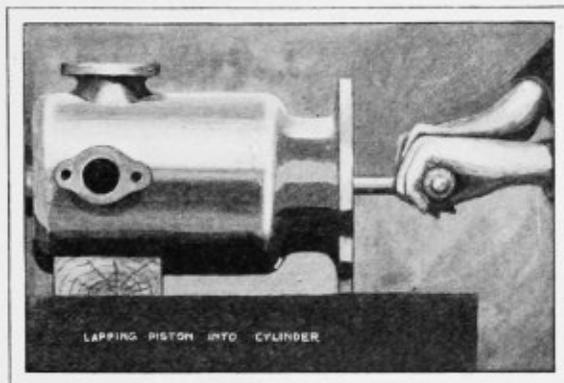
When all the rings have been fitted in this manner and the engine assembled, it should be run

slowly at short intervals to prevent overheating and burning, using plenty of oil. After a few hours running, full power will be realized from the engine.

If the old pistons are loose and it is evident that a good deal of compression is getting past them, it is then necessary to fit new ones. Oftentimes oversize pistons are not necessary, the regular new ones being of sufficient size to take care of the wear which has taken place.

In such a case the owner is lucky and the mere inserting of the new pistons into the cylinders is all that is necessary. The just-fitted rings should of course be first installed on the new pistons and the motor then reassembled. Under these conditions, the regular new pistons may be used.

But if found that with these there is still a good deal of clearance, then pistons of two, five or even ten thousandths of an inch oversize should be lapped in to fit the cylinders as was done with the piston rings. By doing this, the cost of reboring can often be saved with the same result—the motor will be restored to its original alertness and power.



Fitting the Rings into the Cylinder by Lapping Method. Or, Similarly, Fitting the New or Oversize Piston to the Old Cylinder Without Reboring



"Did You Look at the Fuse When the Lights First Went Out?"

"Yes. I Put in My New One. I Always Carry an Extra Fuse"

A Night O'Light

By LOUIS J. BECKER

SOOTHING, cool, twilight air enveloped the Brown family as their car purred along on the restful, rolling road. Two widening, white beams of light worked their way ahead to light the now deepening gloom. Suddenly the lights went out.

Mr. Brown straightened up, hurriedly reached for the dash switches and swung them crossways and sideways, hither and yon, but the gloom ahead continued to become even gloomier. Possibly Brown swore—I do not know as to this—I happened alongside just as he had stepped out and had begun to fumble with one of the headlights.

"What's wrong partner? Lights giving trouble?"

"Yes. We were riding along just as pretty, when all of a sudden—Pouf! Bliik! Bloom!—no lights."

"That's the way it generally happens," I consoled. "Let's find the trouble."

"First thing is to discover whether one of the bulbs has been broken or burned out. If your lights are wired in series, all the lights of a circuit will then go out. Is that too deep—that talk about circuit and series? They are like other ordinary things, once you understand them they

are as simple as spelling the word *cat*. Now, everybody can spell the word *cat* and, likewise, everybody can easily understand what circuit and series mean. Circuit is simply a flow of electric current from one terminal of the battery through a wire to electrical contrivances and through those contrivances to a second wire which leads back to the other terminal of the battery.

"When lights are wired in series, a single wire leads from the battery to one side of the light bulb, another single wire leads from the other side or contact of that bulb to one side of the next bulb and a wire leads from the other side or contact of that second bulb back to the battery. With smaller bulbs in the circuit as many as six bulbs may be included in such a series and you can readily appreciate that if one of the bulbs burned out it would break the flow of current in the circuit and all the lights would go out.

"A better method of connecting is the parallel system which has two wires direct to each bulb and thus only a single bulb will cease operating when one is damaged. If you have a 6-volt battery your bulbs will be 6-volt bulbs and if you

have a 12-volt battery your bulbs will then be 12-volt bulbs—unless as is sometimes the case only half the battery, or 6 volts, is used in alternation on the light circuits. Now, with the series system, if you have a 6-volt battery and three bulbs to a circuit, your bulbs will be 2-volt bulbs—the three bulbs together making up the 6-volt battery capacity. You must find out how your car is wired. Take off the lens frame of the headlight."

Brown tried to.

"Heck!" he exploded, "I can't get the darn thing off!"

"Yes," I admitted, "sometimes they are hard to get off but if you go at the thing right it will come off easily. Put your two hands level and on opposite sides of the lamp frame, push back on it strongly toward the car—that releases the catches on the inner side—note how the lens frame can be sprung toward the radiator by pressing as I have shown, then lift upward on the right hand and press downward on the left hand. The lens frame turns and comes off as easily as if you were simply steering your car around a corner."

"By George, it does!" he exclaimed.

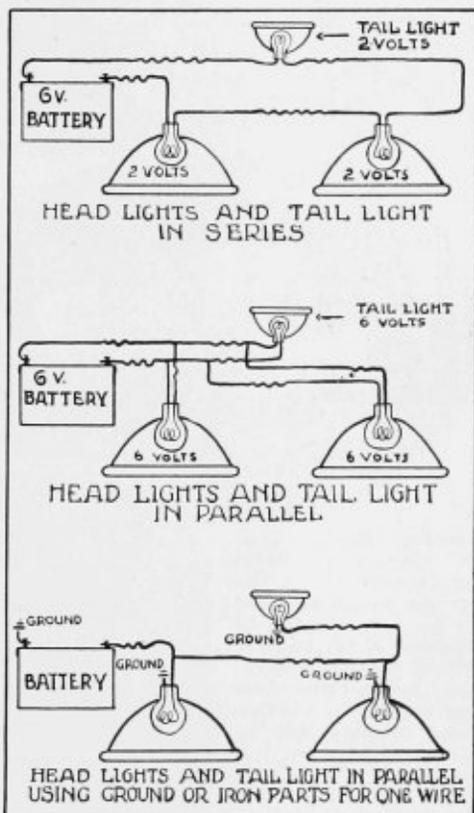
I handed the lamp frame and lens to him where he stood.

"Here, Brown, be careful not to drop the glass. Lay it in between the fender and hood where it is safe."

"Now let us take out one of the bulbs; in removing them press inward on them to release the little pin-catch from its notch and turn the upper side to the left—it then comes out easily. Have you an extra bulb? Slip it into the socket. No—that isn't the trouble. Let's try the other lamp and tail lamp. Wrong again! Let's look on the rear of the headlights at the connection-socket. Gosh! It's getting dark! Have you an extension light? Yes! That's a dandy! Fifteen feet of wire with a light bulb of battery voltage connected on one end and the other free to connect to the battery terminals. There, now we have a helping light! Well, both the connection-sockets at the rear of the headlights are O. K. and the rear light, too.

"I say, Brown, did you ever have your headlights crisscrossed, one dim and the other bright? I've seen it many times on a flivver when they had the connection-

sockets reversed. But that's digression. Let's see if we can't find out what ails your lights. Look at the battery connections—O. K. Trace the wires around, see if you can find any worn places in the insulating or a loose contact somewhere. All as it should be? That's



Wiring Diagrams of Three Ways in Which Your Lamps May Be Connected

strange—must be somewhere—I wonder if it can really be in those connection sockets at the rear of the headlights. Let's look again. By Jove! Here it is! One of the wires is not making contact at one side of the socket where a small screw holds it in a little cylindrical brass tube—tighten the screw—ah! There's the light!"

"Hooray!" enthused Brown.

"Yes," I laughed, "It is cheerful, isn't it?"

"It certainly is. Everything looks bright and all is right on this beautiful night with that wonderful light!"

A TOURING DICTAPHONE

This Traveler Records Enroute

EVERYWHERE, in every section of the country, are repairmen, garage-men and owners who know how to do some particular job about the car better than anyone else. In order to reach these men the editor of a Canadian automobile journal has rigged up a car with

additional miles when anyone else would have given it to the salvage man.

He would listen to your account with friendly interest and all the time you would notice that he was dictating your words into the mouthpiece of a metal-covered tube leading into the tonneau.

That is his way. He has found that men are not half so willing to sit down and write to him of their ideas as they are willing to enter into friendly conversation.

The equipment carried consists of a complete Dictaphone outfit and attendant paraphernalia. One of the difficulties he had to surmount was that such a machine required a 32-volt current and, since the magneto or battery of the car he used was not

of sufficient capacity, it was necessary to install a 32-volt battery and a three-quarter kilowatt generating plant and this supplied all the needed power.

The wax records carrying the voice impressions are stored safely away in a special box which is shipped to the office and there the reproduced material is set up in type in the magazine. This saves the editor much labor and gives him the opportunity to make the most of his allotted time.

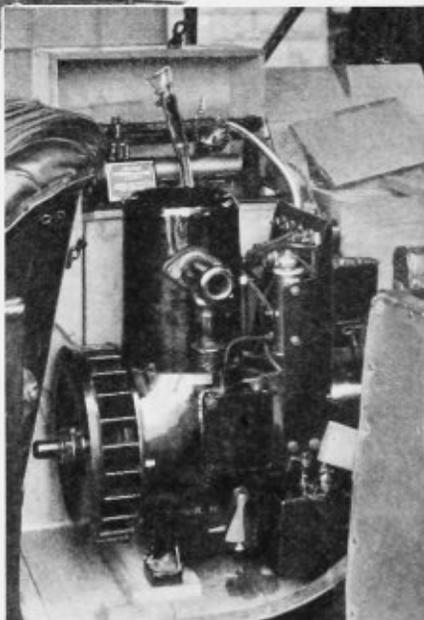
For the outlying farm districts he carries extra equipment in the form of a Tractometer. This instrument indicates in figures the exact amount of load a tractor is pulling. This is interesting to the farmers for they can then determine the drag in pounds of the different varieties of farm machines and use the knowledge to bring greater success.



Traveling About the Country, Speaking the Stories and Information Told Him into the Dictaphone Which He Carries in His Car, the Originator of This Idea Gets Material for His Magazine from Persons Who Know Just How to Do a Certain Thing Unusually Well Although They Will Not Take the Trouble to Write of It

the pictured outfit.

If you lived in the section where he travels, he might drive up and open a conversation with you. He would sound you on your likes and dislikes, your special antagonisms and preferences and would then probably lead up to your pet ways of repairing automobiles. Having warmed to him, for he is a likable chap, you would expand and tell him proudly of how you stopped your rear axle from leaking grease, how you once fixed an unfixable spark plug or how you lately made an old tire run a thousand

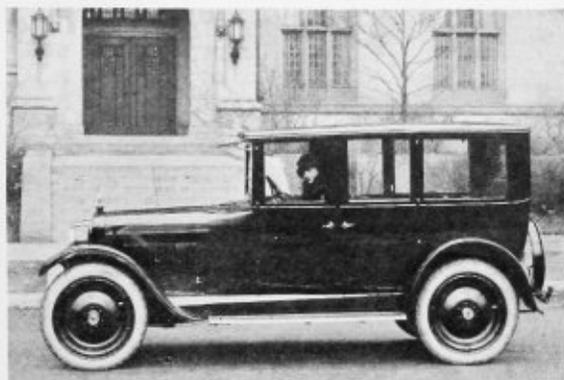


Milady and the Motor

by LOUIS J. BECKER

WOMEN of this modern era step forward into new activities the entrance to which was once barred to them. They step forward not in chance, widely separated, skyrocketing instances, but as a great and coherent group. The group adopts the recent mechanical achievements as a natural heritage of their new status, and in this adoption the automobile stands prominently.

Women appreciate beauty, comfort and chivalric serv-



Mrs. John A. Anderson Wanted Ever So Much to Be the First Woman to Drive a Car of a Certain New Make. She Set About to Accomplish It and Succeeded



Miss Amelia Erhart, of Hollywood, California, an Expert Pilot, Will Try for the Altitude Record for Air-Cooled Motors

ice, so it is not strange that the automobile has met with a large share of their favor. That favor has been merited, because the fleetness and speed of the present-day easily driven car harmonizes in a delightful way with their new sense of freedom.

As we look about, we see them in the new activities. On every avenue of every city and town they appear. On the country highways they speed from point to point as necessity or fancy dictates. Not satisfied with being only motorists, they have also adopted the airplane.

"She stands as free to choose her road, or course of flight, if higher,

As Eve of ancient day without the fire."

The women pictured here have taken an especial interest in the automobile or its fleet brother, the airplane. Without doubt their association will lead on to greater interests.

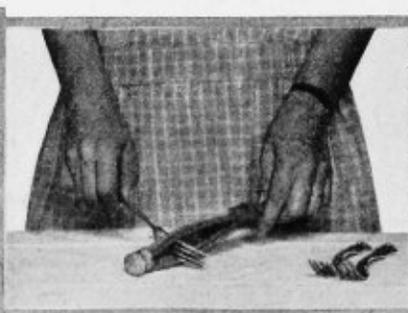


In Winter, Miss Lydia Hutchinson Cracks a Whip Over a String of Huskies. She Won Fame in 1922 as a "Dog Musher" in the American Dog Derby at Ashton, Idaho

Aids to Better Housekeeping



This needle ejector spills out needle desired when cap is turned to number of needle desired

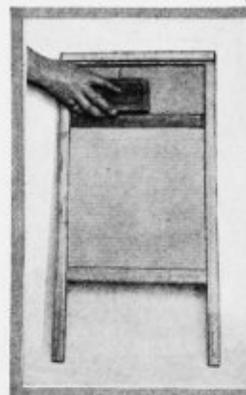
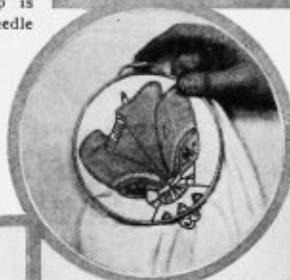


Compound brush gets between tines of forks and cleans thoroughly



Where there is neither electricity nor gas this milk bottle heater for baby is handy. It uses "canned heat"

Right — Embroidery frame is cork lined and has screw to regulate tension on cloth



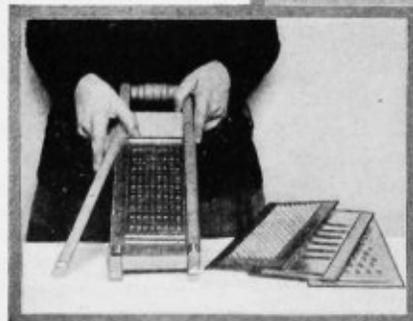
To save clothes and knuckles, this washboard has rubber surface



Center — Smallest dishwasher cleans dishes for four persons in five minutes

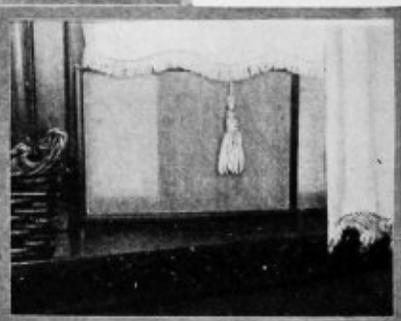


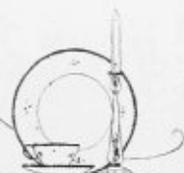
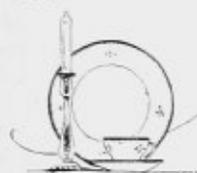
Lifter for milk bottle cap remains on as long as housewife desires



Left — Four different grating surfaces are provided with grater

Right — Metal ventilator has removable and washable cloth center





Some Little Things That Count

It Is Usually After Having Experienced the Result of Not Doing a Little Thing That We Appreciate How Much Easier It Would Have Been to Have Done It. Perhaps You Can Use Some of These Pointers on How to Make Household Work Easier by the Use of a Seemingly Unimportant but Distinctively American Product

By KATE H. HUNTING

SINCE Mr. Columbus discovered America, America has discovered many things for herself. One of these is an aid to good housekeeping that can be turned into a dime and dollar saver. You were told probably that it first came from Paris. Paris produces many original articles, not always gowns and hats, but waxed paper first saw the light of day in America. It was wrapped around the American sandwich before those of other countries — but not around the first sandwich. This was made in England at the suggestion of the Earl of Sandwich after whom it was named many years ago. He was given double slices so as not to soil his fingers at the card table.

The mere

mention of waxed paper always has brought to my mind pictures of summer sandwiches arrayed on summer picnic tables. Since learning of its many other uses this one-sided scene has disappeared. In suggesting the other uses, I have in mind a particular kind of paper—not the paraffin-coated brand that comes in sheets so hard to handle that to get one sheet a dozen are unrolled, but heavily waxed household paper, strong and waterproof,

that comes in a roll many feet long. This is pulled out and cut off much as your grocer or butcher uses wrapping paper. There is no waste. Any length desired can be had in a jiffy. This will be found to be clean and sanitary besides being economical and always ready.



When Purchased in a Roll and with Holder the Paper May Be Pulled Out and Torn Off at Any Length Desired. This Way Is Economical and Very Convenient

Edward Guest tells us that the perfect dinner table is one whose cloth is soiled—but the soil must come from tiny hands



Croquettes Wrapped in Good Waxed Paper Will Keep Fresh and Tempting Until the Next Day

belonging to the little members of a family. It's the kiddies that send the family dinner cloth into the family laundry basket ahead of schedule time. In a home recently, I thought I discovered a great scheme for the prevention of spots. The mother placed beneath small daughter's plate a sheet of this paper as a crumb and spot catcher. Needless to say, it does help to cut down the size of the weekly laundry. Its the little things that count, and this one little thing saves the tablecloth and adds its bit to reducing the soap expense as well.

Kitchen tables and bread boards require just so much work for the removal of crumbs and stains. A sheet of paper spread out over them prevents fruit stains and catches crumbs. These crumbs can then be easily emptied into the crumb jar for future use. Waxed paper spread over the bread board will also catch any stray flour or cracker crumbs.

Groceries must be emptied from large bags into kitchen containers. Try spreading a sheet of this paper beneath the sugar container or coffee can to catch wandering grains as they travel from bag to container. A little thing to be sure, but so many grains of sugar

make a pound, and the amount saved will be surprising. Some of us place a newspaper where it will catch the overflow, but stop and think where newspapers travel. The road does not always lead through "Spotless Town."

What do you do with left over croquettes? Do you know that if they are wrapped in heavily waxed paper they will hold their freshness for the next day? Oranges cut into halves and placed in the ice box without protection dry out quickly, but if covered with a small portion of this paper, they will keep juicy for some time. Many things can be kept in this way.

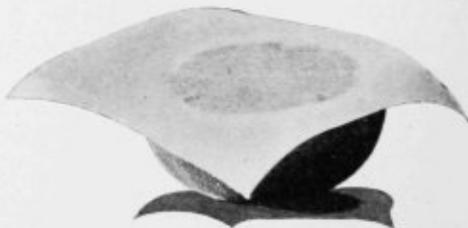
The family medicine glass needs protection from dust and dirt. Why give the germs a chance to swim in liquid that your indisposed one has to swallow? Cover it for the sake of safety.

These are only a few of the other uses for heavily waxed paper. The one



A Few Layers of Heavily Waxed Paper Well Folded About Fish Will Prevent the Odor from Spreading About in the Kitchen

that pleased me most was to know that silver will not turn dark if wrapped in it. Do not do as I did in wrapping the silver. By mistake a rubber band was dropped in with the package. Upon opening it many weeks later, I made a discovery. On several pieces, ugly black spots appeared that were hard to remove. It was explained to me that the rubber did it, just as the yolk of an egg will turn silver spoons and forks dark. It is the sulphur present that is responsible for the tarnishing of



Oranges or Other Fruit Which Has Been Cut in Half Will Not Dry if Covered with a Small Square of the Paper

the silver. The tarnishing is brought about by the active affinity of sulphur for silver, their chemical union producing the dark-looking surface. When the silverware is wrapped in waxed paper, it is protected because of the air-tight nature of the wax.

When you once have a roll of waxed paper in the house, many uses will suggest themselves. The work in each household is to some degree different from that of any other and it may be that your special differences will be those which call for the use of this inexpensive and handy household utility. It is always well to explore new ground for yourself—perhaps your discoveries of newer uses will be just the thing your friend or neighbor has been seeking.

A Square of Waxed Paper Placed Under the Dishes Set for the Child May Save the Laundering of a Tablecloth and Will Also Give a Touch of Scrupulous Cleanliness



The Best Way to Darn Silk Stockings

by JULIA W. WOLFE

PERHAPS the reason so many women throw away silk stockings that are but slightly worn is because they think it an impossible task to mend them. However, it can be done with a little care. We admit it is difficult to darn runs in them so that the darning will scarcely show, but that can be done too, as it is so different in quality from the silk used in silk stockings, darning wool shows plainly when used to darn them. For the very same reason silk thread will not do. The best things to use are hair and ravelings drawn from an old silk stocking. The longest raveling that can be drawn from the woof of a stocking is only 8 or 9 inches long; so if there is much work to be done you will probably have to rethread the needle a good many times.

Suppose the run is on the leg of the stocking. Place it over a piece of glazed paper or over thin cardboard. While you darn, hold the section in place without stretching or pulling, or tack it in place with a few stitches. If the run is in the foot, use a darning egg while the repair is being made.

To darn a narrow run, turn the stocking wrong side out, thread a fine,

long needle with a suitable raveling, moisten your fingers, pass them along the raveling to straighten it and then catch up all the several loops before they can further ravel. Put in the number of warp threads that are missing; if necessary, use one or two extra ones so as to cover the space well. Make the rows straight and keep the spaces even. When you have put in all the warp threads, turn the stocking right side out and thread the needle again with a hair passing the root end through the eye of the needle. Darn in the woof threads and run the woof darning half an inch above and half an inch below the edges of the run. Since the hair will break if it is drawn too tightly, and the raveling will shrink, anyway, leave both of them loose at the turnings, but draw them smooth everywhere else.

When one missing warp thread has formed a run, turn the stocking wrong side out, place the edges of the run together and join them with a row of machine stitching. That will take up the broken part. Then turn the stocking right side out and with a raveling or a hair sew to it the extra material turned in, so only a flat seam remains.

No Cord When Ironing

THE modern electric iron has been a great improvement over the old type of sad irons, but the one inconvenient feature of the electric iron up to the time of the invention of this form of stand and



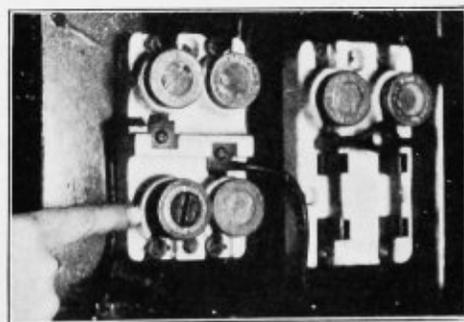
Improved Electric Iron with Special Stand Does Not Drag a Cord Over the Clothes

switch combined has been that the electric cord was more or less in the way while ironing clothes.

This new iron and stand is so made that when the iron is taken from the stand, or rest, connection with the current is broken and the cord remains fastened to the three-legged rest. As soon as the iron is replaced, connection is again made and the iron proceeds to heat for the next piece of material to be smoothed. A smaller plug in the socket of the iron can be withdrawn so that, if desired, the iron will not heat when placed on the stand.

Six Fuses in One

HOW often has a fuse of the lighting circuit blown out and left the house in darkness while you either ran to the



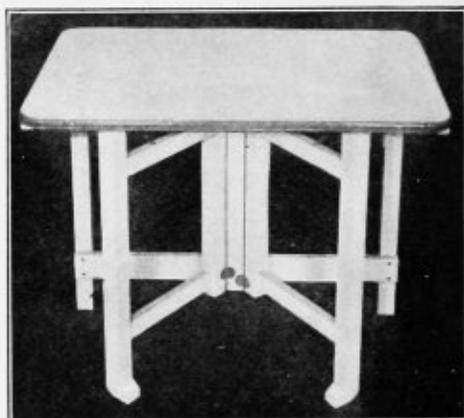
electrician's shop for a new fuse or groped about in the steel-covered fuse

case in the basement trying to discover what was wrong as you screwed or unscrewed the various fuses in the electric sockets of the steel box?

At such a time you would have been glad to have had the new six-part fuse illustrated. There are six fuses in this one fuse. When a fuse blows out, a new one does not have to be replaced in the switch block. It is only necessary to turn to the right and thus make connection to one of the reserve fuses when any difficulty develops.

This invention for the simplification of household mechanics should prove a boon in many homes.

Kitchen Table of New Design



THIS table puts beauty and convenience in the kitchen. Instead of the old-style, rectangular table with wooden top and fixed legs, this is a gate-leg arrangement with an enameled top. The table is especially good for small apartments or crowded kitchens, for the legs and top fold in such a manner as to occupy but a small space against the wall when not in use.

The construction of the table is unusually simple and all parts are rigid and solid when it is put in position to work upon. Materials are of good quality. When enameled white, this new piece of kitchen equipment presents a clean and sanitary appearance.

The enameled top is hinged to the rear legs so that, when the table is folded, the top hides the supporting legs from view and presents a straight, dust-proof surface.

How to Save Money When Shopping

Can You Tell if a Piece of Goods Is All Wool? Is "Bargain Counter" Silk as Good as Other Silk? If Anxious to Get a Fresh Fowl Can You Pick It Out Unaided? Questions to Assist in Making Wise Purchases Are Asked and Answered on This Page Each Month

By MRS. HARLAN H. ALLEN

The greatest objection to a mixture of wool and cotton is the uneven shrinkage of the two, which makes it hard to keep the garment well-pressed and in shape.

Often it is the presence of cotton that causes a wool skirt to become baggy at the knees, and to sag at the back and sides, or wherever there are long seams. Then, too, a large percentage of cotton is likely to give trouble with the dyes, as all colors tend to be fugitive on cotton. Fortunately, it is very simple to determine to your own satisfaction whether there is cotton in a wool sample. Pull out some of the threads and burn them. A cotton thread burns more quickly than a woolen one, and with more flame; wool burns slowly, chars, and smells like burnt feathers. So the one that has the worst smell contains the most wool.

The more accurate tests, of course, are the chemical ones, and the average housewife does not have equipment for making these. But here is one that anybody can try. Dissolve a little caustic soda in a pint of water, and boil your sample in this solution. It will dissolve any wool, but leave cotton unchanged. If your sample is all wool it will be entirely dissolved.

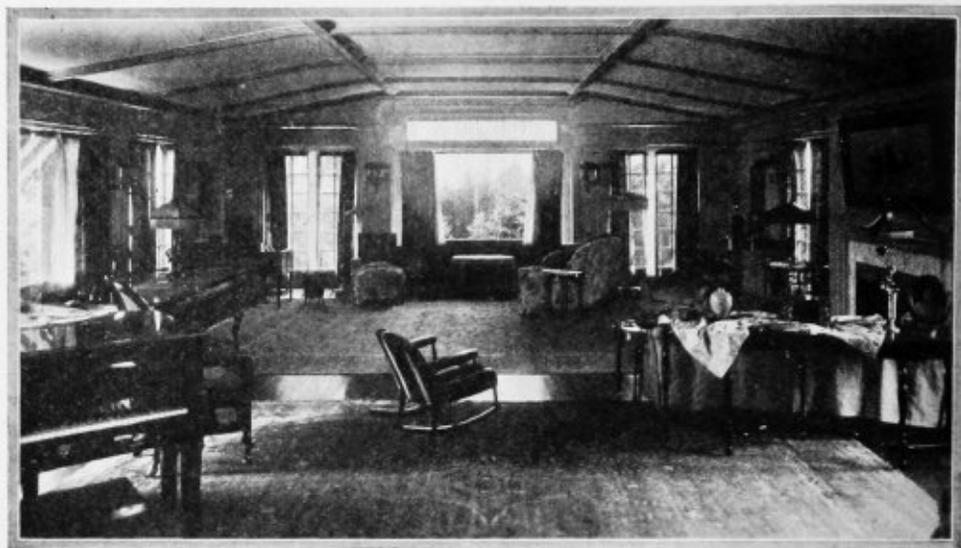
"Bargains" in silk are usually not a wise selection, because the silk is likely to be of poor quality or to be damaged in some way. All silks will rot if kept too long on the shelves of the store or laid away in the bottom of a trunk. Therefore, never buy a piece of silk just because "it may come in handy some day." To buy only when you need it and to suit your needs is a definite precept for the good shopper to follow. For instance, you should consider carefully the purpose for which you want every piece of silk. One weight of silk may

give excellent service in an afternoon gown, but poor service in a traveling or street frock. A piece that would hardly be worth making up into a dance or dinner gown may give perfect satisfaction for a negligee. Soft-finished silks like charmeuse or messaline will not crack or split so quickly as taffeta. To expect a fine satin to wear well on country jaunts, or when dragged in and out of street-cars, would be foolish; while jouncing about on hard motor trips breaks a taffeta into thousands of little creases and takes the life out of it. Crinkled crepes come through such ordeals much better. Of course the idea is not to suggest which silks to buy, but to impress upon every shopper the importance of giving real thought to the question of suiting the silk to the use she wishes to make of it.

There are many signs by which the housewife can tell a young fowl from an old one. Choice fowls have clear, yellow-colored skins, free from blotches.

When the skin is full of pin-feathers, the bird is young. The breastbone of a very young bird will slide easily from side to side; if very brittle, the fowl is probably about a year old; if hard and tough, much more than that. Before offering the fowls for sale some dealers, whose customers are "on" to this test, break the breastbones of their old birds. In that case, examine the feet. On an old fowl they will be hard and rough, while on a young bird they will be smooth, moist and flexible. Look for short, sharp claws on a chicken's feet. Claws will grow long and blunt with age.

You can generally tell cold-storage fowls by their "squeezed" appearance, caused by their having been packed close together.



Modern Home Decoration

Artistic Treatment of Interiors and Furnishings

by ODA ALEXANDER

LARGE and spacious is the living room pictured. The walls and ceiling are attractively paneled. At night the room is lighted by the wall sconces fitted with silk-trimmed shades, and auxiliary light is obtained by decoratively placed electric floor and table lamps.

Windows are large and numerous while French doors add further light and draw the vision out to the beautiful foliage and gardens which surround the house. Colorful hangings at the windows, which here are frames for tempting views of the outdoors, make artistic borders for the splendid nature pictures.

The room is large, and while there is plenty of furniture, there is no sense of any crowding nor of a too-regular effect. The deep-cushioned chairs, *chaise longue* and sofas give an air of luxurious comfort which is further enhanced by the attractive spread of the two warm-toned Oriental rugs.

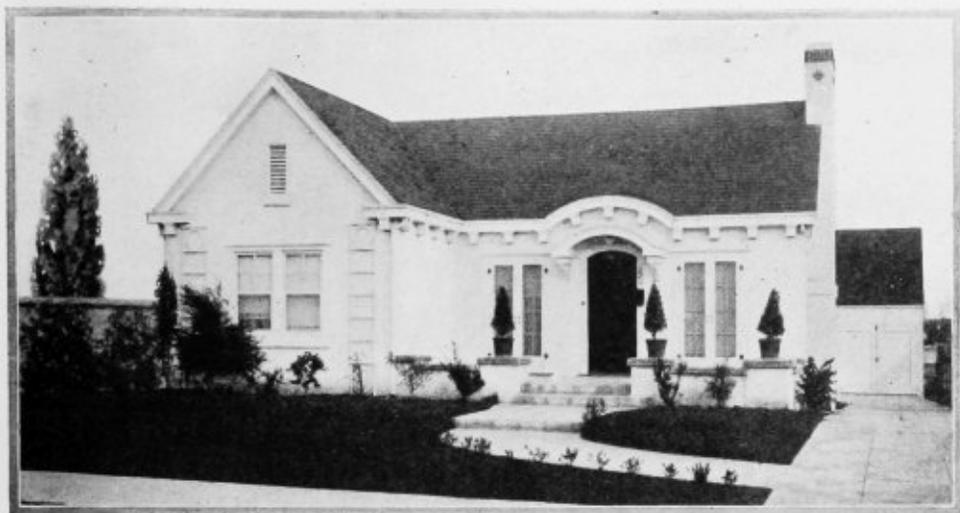
At nearly right angles to the fireplace is a luxurious sofa, backed by a long, graceful davenport table. The table and sofa arrangement breaks the stiff, set form of *passee* wall placement.

The arrangement of the furniture is such as to preclude any impression of stiffness or stiltedness. An especial feature is the placing of the piano. It is so arranged that the musician faces the persons in the room, tending to sociability and friendliness. Ornaments are few and simple—of unimpeachable quality.

Colors are in harmony with the blazing color wave that swept over America in recovery, it would seem, from the expressionless black and white of the war period. Colors are found in rugs, furniture coverings, hangings, decorations, lamps and also in the ornaments of finished touch.

The previous monotony of white curtains has been enlivened by tints of ecru, orange or green. Even the more conservative hangings have followed this spread of color. The bright shades call for the newer furniture, china and rugs to harmonize. The total effect of this has been to create a happier, healthier impression by the colorful unity.

Bright and lively shades now appear everywhere—not only in decorative schemes but also in art.



A Stucco Bungalow in White and Green

by CHARLES ALMA BYERS

SIMPLE in structural line and in color scheme, the little bungalow shown above presents an especially neat and attractive outside appearance. It also has a very desirable floor plan. In fact, it is an unusually pleasing and practical little home in every respect.

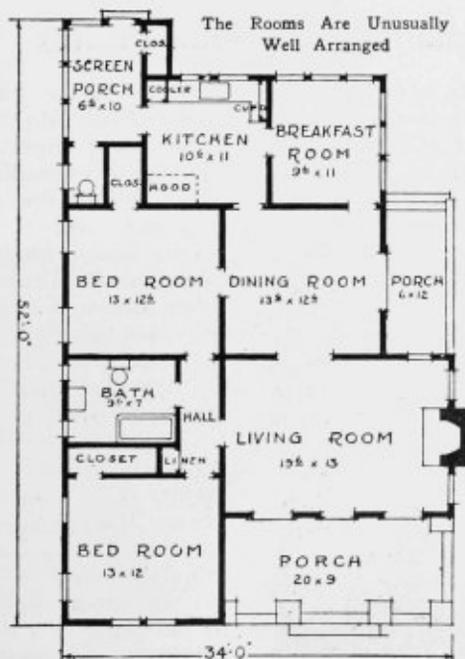
The house is of frame construction, with the outside walls finished with cement-stucco. This stucco, as well as all wood trimming, is painted white, and the roof of wood shingles is bright green. Lending a touch of contrast to these, the low walls and piers of the front porch are coped with red cement and the top of the chimney is decorated with a band of red brick.

The floor plan shows a living

room, a breakfast room, a kitchen, two bedrooms and a bathroom, besides the usual rear-entry porch. The living room and dining room are connected by a pair of glass doors, and a short hall, reached from the living room, communicates with the bedrooms and bathroom.

Each of the bedrooms possesses a good closet, and a small storage closet is a feature of the rear-entry porch. In the hall is a special linen closet equipped with shelves and drawers. In the kitchen are built-in cupboards, a draft cooler closet and other conveniences.

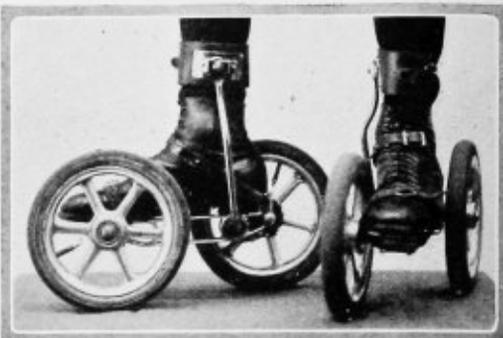
The interior woodwork consists of pine throughout. In the living room, dining room, breakfast room, hall and bedrooms, the finish is old ivory enamel.





A Novel Sporting Vehicle

HERE is something new in the way of sport. It is not a small bicycle nor is it a large pair of skates, yet either term would describe it roughly. It is called the pedmobile and is light and portable like a pair of roller skates. Weighing from four to six pounds, according to size, the device glides



over the ordinary road like a good bicycle or pair of bicycles.

With the pedmobile, it is possible to make great speed over a smooth road and to secure excellent exercise for the legs and trunk muscles. The wheels are 8 inches in diameter with pneumatic tires pumped up to more than 100 pounds pressure.

It will be noticed that each pedmobile has an ankle brace to eliminate the weariness that comes from ordinary ice or roller skating. This brace acts as a brake arm, allowing perfect control at all times. The brake is thrown on by a slight forward movement of the foot. The wheels run on ball bearings.

Baffling the Film Pirates

THIS zealous axman is not practicing sabotage, nor is he venting an angry grudge against the movies. He is paid by the studio to do this constructive work. The rolls of positive film here being destroyed are being so mutilated to prevent their being



re-shown after having been retired from circulation. They are being hacked into short lengths to prevent their use by unauthorized dealers who would ignore the embargo placed on worn-out film.

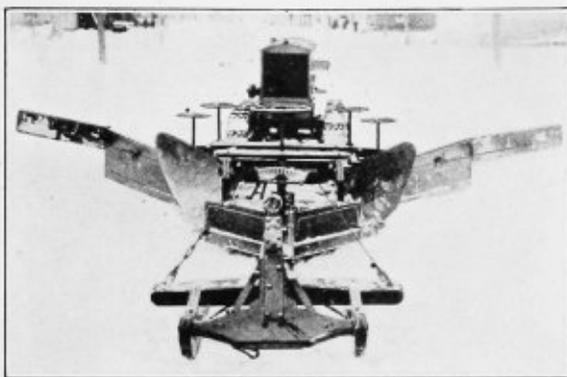
This heroic method disposes effectively with flickering, scratched or faded film and insures the showing of only clear and perfect pictures. This batch of film is not a total loss, for it is later sent to a refinery which salvages the silver in the emulsion. The silver salvage of this lot of films will net about seventy-five dollars; originally, they cost hundreds of thousands. The public was willing to pay more than this for the popular entertainment once offered.

Undoubtedly this means of disposing of old films is a distinct benefit to the public as it guarantees new pictures.

Huge Tractor-Pushed Snowplow Clears Roads in Michigan

A SNOWPLOW, developed in Michigan, was designed primarily for the work of clearing county roads in the northern states. However, it is so constructed that it permits of a wide variety of work. By a simple adjustment the plow makes roads for motor traffic or for sleighs of any width. It will plow the snow to the dirt or pavement or will leave a bank or roadbed of snow of any height.

The plow has a wing spread of 12 feet, or rather, it throws the snow plowed 6 feet from either side of the road. On either side of the fore-running sled are two huge plow shares which turn the snow. Set at any



A Plow of This Kind, Operating from Each Rural Community, Would Greatly Assist Road Clearing in Times of Heavy Snows

desired angle are wing boards which further carry the snow to the side of the road. The huge plow is pushed by a caterpillar tractor. One man is required to operate the tractor and another to operate the plow.

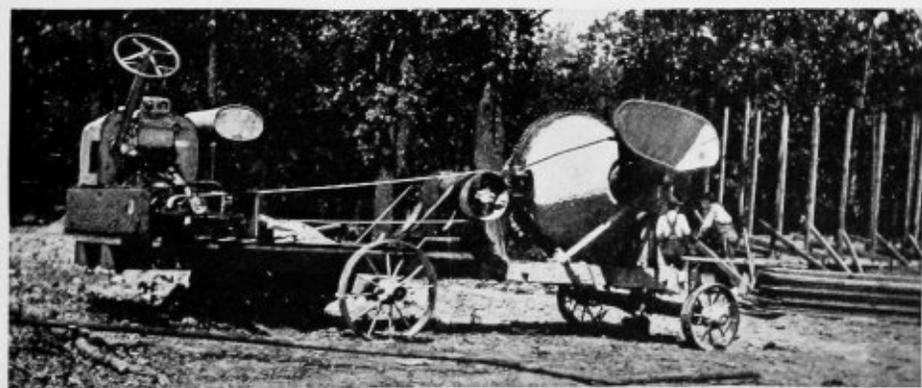
Auto Engine Supplies Concrete Mixer Power

IN an out-of-the-way place, where no ready power was available, it became necessary to mix and pour several hundred cubic yards of concrete. The problem of how to mix the material was solved by connecting up an automobile engine to a standard concrete mixer as shown in the illustration. The engine, transmission, radiator, steering post, starter and battery were taken from the automobile and bolted on 10-inch channel irons fastened to the mixer frame.

To operate the equipment, the engine was first started and the load

picked up in low speed. Power of the engine was then increased and the load engaged into high speed exactly as in road driving. The speed was held constant by adjusting the throttle lever. A stream of water from a small hose was allowed to run through the radiator while the engine was in service.

With a load of $\frac{1}{4}$ to $\frac{1}{3}$ cubic yards per mix, 80 cubic yards were mixed and poured in twelve hours' running time per day for a period of several weeks.



The Boys' World in Pictures



For real sport take poles, box, roller skates, cloth for a sail and a boy to put them all together — then ride



This is a good way to inflate your football at the spare tire of Daddy's car but be careful not to burst the football. That would be a sad noise



John Henry, Jr., of the movies and the wonder-dog Teddy, use a radio outfit. Notice that both are smiling? Are they hearing good news from all the boy fans?



William Steinmetz has set a large number of ice skating records and is the hero of many boy skaters



Eddie Hoff is a sharpshooter. He handles his rifle better than most men, hitting 15 clay disks with only 15 shots



This motorcycle rider is popular with the boys of his neighborhood. He pulls a whole string of them over the ice. Lots of fun for everybody



SKIS AND SKIING

by H. M. LEWIS

SKIS have not yet reached the height of their deserved popularity but they are rapidly doing so. They originated in Norway, where they were first used as a means of travel by men who wended their way over the snowbound hills of the north-land.

The best ski is made of ash or hickory. It must be very accurately made so that it will travel straight and true, and for this reason the amateur should always begin with a perfect pair. Balance is also important as it assists in the manipulation of the ski when turns are made.

Skis are from 5 to 8 feet long, about 4 inches wide and curved upwards to a point in front. The right length for a user is determined by stretching the hand over the head and selecting a pair that will reach to the wrist. "Long" ski will reach to where the fingers bend at the second joint and "short" ski will reach to six inches over the head. For general use the short ski is best—especially for short-legged travelers who would be unable to manage the long ski to good advantage.

The ski is slightly wider at the front than at the tail and the wearer's foot

is placed at about two-fifths the distance from the back of the ski. The skier is equipped with one or two staffs with which to steer, balance and assist in forward progress when there is no momentum from descending a hill.

The four most important movements to learn in skiing are darting, steering, braking or stemming and the snow plow. Darting is to run downhill with skis close together and parallel. Steering is accomplished by leaning toward the side which the traveler wishes to go. Braking or stemming is done by getting one ski at an angle to the other so as to retard forward movement. The snow plow is the turning of the knees and feet inward to bring the ski points close together and the rear of the skis far apart, at the same time turning the flat of the ski against the snow to produce a quick stop.

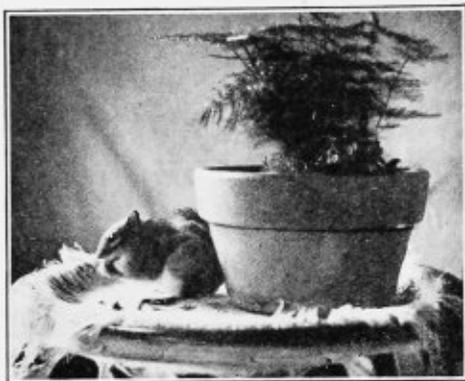
It is best for the beginner to practice going uphill first as in this way he becomes accustomed to the action of the skis before attempting any gliding down hillsides or slopes.

This outdoor winter sport offers a wider field of activity than skating. A skier may travel on long cross-country tours to suit his pleasure.

Interesting Things for the Youth

A Happy Chipmunk

THIS little chipmunk and another were caught in the woods with a trap and brought to Buffalo, about seventy miles from the place of capture. They were kept as pets for more than a year. A large, well-built cage with fresh earth and vegetation in its bottom was re-



sponsible for their good health. A terrible fight took place between them and resulted in the death of the one not shown. The remaining one became quite tame, as can be seen, and would eat cake

and ice cream. Nor did it mind occasional petting—careful petting prudently given.

The next camping trip of the boys who captured the chipmunks was to the same locality where the little animals had been caught. The boys did a very generous thing; they took the little chipmunk along with them and set it free on its old stamping grounds.

A Strange Nest

UP on the cornice of a house a boy found this peculiar-looking hornet's nest. It was so interesting that he took a picture of it. A hornet's nest sometimes has a spout for an entrance but it is usually cut off when the nest is small. This nest was about five inches wide at the big diameter.

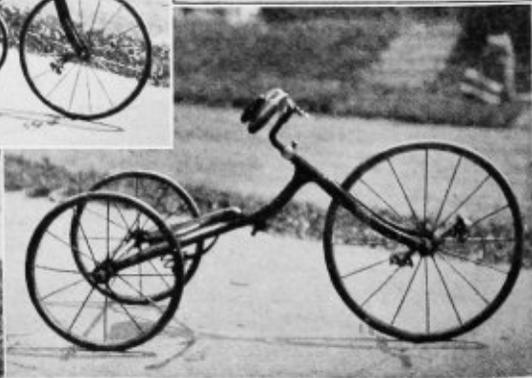


How to Convert a Velocipede into a Racer

SIMPLY loosen the screw that holds the handle bars in place and take off the bars. Then remove the nicked sleeve so that the entire front wheel and the fork may be taken off. Remove the saddle and turn the rear part of the

velocipede frame upside down. The fork should now be reinserted and the nicked sleeve replaced, after which the bars may be put in position and tightened securely.

By placing the saddle on the frame and tying it in place, the racer is completed and ready for the fun.

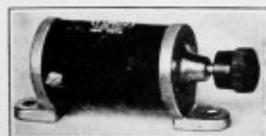


RADIO OFFERINGS

Self-Adjusting Crystal Detector

The objection on the part of everyone to the ineffective method of searching over the face of a crystal for a sensitive spot led to the development of this self-adjusting detector stand. To adjust it, all that is necessary is to pull out the sliding arm and let go. The design and construction is such that it is impossible

for the arm to go back into place without finding proper contact. Any mineral desired may be used



with equally efficient results, although the instruments are furnished with a tested silicon crystal.

The simplicity of adjustment will instantly recommend this piece of equipment to all users of crystal detectors. The metal ends are die cast and nickel plated. The adjustment arm is of brass and the black casing is polished so that the unit presents an attractive appearance.

Battery Charger in the Home

Enjoyable radio concerts and maximum receiving range are obtained only when the battery is fully charged. The inconvenience of taking the battery to a service station for charging has been made unnecessary by this rectifier. It charges the battery over night without removing it from the room. It is only necessary to attach the cord to any electric socket of the house and then connect the two terminals to the battery. The charger is fully automatic in operation and cannot overcharge or injure the battery. The parts are enclosed in a neat, smooth case finished in antique mahogany.



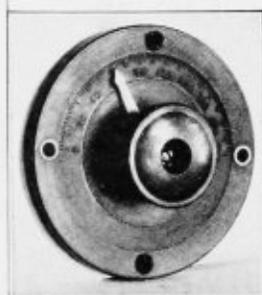
The good appearance of the charger makes it look well in the livingroom. The bottom has rubber feet so that it will not mar polished surfaces.

Compact Variable Condenser

This radio product represents a distinct advance in variable condenser construction making possible as it does the crowding of a large capacity into a very small space. In place of air, mica is used as a dielectric, and since the dielectric constant of this substance is very high, but one movable plate is necessary.

With this arrangement it has a capacity equal to that of the average 43-plate condenser of usual construction and occupies only the space needed by a tuning dial.

By the use of a very simple attachment supplied with the instrument, it may be used on the front or back of the panel. The condenser allows very sharp tuning and obviates the necessity of a vernier. It is supplied in capacities ranging from .0004 to .001 mfd. The size is 3 inches in diameter by $\frac{1}{4}$ inch thick. It has a molded case over which the pointer plays on a scale laid out on the upper surface.



Static Elimination in Radio

During the summer and fall months "static" is the despair of the radio fans, especially those using crystal sets or outdoor aerials. This may be largely eliminated by use of a simple little device that costs practically nothing but a few minutes' work.

Two binding posts which have holes in the screw portion are set $2\frac{1}{2}$ inches apart on a small base. Place a large needle in each post, clamping them firmly, with just a hairbreath separating the points of the two needles.

Connect one post to your aerial and the other to the ground. In this way all small charges of static are led almost certainly to the ground without affecting the instruments, is the claim of one writer and experimenter.



Making a Double Service Bench

by ALLEN JAINBY

THE purpose of this bench is to provide a handy bath stool and at the same time have a bench with a concealed receptacle that will hold the brushes and blacking used for shining shoes.

Such a bench is not difficult to make. It requires but few tools such as most boys have in their own shops or, if not, they can borrow from their Daddies. The tools required are a rule, a square, a hand saw, a coping saw, a plane, a drill, a hammer and nails.

A 12-inch board about 7 feet long will provide all the wooden parts of the bench. When the board is purchased at the lumber yard, it will be found that when planed or dressed it will measure about 11½ inches wide and ⅞ inch thick. The board should be of soft wood.

It is always best to use soft wood because hard wood splits easily and is difficult to work with.

Mark off on the board all the dimensions shown in the lower illustration on this page and cut away all the shaded portions. *A* and *A* are the two ends and also the legs; *B* and *B* are the two sides; *D* is the swinging top or cover; *E* is half of the top which permanently fastens on; *C* is the crosspiece for the

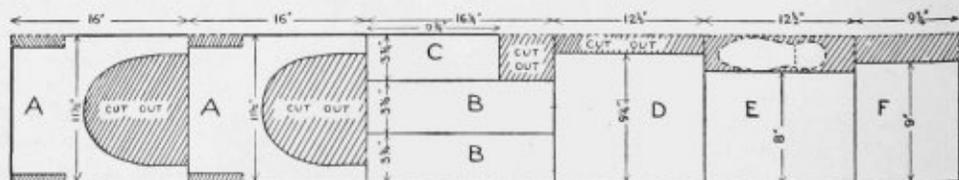
receptacle and *F* is the bottom of it. If the measurements are carefully followed, all parts needed for the entire bench may be cut from the board.

After the parts have been cut, it is necessary to dress them down to a smooth edge with a plane. Care should be taken not to trim off too much or they will not fit very well. The upper illustration on page 125 will show how the two ends should be handled.

First, drill a hole 10 inches from the bottom of the legs as shown, take a piece of paper 8½ by 10 inches and fold over the long center so that it measures 8½ by 5 inches when folded. With a pair of shears cut a curve as near as possible to one-half of the arch, equaling the curve from the bottom of one leg to the drilled hole. Unfold the paper and you will have an arch that is the same on both sides; lay this on the pieces *A* one at the time and mark around the curve of the paper so as to pencil the curve on the board and making the legs 1½ inches wide at the bottom.

Mark the arches carefully for they are the only curves on the bench and therefore should be well done.

With a hand saw, make a straight saw-cut to the drilled hole as shown in



All the Parts for the Bench May Be Marked Off on a Single Board 11½ Inches Wide and 6 Feet 11 Inches Long. The Shaded Portions Shown Should Be Cut Away and the Board Sawed Up into the Separate Parts A, A, B, B, C, D, E, F and Shape of Shoe

the illustration. Two such cuts will saw out a triangular piece of wood so that there will be room to manage a coping or scroll saw which will cut the arch. If two extra, short cuts as illustrated are made up to the curved pencil mark it will be easier to handle the small saw which cuts the arches. Notches of the same depth as the thickness of the board, $\frac{7}{8}$ inch, should now be cut at the tops of the ends, *A*, to receive the sides. This completes the two ends.

E and *D* should now be smoothed and rounded off on the edges which face outward on the bench top. Care should be taken that the two edges which are later joined together with hinges be straight and even.

The bench is now ready to be assembled. The two sides should be set in the notches of the ends and nailed there. Be sure to use finishing nails, the kind that have a small head, because the heads can be set into the wood and later filled in with putty.

After the sides have been nailed on, the center section *C* should be put in place but not nailed before the receptacle bottom *F* has been set in, so that the two pieces will fit together neatly and form a receptacle with no gaping holes. These two should then be nailed, being sure that the cross-piece, *C*, is level with the

top of the sides *B* and *B* as is shown.

Now nail on the half top *E* over the open space which has not been enclosed by the receptacle just made with *C* and *F*. This half top *E* should project about $\frac{1}{2}$ inch all around the top of the bench to form a neat edge, previously rounded smoothly.

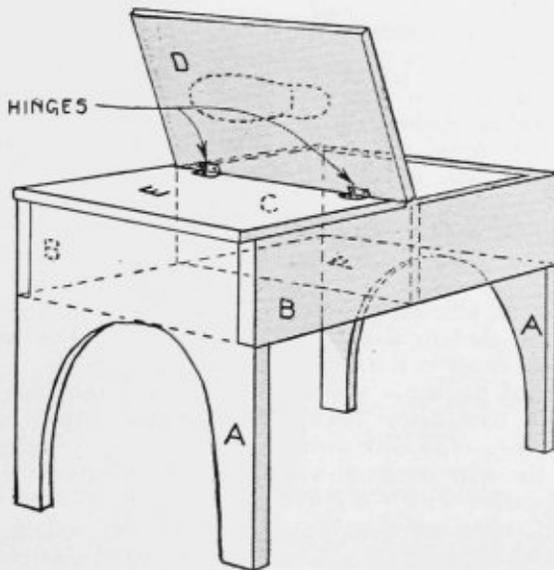
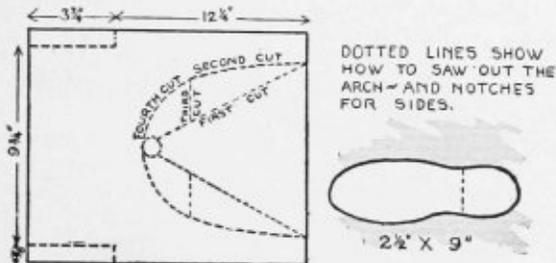
Fit the other half of the top, *D*, into place. This half of the top should project over the sides and end of the bench in the same manner as *E* so as to

form a continuous edge. If the edges of the top *D* do not exactly conform with those of *E* they should be dressed or planed so that they are the same. When the cover fits well the hinges may be screwed into place.

The shape of the shoe, cut from the board, should now be nailed to the center of the swinging top—on the inside. When the cover is folded shut the top will be smooth.

Now all rough edges should be planed or sand-papered smooth so that when the

bench is painted it will present a well-fitted, even appearance. The best kind of paint to use for the first coat is white lead paint. The second coat should be enamel undercoat which is a cheaper paint but better for the purpose. Sandpaper the bench well between each coat so that when you put on the finishing enamel it will look well.



Completed Bench with All Parts Assembled and Ready to Receive Two Coats of White Paint and a Coat of Enamel

Garret Aerial and Loose Coupler Receiving Set

By G. A. LUERS

THERE are some objections to the outside aerial as a possible source of danger in lightning storms. An indoor aerial, such as is illustrated in the attached sketch, can be installed inside the garret, when it is desired to avoid exposed wires. Three lengths of No. 14 copper wire strung the entire length of the garret are attached direct to the rafters or if small insulating knobs of rubber or porcelain are handy the wire is placed on these and then nailed to the roof rafters.

Each wire will be about twenty-five feet in length, or longer if the space will permit. This is a simple aerial to install. It will not be blown down or pulled down by ice accumulating on the wire. Have the three strands all in the same direction and about equal distances apart. The three ends are joined and a lead down wire is brought from this place to the receiver set. This wire should be kept clear of metal or iron pipe, with similar insulating knobs if these are used on the aerial.

For use as a ground, a piece of pipe or iron rod about two feet long is driven down into the ground, either in the cellar or at some spot around the house where the water from the roof drips down, keeping the earth moist. The wire used for the ground is the same material as the aerial — No. 14 copper wire — and to insure good contact, after winding this about the top of the pipe, use a small clamp to make it fast on ground spike.

A simple design of loose coupler is

shown in detail in the attached drawings and can be made up from white pine as the base and supporting ends for the wire-wound cylinders. These blocks of dry white pine are cut to the dimensions shown in the drawing and are fastened by small screws to hold them securely together. While small nails can be used, care must be taken in driving the nails to avoid splitting the wood. The small

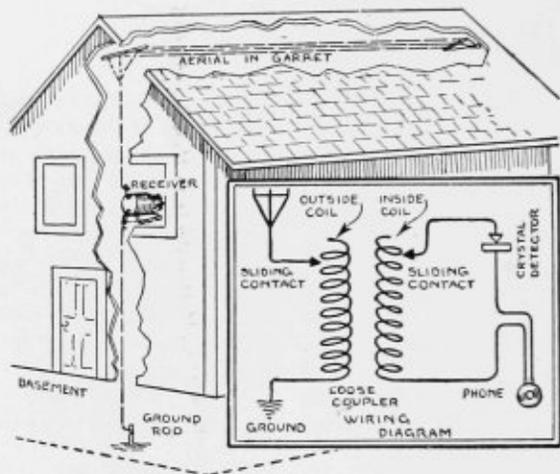
round disks for the cylinders are also of white pine or other dry wood.

Cylinders should be of heavy paper, wound around some circular form, like a bottle, with a thin shellac as a paste to hold the layers of paper. After winding the layers of paper, with the shellac applied

between the layers and eight or ten layers of paper in the form, a string is placed over this and it is placed in a warm place to dry. The result is a stiff cylinder around which to wind the insulated wire.

Put the disks in each end of the cylinder, secure with small tacks, and wind on each cylinder about one hundred and fifty turns of good No. 20 cotton- or silk-covered wire. The number of turns about the cylinders is not very important, but be sure to put on as much wire as can conveniently be placed without crowding or overlapping. The more turns, the greater the adjustment and the finer the coupler can be tuned in.

The smaller coil is mounted on two small brass rods between the end blocks, through snug-fitting holes in the end disks of the inside coil. A small knob



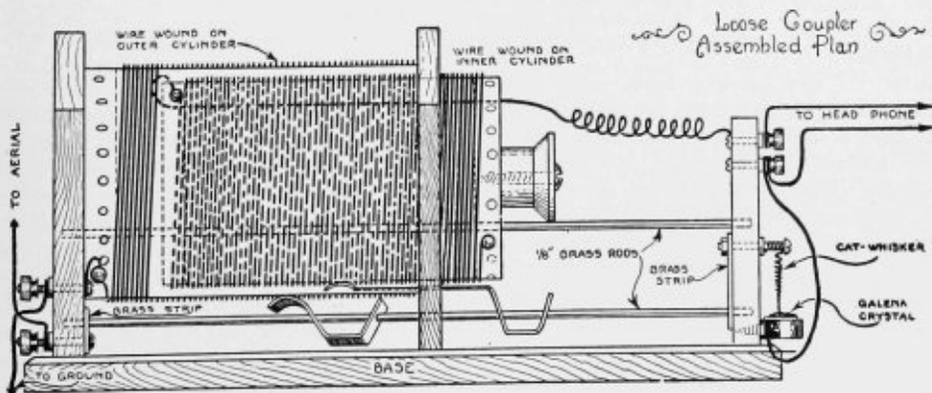
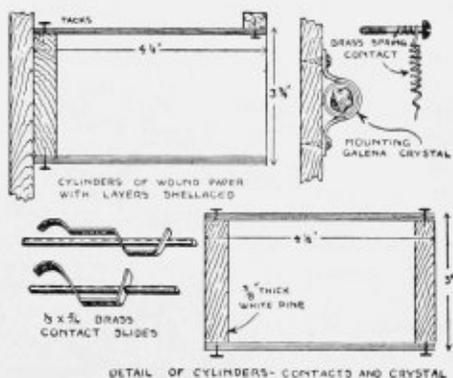
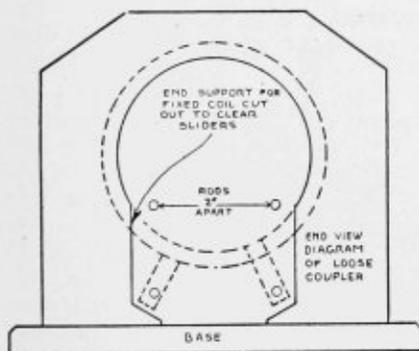
Showing Layout of the Garret Aerial and Giving Readily Understood Wiring Diagrams Which Are Easy to Follow

on this cylinder made from a spool is for pulling out or pushing in. One end of the coil is brought through the disks and with some slack wire to permit of its being moved in and out this is connected to a binding post.

The sliding contacts which are made for use with the coils are simply thin pieces of brass, with small holes at the ends to slide on the rods while the contact is made to the coils at places made bare by rubbing the insulation off, lengthwise of the cylinders, with a piece of sandpaper on a block of wood. Rub enough so the brass strips will be sure to rest on the bare wire as this is important. A small galena crystal, with a contactor or a very fine brass spring to bear against the face of the crystal, is secured to the end of the coupler frame with a screw. A small brass strip holds the crystal directly under this. The terminals shown can be removed from the

tops of dry cells and will serve nicely, though any small brass bolts can be used for terminals in place of these. A small head telephone, which must be purchased, is connected into the set. This part will cost from three to five dollars, depending on the type, but a 2200-ohm head set costing four dollars will give very distinct sounds.

Make up the connections as shown in the small diagram, being sure to have all the contacts screwed up. Move the inside cylinder out very slowly and listen in at the telephone. When a signal is caught, make the adjustments in the sliding until this sound or signal comes in at its maximum strength. For a radius of one hundred miles this receiver will give very satisfactory results. It will prove an endless source of interest in experimenting with the adjustments to obtain signals in their loudest tone from distant broadcasting stations.



Loose Coupler Complete with Wire Leads Plainly Set Forth and (Above) Smaller Details of the Outfit. This Radio Set Is Very Simple in Construction and Any Boy Can Make It

Mono Runner Sled Provides Exciting Sport

Here Is a Chance for Speed in Plenty on the Toboggan Slide or Hillside

ANY boy who is adept at riding a fast bicycle will appreciate the sport to be obtained with the mono runner balanced sled illustrated in the drawings on this page. With a long hill or a well-packed toboggan slide, far better speed can be obtained with this scooter than with the fastest bob sleds. The freedom with which it glides over the frozen path is the reason that unusual balancing ability is required of the rider to keep upright. Concave runners are indicated to provide a definite gripping against the ice. This is often done with hockey skates, giving the skater better control.

In the design of the mono runner sled, the parts have been made with consideration to the limited facilities that boys generally have available. The frame and connections, in-

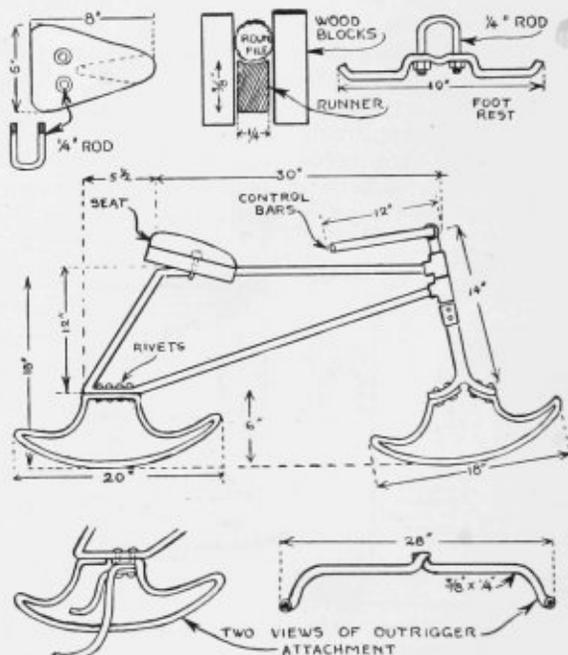
clusive of the control bars, have been made of light iron pipe sections—material that is used in gas lines and electric wire conduits. The sled runners are made up from rectangular sections of bar steel stock. The dimensions can be varied to use sizes differing from those shown, but it is desirable to build the sled as light as possible.

The tools required consist of a drill, pipe cutters, threading dies, block and hammer for flattening the pipe and bolting the ends of the runners. In addition to screwing the parts together, rivets must

be used at these joints to keep them from turning back or loosening.

The main frame is made up from one piece of pipe and the "T" pipe couplings screwed on before putting the threaded connecting pipe in for the front guide bearing. The control handles are one piece riveted at the center to the "T" connection. The upright attachment to the guide runner is fitted with a collar

to support the frame. The attachment to the front runner is simply made by splitting the pipe and making a riveted connection. A bicycle saddle makes the most comfortable seat, though a triangular block with cloth padding can be made and bolted to the frame with a U-shaped bolt. At the forward bearing, a crossbar forms a foot rest, which will add to the riding comfort.



Made of Iron Pipe, a Length of Bar Iron and a Saddle, This Single Track Steering Ice-Bicycle Will Give You Some Real Thrills When You Become a Master in Controlling and Riding It

To groove the runners, a round file held between two blocks of wood can be held against the runner and worked lengthwise of it to cut away the center metal. Practice balancing this sled on some short slope in the back yard before venturing on the long, steep glides. If you feel unsafe and doubtful of mastering a full control of the scooter, two small outriggers can be added to the rear runner. Each outrigger should be about 2 inches above the ground and about 14 inches long so that the scooter will not upset very easily while you ride.

HAVE YOU HEARD THIS ONE?



A TEACHER remarked, admonishingly, to a backward pupil, that, at the pupil's age, Lloyd-George was head of his school.

Whereupon the pupil remarked that, at the teacher's age, Lloyd-George was Prime Minister.

✧

POLAND's new president, M. Mieczslaw Wojciechowski, will be lucky if he's not assassinated by some maddened linotype operator.—*Nashville Southern Lumberman.*

✧

EVERY speaker at the dinner had boosted the town, which was inland some 800 miles from the coast. The speakers all said that had the city been on the coast it would have been the world's first city. The visiting speaker was called on next and said:

"Gentlemen, I am impressed with your city as much as you are and believe that I can suggest a way in which you can get your wish."

All leaned forward. The speaker said, "This is what you should do: Obtain a large pipe, run it from the center of your city into the ocean and if you can suck as hard as you can blow, the ocean will soon be in your city."

✧

WESTERN paper says the wild West bandit has died out. He hasn't. He has merely moved East.—*New York Evening Mail.*

✧

MR. JENKINS—"Edith, didn't I ask you a week ago to oil those casters? They creak something awful."

Edith—"I know you did, but there is not a drop of castor oil in the house."

✧

WHAT we would like to see is a real cure for baldness that can't get pushed over on one ear when you take your hat off.—*Washington Post.*

ABOUT an hour after the children had been sent to bed, Dad heard Billy, the younger, screaming at the top of his lungs.

Dad rushed upstairs and into the nursery.

"What's the matter, Billy?"

"Johnny scared mē-e-e!"

"How?"

"He said a big bear was goin' to get me."

"That's nonsense. There are no bears within a hundred miles of this house. Go back to sleep like a good boy."

Dad returned to the living room, relit his pipe and settled down with his book. Almost immediately there was renewed yelling from the nursery.

This time Dad took the stairs two at a time. It sounded serious.

"What's wrong now, Billy?"

"Ow-w-w-w! Johnny says that a hungry bear can run a hundred miles in five minutes."

✧

THE 1922 award for subtle flattery should go to the New York burglar who raided a poet's apartments.—*Long Island City Star.*

✧

"THE wrist-watch has done much for our trade."

"Where is your trade?"

"It is mainly in Africa. Formerly we couldn't sell a native a watch because he wore no pockets to carry it in."

✧

ALARMISTS seemingly regard the rising generation as a falling one.—*Princeton Tiger.*

✧

AN American once wrote to Kipling, saying:

"I hear that you are retailing literature at one dollar a word. I enclose one dollar for which please send me a sample."

Kipling did. He kept the dollar and wrote, "Thanks."

Two weeks later the American wrote, "Sold the 'Thanks' anecdote for two dollars. Enclosed please find forty-six cents in stamps, that being half the profits on the transaction, less the postage."

✧

ABOUT all that Europe has seen of the peace dove is the bill.—*Washington Post.*

✧

HEN—"Yes, I have met your wife. In fact, I knew her before you married her."

Peck—"Ah, that's where you had the advantage of me—I didn't."

Building Your Automobile Tire

(Continued from page 101)

ing to keep it from sticking together. These rolls of tread stock go up to the cutting room, where they are cut into the proper lengths for the tire size and built together, layer upon layer, beginning with the widest and decreasing the width until the desired tread thickness is obtained. They are then ready for the tire building room.

Let us take another look at the calender, for it is doing another job now that is more interesting than sheeting tread stock. It has three rollers instead of two as the mixing and warming mills have. A roll of fabric has been brought up and is being fed into it. At the same time a batch of friction stock which has passed through the mixing and warming mills is also being fed in, and at each revolution of the rollers their relentless pressure forces the friction stock into the fabric. This operation is known as frictioning the fabric and here the tire gets the toughness, as well as the resiliency, to withstand the strain and wear of the road. These rolls of frictioned fabric go to the cutting room where they are cut into the tire lengths (the knives set on the side of the calender have already cut the fabric into the desired widths) at a 45-degree angle. The calender also sheets the rubber for tubes.

Another thing enters into the making of the tire and that is the bead. On the straight-side tires wire is used in the bead to keep the tire from jumping the rim. On the clincher tire the bead is made from semi-hard rubber which allows the bead to stretch when it is being pulled over the rim. In building the bead for the straight-side tire, flat-braided piano wire is wrapped with fabric and rubber and then semi-cured in the hydraulic press where 1500 pounds pressure gives it the triangular shape. What is known to the trade as reclaimed rubber is often used in the bead where a hard rubber is wanted.

Now let us go to the tire-building room and watch the various parts, which we have just seen made, being built up to form the whole. Let us see them being assembled into one unit. The operations may be done by hand (whence the name "hand-laid" tires) or they may

be done by machine. Here we see large iron forms—cores—of various tire sizes which are so set on heavy iron arms that they can be locked firmly in either a horizontal or vertical position (which ever may be handiest for the particular operation taking place). If the tire be a "hand-laid" one, the operator takes a layer of fabric and pulls it firmly and smoothly over this core leaving never a wrinkle or woe betide! Usually two layers of fabric are placed smoothly down, then the bead is placed on these and firmly locked in place by the next layers of fabric. Various tires are built differently at this point. Layer after layer of fabric goes into place smoothly and firmly over the last layer. This is the building of the "carcass." Perhaps a "chafing strip" is next put on in the effort to completely eliminate rim cutting. Next comes the breaker strip which is placed directly under the middle part of the tread. The purpose of this strip is to bind the soft, pliable tread to the carcass and still not interfere with the resiliency of it. If an inferior "breaker strip" be used, or if it is not bound firmly to both carcass and tread, we have the result known as tread separation.

After the breaker strip has been applied, then comes the cushion strip of pure gum rubber which extends from the breaker strip well down to the edge of the side wall—one on each side of the tire—holding the whole firmly together, still permitting of the greatest possible resiliency. Now we are ready for the strips of side wall to be applied. These protect the inner layers from water, dirt and oil, and at the same time are tough enough to withstand gouging and tearing and yet pliable enough to resist the scraping along a curb. Last of all comes the tread—it is yet to meet the grime and grind of daily wear. Carefully the whole has been built together, with never a wrinkle, or rough spot, each part put in to do a particular thing. But, oh, how easy it is to be just a bit careless in the workmanship! It will not show until the tire goes onto the road—then something gives way.

This complex thing of many parts— all so carefully built—is not yet ready

to act as a unit. It must now be locked in particular mold (here is where the design is put on the tread) and along with several others of its kind, go into a huge vulcanizer where it stays for an hour and fifty minutes at 289 degrees Fahrenheit. At the end of this time it is ready to be taken out and the whole has been welded together into a single unit. The molds are opened, the tires removed, the cores taken out, and in due season the tire finds its way to the shipping room where, if necessary, the rough spots are polished off.

Another method of tire completion is to vulcanize an already cured tread onto the completed carcass. The advantage claimed for this method is that it prevents the pinching of the tire fabric from pressure by the molds. This does not mean that a molded tire, carefully made, is not dependable; either method will produce a splendid tire by good workmanship.

In the cord tire, an inflated air bag takes the place of the iron core when the tire goes into the vulcanizer. This air bag keeps the shape of the tire perfect and also stretches the fabric about 5 per cent.

But yet the tire is not quite complete. It must have an inner tube. The stock for this was compounded, mixed and sheeted on the calender in a manner similar to that for tires cut in tire lengths, rolled in sheeting and taken to the tube room. Here each piece is rolled on a long steel tube (of the tire size desired) and then

wrapped with cloth. One hundred of these tubes are then placed on a large rack, or frame, and the whole is rolled into the long vulcanizer.

When they come out of the vulcanizer they are dipped in water, the cloth is removed, and the tube is peeled off the steel tube by means of compressed air thus turning the reverse side (smooth side) out. When the rubber was being rolled onto the steel tube, the flap through which the air valve was to be put was cemented on and the bit of transfer paper—giving the name, tire size, etc.—was placed in proper position. When the vulcanized rubber tube is peeled off the steel tube, the message on the transfer paper has been indelibly stamped into the rubber and the bit of paper drops off. The valve is next put in, and the tube goes over to the man who cements the ends together. It is next inflated and hung up on a rack to await the inspector's approval before it is passed as first class, after which it is packed into its own box for shipment.

Of the various ailments which befall tires, volumes have been written; of the possible causes for these—causes which find their root in poor materials or poor workmanship—much more might be said. The cheapest tire on the road is not necessarily the lowest-priced tire but the one which has quality built into it. By knowing of the integrity of the firm behind it, the average consumer can tell what has been built into the tire he contemplates buying.

How About Thirteen?

(Continued from page 39)

It was a greater event as far as real value to the story of civilization and the welfare of this country is concerned than any of its battles. The first word carried on that epoch-making unifier of the new world and the old was sent on the thirteenth of the month.

Particularly in naval matters has this country's luck number certainly been thirteen. The American navy started with thirteen ships and with them startled the world. Thirteen letters are needed to spell the name of its first great sea captain, John Paul Jones. In his most famous engagement it is said that he had only thirteen men able to keep up

the fight when he beat his enemy; the thirteen were enough to do the trick. Later, in the war of 1812, Perry won his famous victory on Lake Erie on the thirteenth of the month; the year was 1813.

On the land the same luck held. It was on the thirteenth of the month that the flag was raised over Fort Sumter. In the most recent great military achievements of the country during the World War, the American leader was John J. Pershing. It takes thirteen letters to spell his name and he arrived in France for the campaigns that meant the winning of the war on June 13, 1917.

Palestine—Old and New

(Continued from page 69)

the British government and the Zionist Organization are already creating the Palestine of tomorrow. The concession granted to the Zionists to harness the River Jordan and the River Aujeh will give the country all the electrical power it needs.

The old adage, "Necessity is the mother of invention" gave to Palestine the very thing it needed, namely, the railroad between Palestine and Egypt. The great problem confronting a general who sought to invade Palestine from Egypt, or Egypt from Palestine, was that of supplying water for his army while marching across the long stretch of sand. The Turk tried to invade Egypt from Palestine, in an effort to expel Great Britain from Egypt, and the result of that memorable campaign is now a matter of history. General Allenby succeeded in invading Palestine from Egypt, not because he was more fortunate, but because he was more careful. There was an old saying among the Moslems that Palestine would be lost to them when the life-giving waters of the River Nile would be made to flow into the desert. General Allenby, whose name in Arabic means, "Prophet of Allah," accomplished the thing the Moslems thought could not be done. He not only built a railroad across the desert, but took the River Nile with him by means of American pipes, and Palestine was lost to the Turks.

This railroad, built primarily for military purposes, is now also used for passengers and merchandise, and Palestine—thus brought into the circle of modern states—is no longer shut off to the world for weeks at a time because of poor harbors during the winter seasons. The tourist from the West can now enjoy the trip by rail and have the comforts of the dining and sleeping cars. The trip takes about twenty-four hours. It took Moses forty years to cover the same distance.

Today most of the important towns are reached by rail. One can go by rail from Egypt to Palestine, and from Palestine to Damascus. Some day Palestine will be on the main line between South Africa and the Persian Gulf. The Holy Land is already well connected with

Europe, Asia and Africa. In addition to this, ships from Europe, Asia, Africa, America and Australia call at the ports of Palestine. As she is only a few hours from the Suez Canal, it means that Palestine is in touch with the whole world.

An auto fan wanted to know if there are any "flivvers" there. Palestine is not well supplied with automobiles but, with a number of fine roads which make motoring a real pleasure, many important towns such as Nazareth, Bethlehem, Hebron and Jericho, not yet connected with the railroad, can very easily be reached by auto. Old roads are being repaired and new roads constructed.

In former days there were no municipal regulations as to building. The city of Jerusalem, and all the other old towns, Haifa, Jaffa, Bethlehem, Nazareth, Tiberias, etc., show the result of it. It gave these towns narrow and zigzag streets, houses facing all points of the compass, without regard to comfort, art, or relationship to other houses and recognized streets. But such anarchy will not be permitted in the future. In Jerusalem several busy thoroughfares, crooked and ugly, have already been widened and beautified, and the prison-like walls removed. The government is also encouraging many public improvements, such as adequate water systems and sewers. The street sweeper and garbage collector are now busy in all cities of Palestine. New colonies and new homes are everywhere being constructed.

In all the changes that are now taking place we cannot afford to overlook the man who is at the head of modern Palestine. In Sir Herbert Samuel, the British High Commissioner, the country has a man, Jewish by race and religion, but absolutely free from all prejudice. He is interested in the reconstruction of Palestine and in making it a real home for the Jew, Moslem and Christian. He is an able and fearless leader, a scholar, a kindhearted gentleman, very democratic, an impartial administrator who commands the respect of all—Moslem, Christian and Jew.

This little country has a past. May it also have a future!

How They Build Plays in a Week

(Continued from page 61)

professional player's magic. We are of a firm opinion, however, that the play is no good and that Monday night, only a short time away, will see a hodgepodge of something. We wonder how the audience will feel when the leading man snaps his fingers at a snag and says "No, no. I don't say that. I say this" and stumbles on with the correct lines. We imagine him doing it and it makes us tremble for him. But he won't, never fear. Just the same, we leave the theater at the end of the third morning with the conviction that it is going to be a terrible performance, crudely done, and we can't see much in the story anyway.

On Saturday we show up again when a day or two has been given to study. Now the thing goes with more snap, more sureness of touch. While there is still floundering around for forgotten lines at times, all in all, things are speeded up and it shows more promise. Still, as we view the two acts given, we can't quite see it as a good play. We have serious doubts as to whether these actors will know their lines on Monday night, so near at hand. We also have a feeling that the audience will throw bricks at the stage in their disappointment.

We show up Monday morning for the final rehearsal. If there is a matinee that day—a terrible thing a Monday matinee—the rehearsal is held early. Some theaters don't give a matinee on the first day of the week, but devote that day to polishing and shoot the show on Monday night.

Anyway we take a seat in the darkened auditorium and wait for the thing to start. The stage is set, perhaps for the third act. The painters, carpenters and electricians have done their work and there before our eyes is a fine scene which a few days before didn't exist. On the stage are director, actors, stage hands, electricians and whatnot. The word is given to start and the director comes down into the auditorium himself.

We're off. With luck we sail right through the act, with a check here and there. Then, with only a brief rest, right through it again, giving needed emphasis, a touch here and there, speeches

checked up for clearness. Probably the director is sitting away back so he can feel how the audience in the rear will get it. Words must get over to the back seats of the theater or many will be disappointed.

Perhaps now, with one act done twice, the actors need a little lunch. So all hands quit for a half hour or so, then return and plunge right into another act, perhaps the second. We find ourselves surprised now at what scenery can do, what rehearsing can accomplish, and also at that magic something that good actors put into their work.

The remaining act is gone over and then the players can go home for a rest to get pepped up for the evening. The thing is in the hands of the gods, now. Everything is done except the speaking of the final line in the play. No theater ever permits the tag line or final speech to be given at a rehearsal. This is an old superstition of the theater. If this line should be spoken, probably the roof would fall in and the building take fire or worse. You can believe it or not, but woe to the actor who ever speaks the last speech of a play at rehearsal. He will get more than a life-size razz.

Monday night! By seven o'clock every actor is in the building ready for business regardless of whether he appears in the first act or not. Are they nervous? Some are, according to temperament. A first night is a bad one for a nervous man. The lights are on outside and we, still the skeptical outsider, pay for a seat and go in. Maybe, if we are sympathetic, we are trembling a little for those in back who soon will be out there on the stage braving that intangible terror, public approval. The orchestra plays its overture and slowly the curtain rises.

What! Well—who the—but sure! We are surprised. The old Irish cobbler mending shoes at the left is just that—an old Irishman mending shoes with a brogue you could cut with a meat axe. With his make-up and costume we failed to recognize him. The last time we saw him a few hours back mending an old shoe and sitting on this same old bench,

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The White Man's Influence in Africa

(Continued from page 47)

countered in his primitive state, private houses are never locked up; school supplies are never stolen and tools are never molested. As a safeguard against black uprising the natives are not permitted to own guns with the exception of the old blunderbuss. Even the missionaries enforce this rule, not through fear but because sentiment so strongly insists.

Where great snakes used to slide through the grass and grinning gorillas used to swing from trees, the most modern railways are now found. Following the prospectors and the mines and the missionaries and the greater farmers, these railroads have been the line of supply for the vanguard.

The English have learned how to run fine trains over their lines. It is not at all strange to see American-type Pullman cars, and American-style engines. Travelers returning are quick to praise the superior sleeping accommodations and compare them with those here in this country. "The compartments are well furnished. There is no extra charge for berth; it is all included in the price of the ticket," says one letter. Another comments on the family size of the compartments, which are made to accommodate two, four and six people. The trains are equipped with every modern convenience. They are not the same as the typical English compartment train but partake more of the American compartment Pullman car.

It seems to be a part of the nature or disposition of railroads the world over to talk about the climate along their routes of travel. It is no exception even in Africa. The phrase, "Hotter'n Africa" doesn't fit except in very few places it is said. The tourist can find any degree of comfort he wishes—from the delightful sea breezes to the cold mountains and the warmer plains.

It is often stated that Washington climate is on the average hotter than that of most places in Africa! "One traveler whose home was for many years in Washington tells of his strawberry patch in Africa and what lovely berries it produced. But along in July and August the nights were quite cool (this was up in the Broken Hill region nearer the

heart of the continent) and to leave the berries out over night might sometimes result in their freezing."

It seems hard indeed to visualize such conditions in a country where the natives are always pictured as going about dressed very briefly to say the least.

The railroads will take you to the most beautiful lakes and rivers. Right near the tracks are to be found some of the most gorgeous giant ponds of water lilies, as well as swarms of tsetse flies. The lions at night "sing in the brush" and so the most modern and the wild meet. (In Africa a lion is said to "sing" when it roars.)

It is a rapidly developing part of the world, is Africa. Its problems have almost ceased to be preeminently the conquest of the wild, but have become problems of how to live peacefully with neighbors of varying color and education and intelligence. The missionaries have about touched the utmost section and have formed a sort of gentlemen's agreement not to overlap in their work for the natives.

Having grown up into the family of civilized sections of the globe, Africa is seeking to eradicate the dangerous flies that are sometimes infected and cause trouble and to push still farther back the disturbing reptiles and wild animals that prey.

This is going on apace with such weapons as motor cars and swift travel. Large agricultural estates with their great mansions fitted with American plumbing and electrical conveniences are giving the natives profitable work to do and better food. Stock breeders are utilizing the hardy native cows and producing an animal that will give more milk. Machinery is everywhere.

This survey covers the general industrial and economic conditions found throughout Africa along and below the Equator. Travel is fairly easy through East Africa, much of the Belgian Kongo, Northern Rhodesia, Southern Rhodesia and, of course, in the Union of South Africa where the greater industrial concentration lies. It is here that the natives flock to gain the "easy money" that the white man will give to keep from work.

A Great Forest Gone to Sleep

(Continued from page 32)

subsidence of the Jurassic Period, this prone mesozoic forest sank to where the vast later sediments of the cretaceous era could wash down upon it, mile-deep," the scientific man tells us. "In these deep bowels of the earth, the springs of sulphur, iron, copper, salt; the paste of chalcedony, the solutions of silica still rumbled; and the pressure that would break the ribs of a dreadnought as an elephant might efface a gnat, injected these mineral waters into every fiber of the one-time wood. Of course, it went slowly—the pressure increasing only as the trunk hardened to resist. Else we should have nine-foot trees 'pressed' in the geologic book as flat as we press a flower in the family Bible. The mineralization must have been contemporaneous with the first coverlet of sediment—or ahead of it. No mere wooden tree could have withstood the impact of two miles of perpendicular stone to the square inch."

And then what we are pleased in this day to call the Tertiary Age—and the vast emergency of sunken water-logged continents to God's forgotten sunlight—by an upheaval so judicious and so balanced that it did not ruffle the sedimentary blankets, the sheets nor other bedclothes of a sleeping world. And the forgotten forest came up to the top of the continent again, then cuddled under a mile or so of cretaceous counterpanes. Even now it is a mile above the sea.

And then the erosions and corrosions of the aeons, the moths of geology, began to eat the bedclothes; and blanket traveled away by grains of sand to fill the womb of the far Pacific with the embryo of continents yet unguessed. Strata by the thousand feet were devoured away by that slow, implacable tooth. And in the fullness of the ages the immortal forest came back to the sunlight where once its myriad leaves danced and breathed a mortal air—the same fierce Arizona sun under which it dazzles our eyes today.

Occasional ruins of prehistoric Indian settlements are encountered in the petrified ruins region. Some comprise a solitary habitation only. Others show that several families were housed together. A

few indicate the presence of villages numbering many inhabitants. About a mile from the petrified bridge may be seen the crumbling ruins of a small pueblo, with its plaza surrounded by houses averaging ten feet square and a tiny graveyard. The walls fell long ago, but it is easy to determine their position.

In the North Forest, on the edge of the Painted Desert, are the ruins of a dwelling built of fragments of petrified wood; a similar deserted edifice is found in the Third Forest, eighteen miles away. The largest of these homes of the ancients is called the Aztec Ruins and Hieroglyphics. It lies two and a half miles east of Adamana, and here are walls of broken stone and mortar about a foot high, which mark numerous dwellings fronting a plaza 130 feet wide by 210 feet long. Near the plaza's center is a small kiva, similar to those in use by the Pueblo Indians of this day. The flagstone pavement of this old kiva is in a good state of preservation.

These three forest are a National Monument, created by executive act and are under the control of the Department of the Interior. Within the boundaries of this monument are found the most important deposits—wonderful mosaics that have flashed back to the skies since long before man began to infest the planet and boggle over its geologies—which are thereby protected from spoliation and kept intact for your enjoyment and mine whenever we choose to take advantage of the opportunity of traveling to see them.

When Your Automobile Bolts Will Not Shake Loose

THE development of motor-car engines and other machines having much vibration has concentrated attention upon devices for locking nuts upon bolts. In a recent discussion of this subject attention was called to the fact that, for ordinary motor-car work, a well-fitted nut tightened upon a well-fitted thread will not slip under vibration if the number of threads is more than twelve to the inch. Such bolts and nuts should be secured with spring-lock washers. They are then safe up to a bolt diameter of an inch.

Guarding the Country's Crop Reports

(Continued from Page 81)

five thousand voluntary field aids throughout the country who report, respectively, to their state statisticians. The state statistician in each case works up average figures from his personal information and that supplied by his aids and sends the average figures to Washington. The county reporters send in their reports to the National Capital where they are averaged with the state as the unit. Additional volunteer reporters in all of the thirty-five thousand townships in the country also send in their estimates which are averaged at the Washington headquarters of the Bureau of Crop Estimates. Uncle Sam arrives at his final report by averaging the figures of these three sets of reports and interpreting them according to the agricultural prominence of the state where the record was made.

When the Board of Crop Estimates meets on crop reporting day at Washington, none of the members knows anything authentic about the figures with which they are to wrestle. Accompanied by a large corps of clerks and mimeograph operators, the agricultural statisticians retire to their secret chamber. The doors are then locked and the big job of interpreting the figures begins. It is only a few minutes before the final report is released to the waiting newspaper representatives that the agricultural experts are able to visualize accurately how the different sets of estimates dovetail together and typify our status of agricultural prosperity or depression, as the case may be. Under the existent systematic method of handling this secret information, there is practically no opportunity for any of the data to leak out before the time of its official release.

The Government crop reports are estimates by counties, states and the United States of acreages planted to different crops, number and condition of the different classes of live stock, progress of farm work, condition of growing crops as a percentage of normal, forecasts of yields per acre and total prospective production during the growing season, yields per acre and total production at or near harvest time, percentage of crops shipped out of counties where

grown, percentage of crops remaining on farms or in country mills and elevators, prices received by farmers for their products, value of farm crops and live stock, value of farm lands and miscellaneous factors of farm production. In other words, the Government crop reports are designed to show the essential facts of present and prospective crop and live-stock production and supply. The only data given out to the press representatives on crop reporting day are estimates relating to the corn, cotton, wheat and grain crops. The rest of the information is published in the Monthly Crop Reporter which has a circulation of one hundred and fifty thousand copies and keeps the entire country informed of agricultural activities.

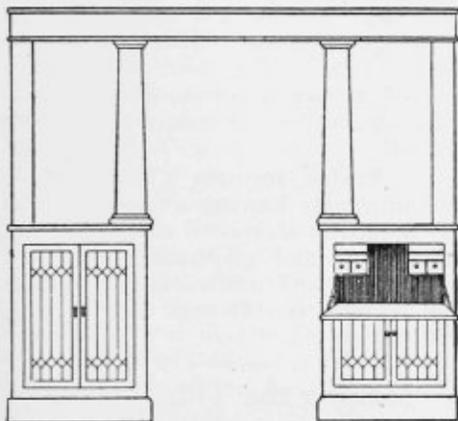
The Bureau of Crop Estimates, the oldest agency of the Federal Government for collecting and publishing information relating to American agriculture, is the reorganized Bureau of Statistics of the federal Department of Agriculture and the official statistical clearing house of agriculture as an industry. Today, our agricultural business represents an investment of more than eighty billion dollars; our internal and domestic life is largely dependent on the successful tilling of the soil, the harvesting and marketing of its produce. It is fundamentally a good business policy for Uncle Sam to keep close tab on his mammoth farming industry. The Bureau of Crop Estimates is his dependable right bower in the consumption of such activities. It is the best organized and most efficient countrywide reporting service ever established in any country. No matter what agricultural survey Uncle Sam wishes to make, no matter what kind of questionnaires he wishes to circulate, he always has a reliable organization to do the work. He can send five or ten copies to each of his two hundred and fifty thousand field correspondents and ask that these questionnaires be given to the leading farmers of their sections. In this way, without extra effort or expense, he can gain detailed and average reports from all sections of the country, data which otherwise could be secured only after a great deal of expense.

Utilizing Pillar Bases

THE high bases which are built under the columns of large cased openings between rooms are usually finished off in ordinary wooden panels. In such cases, except for the decorative and supporting features, the space is wasted. It can be more fully utilized. The low types of bases can be remodeled and the

appearance similar to that of the bookcase on the opposite side. The lower space of the writing desk should be fitted with doors to match. The space behind these doors can be used for storing letter files, account books of the home, spare writing materials and also the various things that seem to collect in any home writing desk. By this means, the desk itself will always be clear and uncluttered, ready for immediate service.

By using this arrangement, a saving of space will result by the bases vacating the spaces usually occupied by these two pieces of furniture. Persons contemplating building a new home will find the consideration of this arrangement of pillar bases an interesting detail.



This Arrangement Makes a Convenient and Space-Saving Addition to Your Home

space used also as bookcases. When the bases of the pillars are built large and high, then the space can be usefully brought into added service by building a bookcase on one side and a writing desk on the other.

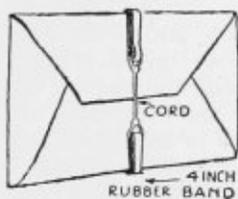
When the bases are to be remodeled, remove the panels from the side that you wish the doors to be on. The interior of the base should then be firmly braced with two by fours in such a manner that clear space is left for the bookshelves and the writing desk to occupy. After the backing of the two cases has been installed, the shelves should be fitted. Then the doors—preferably set with ornamental, leaded glass—should be obtained and hinged in place. It is not imperative that leaded glass be used, but it is desirable because it presents a very pleasing appearance. The desk should be provided with a generous number of pigeonholes and the hinged, wooden panel that lowers and raises to open and close the desk should be matched on the outer side so that it presents an

Cover Your Radiators

Radiators in the home or school or other public building where looks count for much may be made to harmonize with the wall decorations by covering the top and a few inches down the sides with a crinkly crepe paper piece folded to fit. The paper not only takes away the ugliness of the coils of metal, but it protects the walls above from the greasy dirt that accumulates upon it from the rising heat with which dust mingles. When radiators are placed under windows, these covers are especially desirable in that they protect the curtains. They may be renewed at little expense and trouble.

Elastic Cord for Portfolio

The sketch shows how to improvise an elastic fastener for an envelope or portfolio which is much easier than tying a string about it.



It is better than tying and untying the ordinary string. Two 4-inch, flat, rubber bands connected as shown with two pieces of heavy cord, allowing sufficient tension, is all that is required. This will serve as one band and will be found to be very convenient.

Where Hunting is a Part of Religion

(Continued from page 57)

down to the lowly prey mole. Going to the enchanted corral in a great crowd the children of men and the prey animals were able, through the magic of a great Medicine Man, to release the game animals one at a time.

The first to escape was the deer, who came forth and ran northward so that he was allotted to the mountain lion, who killed him at once. The coyote was told to watch the west, for the mountain sheep escaping that way should be his; but when the sheep came out it got away and the poor coyote never did catch it, having to content himself with the remains of the kill of the lion and of others—as he actually does to this day. The wild cat of the south was given the antelope and the wolf of the east the albino antelope, a species now practically extinct. The jack rabbit was released for the eagle, the cottontail for the hawk, mice for the prey mole, and so on. Finally all were released and badly scattered, so that elk and bison and many other animals are to be found in the various sections and some of those assigned to the north or west are also to be found in the south, accounting, of course, for the distribution of game.

Thus it is that the deer hunter carries a mountain lion fetich and the rabbit hunter a symbol of the eagle. In spite of the fact that the poor coyote did not catch his game, his fetich is supposed to be powerful—next to that of the mountain lion, which, being master of them all, is good for any kind of hunting.

The magic of the image is, however, but one phase of the religion of hunting. Ceremonial dances and rituals occur during every moon in connection with tribal hunting in most Pueblos, and in midwinter there is usually a great "community" ceremony and hunt. The variety of these dances is great, some of them being to propitiate the gods of the prey animals as in the mountain lion dance, while some are in reality remarkable dramatizations of the hunt itself.

Such a one is the buffalo dance, now out of practical use but still danced by some Pueblos, notably the Tesuques near Santa Fe. In it half the dancers represent hunters and the other half, prac-

tically naked and painted black, with huge replicas of buffalo heads (usually real horns and hide) fastened to their own, play the part of the hunted buffalo. The ceremony is a thundering, dramatic one, carrying the spectator vividly through all the thrilling phases of the hunt.

Tesuque and Taos are both famous for their deer dances, less spectacular but more graceful and intricate than the buffalo dance. The deer dance is considered a sacred ceremony as well as quite essential to success in the hunting season.

The Pueblo, formally a good Catholic and invariably bearing a Spanish name, has nevertheless retained much of his old pagan life and civilization—all of it picturesque and much of it beautiful. His hunting is still part and parcel of his religion.

Making the Tidal Power Go to Work

IT is reported that a Danish engineer plans to erect works in Schleswig-Holstein by which he can make the tides in the North Sea generate electric power.

He intends to bulid between Husum on the mainland and the island of Nordstrand a succession of dams that will form two immense reservoirs at different levels. The higher one will have an area of fifteen hundred acres, and the lower one an area half as large again. When the tide is rising, the level of the sea will be from two and one-half feet to ten feet higher than that in the lower reservoirs; and it is estimated that the flow of water through turbines from the sea into the reservoir will produce five thousand horsepower. As the tide nears the flood, the sluices of the higher reservoir will be opened, and the water will flow into that until the ebb begins. For six hours, while the tide is falling, the gates between the higher basin and the sea will be open, and the flow of water through them will drive the turbines. The sluiceways will be arranged so that the turbines will always be driven in the same direction. The plant is expected to supply power constantly over a large territory.

Fastening Handles on Umbrellas

Wetter weather will soon set in and umbrellas will receive rough service in the heavy breezes that blow. In the course of usage, it frequently happens that an umbrella having an expensive handle will get broken, and the owner, naturally, desires to have his favorite handle put on another one—sometimes a cheaper article. By following the simple instructions outlined, any person can put a different handle on an umbrella.

Clean out hole in handle, making it slightly wider than the diameter of the rod to be inserted. Then wrap a few layers of cloth on the handle, to protect it from injury, and clamp it in a vise using just sufficient force in the vise to hold it upright. Next fill the hole in handle with powdered sulphur, heat the steel end of the umbrella rod red-hot and quickly push it down into the sulphur, holding the rod as straight as possible.

The heat will fuse the sulphur and cause it to grip the rod tightly when cold. Umbrellas that are turned upside down to dry often have the glue loosen around the handle, allowing the latter to work loose. The sulphur makes a strong waterproof joint. If desired, notches can be filed in the steel rod where the sulphur grips it to make a firmer joint. This method can also be used to fasten rods of iron or steel into stone, iron or wood. It will be found far superior to the ordinary methods used by manufacturers and will make a very firm joint. A damp rag should be wrapped around rod to prevent the varnish from running.

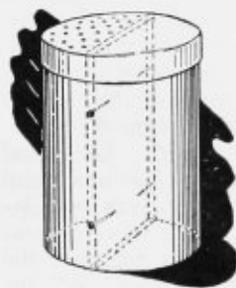
Serving Three Purposes with One Hose

The wires on electric toasters, irons, etc., are handled quite often with the result that they become tangled and kinked up. A small rubber hose slipped over the wires, as shown, will end such trouble and at the same time prevent wear and protect the user from unexpected shocks. Draw cord through hose with a piece of stiff wire.



A Salt-and-Pepper Shaker

A handy salt-and-pepper shaker which will be just the thing to take along on camping trips or even to be used in the kitchen can be made from a tin can and a piece of cigar-box wood. The wood should be scraped so as to remove all odor of cigars or else a thin board of



similar nature should be used as a partition across the center of the can. The partition should be fastened with four light nails driven through the outer tin sides and then opposite sides of the can marked or painted so that the

contents of the halves may be readily known. The cover, perforated on half its upper face, can be turned so that salt alone or pepper alone will fall out. It can also be so adjusted as to shake a little pepper out with the salt in the proportion desired.

Glass Cutting Without a Diamond

The corner of a sharp file will scratch glass sufficiently to make it break evenly, but the bed the glass is laid on must be quite level, as considerable pressure has to be applied. Take care that there are no gaps in the scratch. Run the file lengthwise along the glass so that a number of teeth engage it.

About half an inch or a succession of half inches can be cut from the edge of a sheet of glass with an ordinary pair of scissors if both they and the glass are kept well under water.

To cut a piece of tube or the neck or body of a bottle, dip a thread of wool or cotton in turpentine, hold the glass horizontal so that the thread is vertical, set light to it, dip the glass in cold water and it will part where the thread lay.

These means of cutting glass will be found to be very convenient when there is no regular glass cutting tool at hand. This is often the case when one needs it.

None of these methods are advised where a large sheet of glass has to be cut, but there are times when they will be found useful.

In the Clutches of the Werewolf

(Continued from page 92)

steadily and the Dawes contract will be fulfilled unless Heath is put where he cannot block our plans. I'm coming up to see you personally and—

This far Heath had read when the door was flung open and Bradley came in, stamping his feet to rid them of the snow. Then he caught sight of Heath, sitting at his desk, the letter still in his hand. He must have recognized it instantly, for into his eyes came a dangerous glint. Without speaking, he reached behind him and closed the door.

"Snoopin', eh?" he said. The usual bluster was missing from his tones and he spoke quietly. Heath was not deceived. He knew that he was in great danger, that the foreman was not the kind to accept the discovery of his treachery and double-dealing meekly. No doubt Bradley expected to reap great profits by selling out his employer. He would not let them trickle through his fingers without an effort to prevent it. How far would he go? Through Heath's mind flashed what old man Lightner had said about Bradley. He was a bad man, always had been, and the torturing to death of an Indian whose only offense had been defeating him in a fight was quite to be expected of him.

Even as he came to his feet Heath looked quickly around for a weapon which would give him some chance if it came to a personal encounter. Finding none at hand, he faced the other boldly. "I did not snoop, as you call it, intentionally," he said. "However, I am glad that it happened, glad that now I have you out in the open where I know on which side you stand. Let me pass!"

Bradley's arm shot out, vise-like fingers seized the front of Heath's coat and he was jammed back until the log wall barred further progress. As easily as if he had been a child the foreman held him there. Bradley's face was contorted with rage, his lips curled back from his teeth in a snarl. Even in that instant Heath was conscious of the resemblance to the bared fangs of Satan, the wolf-dog.

"You think you're glad, do you?" grated the foreman. "Before I get through with you you're going to be

damned sorry. I been achin' to get that slim neck o' yours between my fingers, but I laid off because I thought you was too big a fool to discover anything even if you stayed here all winter. You wander in here and find out somethin'. Well, it's goin' to cost you a lot."

His other hand went back, fumbled for an instant under his mackinaw and came forth again, holding a revolver. With a flip of his hand he reversed it, his fingers closing about the long barrel. Then his arm described an arc through the air with tremendous force and the butt of the weapon descended upon Heath's head with crushing impact.

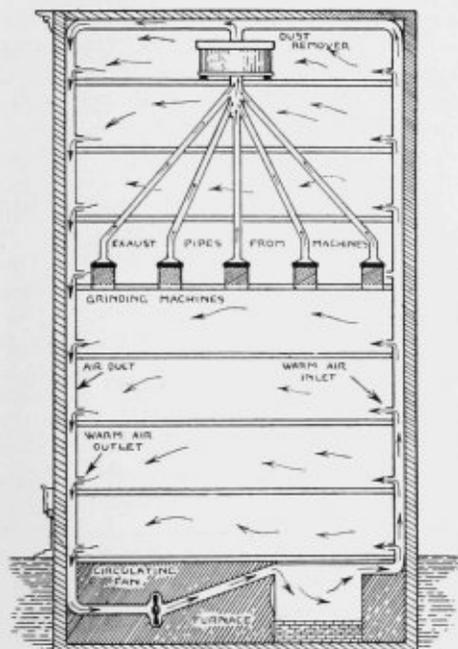
Heath came back to consciousness to find that his head was paining him greatly and when he opened his eyes discovered that he could not see clearly. Things were still very much in the dark and he closed his eyes for a few moments before opening them again. When he did so, the darkness was still there and he knew that it was the darkness of night. Under him he felt rough boards and as his eyes became accustomed to the dim light he discovered that he lay on the floor of a cabin of some kind. He was thoroughly chilled, too, and with a view of moving around and stirring up his circulation he struggled weakly up to a sitting posture, then to his feet. There he swayed a moment uncertainly, then staggered across the floor to where he discerned the vague outlines of a door. But he could not open it, although he tugged and pulled and shook it. As he had feared, he was a prisoner!

It was quite plain that Bradley had carried out the instructions conveyed in that letter. He had put Heath "where he cannot block our plans." From whom had that letter come? If it was signed Heath did not know. Bradley had come in before he had finished reading it. What the plans were he thought he knew. First, to cause him to forfeit on the Dawes contract, thus compelling him to dispose of his formula. And who would profit most by that? Remembering his encounter the previous day with Jasper Willmot, Heath thought he knew the answer to that question, too.

(Continued on page 142)

Heating an 8-Story Building by Friction

A heating system which will use heat generated by friction in the flour grinding process is being installed in a new mill now under construction in Kansas City, Missouri. The new heating system was developed during experiments in



A Kansas City Firm Utilized the Heat From Grinding of Flour to Warm the Entire Mill Building

using exhaust heat to regulate the humidity of the air in the new mill.

Engineers estimate that enough heat is generated in the milling processes to steam a boiler of 150 horsepower and that the new system will result in a saving of at least three hundred tons of coal a year. It is said to be the first time that heating a large building by friction has ever been attempted.

The accompanying diagram illustrates the principle by which the new heating plant will succeed. Heat generated by the grinding process in the milling machinery is discharged from the exhaust pipes into a dust remover on the top floor of the 8-story building. A large fan in the basement then draws the heat through an air shaft to the basement and forces it up another air-shaft circuit from the basement to the top floor.

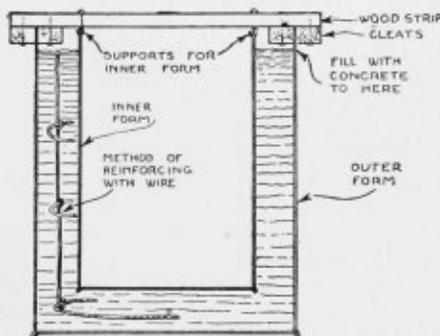
The hot-air circuit established, the rest of the heating plan operates in a manner practically the same as the hot-air furnace heating system. The hot air moving up in the circuit is discharged from the air shaft into any of the floors through a hot-air opening. Another opening on each floor allows the air to empty back into an air shaft on the opposite side of the circuit.

When the milling machinery is not in operation, the building will be heated by furnaces which are installed in the basement as a part of the new system. The plan will operate in the same manner when the furnaces are in use, the air being pumped over the heated furnace and into the same air-shaft circuit.

Concrete Pots Made by Using Cans for Forms

Concrete flower pots are durable, attractive and inexpensive if made as shown by using two ordinary tin cans for forms. Use only bright or smooth-surfaced cans and allow cement to dry thoroughly before removing the forms. Mix the concrete by using one part cement and three parts sand, clean gravel or finely crushed rock. Tamp concrete in firmly to prevent voids or holes.

The shapes of the finished pots may be varied to suit the individual maker by



Ornamental Flower Pots of Cement Are Easily Made from Inexpensive Material

using personally selected, differently shaped cans for forms. In this way, pots may be made to suit the space in which they are to be located.

If desired, the finished pots can be given two coats of bright green paint. This will add further to their attractiveness and decorative appearance.

In the Clutches of the Werewolf

(Continued from page 140)

His thoughts did not dwell long upon those things, however. His immediate predicament was of far greater moment. There seemed little doubt that after knocking him senseless Bradley had carried him to this cabin, wherever it was, and locked him in. It was a single room affair of logs and with no opening except the door. As his eyes became accustomed to the gloom, he could see that it had not been occupied recently. There was not even a bunk or a stove in it, only a rude table and a chair made of slabs.

What did Bradley intend to do with him? Leave him there until cold and hunger claimed him? Well, he didn't intend to accept such a fate supinely. With a leg wrenched from the chair he attacked the door but desisted when he discovered that he was making no impression upon it, but only bruising his hands when his club recoiled from the heavy slabs. He tried to use the leg as a pry, but the end was too thick and blunt. With an idea of sharpening it he felt in his pockets for his pocketknife. He had been stripped of everything.

Then he heard the crunch of footsteps upon the snow outside, a fumbling at what seemed a chain on the other side of the door. Quickly he stepped to one side and raised the chair leg. If it was Bradley he would fell him as he stepped inside.

Soon the door was kicked open and into the cabin bounded Satan, the wolf-dog. He spotted Heath instantly, skidded to a stop upon his haunches, turned to face the man and growled savagely.

The next instant Bradley had leaped swiftly through the doorway, the ray of a flashlight shone out and at once sought Heath's face and remained there, blinding him with its brilliance.

"You can drop the club," said Bradley. "I got you covered. One crooked move and I shoot you down."

"That's better," he went on as Heath let his arm with the chair leg drop to his side. "Now we can talk comfortable. First time we met you called me a coward and on the train you said I was a brute. Today when you found that letter—"

"Cut it," said Heath. "What's the use of wasting time? If you're going to kill me, do it now and leave off the talk."

Bradley's loud "ho, ho, ho" rang out. "I'm not goin' to kill you," he said, "but you're goin' to die just the same. Soon's you hear what I got to say I'm goin' to set Satan on you and he's goin' to rip out your throat. When they find your body folks'll say 'twas the werewolf as done it. Mebbe they won't be so far wrong, at that."

Chapter VIII

Satan, seeing that his master had taken charge, had been sniffing about the cabin. Now he stood in the doorway, clearly outlined against the snow outside. His head was poised in a listening attitude and there was a rumbling deep in his throat.

"What ails the fool dog?" growled Bradley and profanely called upon the beast to come back. The lumberjack had turned his head slightly to watch the dog and the ray from the flashlight had wavered from Heath's face. It was the opportunity for which he had been watching. He raised the chair leg, hurled it with all his might at Bradley and sped through the door. Heath heard the grunt of the foreman as the heavy piece of wood struck him, then bellowed curses and over his head the whine of a bullet as he raced through the trees.

He was conscious as he fled that to one side a struggle of some kind was going on and that one of the combatants was the wolf-dog. Then he heard an agonized yelping that bespoke some dire pain, the crack of the foreman's revolver again, followed immediately by a scream.

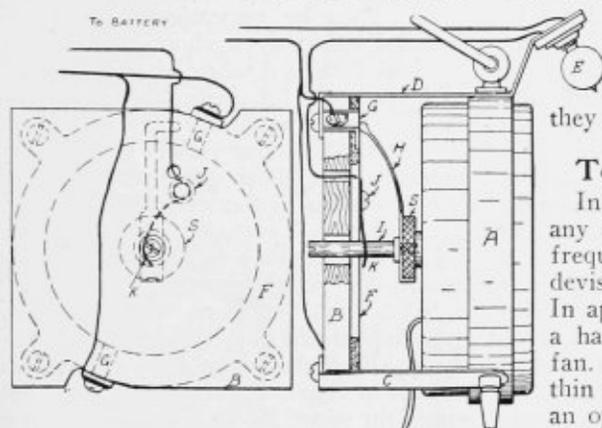
Heath kept on running without any sense of direction or any idea of where he was going. His only thought was to put as much distance between himself and whatever was going on back there as possible. Thus it was that he found himself suddenly in a clearing and discerned the outlines of buildings. The door of one was thrown open and three men came out.

"Who's this?" demanded one of them, catching sight of him, and recognizing

(Continued on page 144)

Light For Alarm Clock

The accompanying sketch shows an alarm clock fitted up to give an intermittent light for a period of about one minute every half hour. The small board *B* is set up and held about $1\frac{1}{4}$ inches away from the back of the clock by means of two lower supports *C* and one



Wiring Diagram and Mechanical Details of the Night Light

upper piece *D*, the latter extending out and up at the front to carry the lamp *E*. Fastened to the inner face of the board is the fiber ring *F*, into which is inserted the terminal *G*, to which one end of the light wire is connected.

The hand setting button is replaced by one of vulcanized rubber to insulate the current from the clock mechanism. The light spring piece *H* is held to the button *S* by means of the long screw *I* that forms the other terminal. The loose end, *K*, of the wire bears against this pin and the circuit is closed when the end of the piece *H* is on one of the inserted pieces *G*. The inner end of piece *H* is bent and fitted in a small groove in *S* to keep it in a definite position. As *H* is fixed to *S* it moves simultaneously with the hour hand. The light may be made to glow as often in the hour as desired by additional terminals placed in the ring *F*.

To Tell the Age of Eggs

Eggs decrease in density as they grow older. Their age may be ascertained by their specific gravity.

Melt 2 ounces of kitchen salt in a pint of water and place the raw eggs in it. When first laid they will descend to the

bottom; when one day old they will almost touch it; when three days old they will swim and when older will float on the top. The more they project above the water the older they are. A candled egg will float lower than one untreated as it is coated so as to make it air-tight, thus preventing change in the contents.

Its cracking in hot water is not due to badness, but to the same cause—the shell being air-tight prevents the escape of gases as they expand with the heat.

To Trim Ornamental Trees

In the trimming of a shade tree to any desired shape of crown, use is frequently made of a dendroscope, devised by the Frenchman des Cars. In appearance, this device resembles a hand mirror or a stiff cardboard fan. It may be made of cardboard or thin wooden board. Into this is cut an opening which shows, in outline, the shape to which it is desired the crown of the tree be fashioned.

The dendroscope is used by an observer who stands on the ground at a distance away about equal to the height of the tree. The observer holds the dendroscope in an upright position so that when he looks through the opening the lower edge coincides with the lower outline of the tree's foliage, and the top



Trees Can Be Trimmed to the Desired Shape By Use of This Idea

with the place in the crown at which it is desired to trim the new shape. From this position the observer directs the cutting of the limbs and branches till the outlines fit the outline of the dendroscope opening. By gradually moving around the tree, the perfect shape is thus obtained. This is a very simple and effective method for country home use.

In the Clutches of the Werewolf

(Continued from page 142)

the voice he cried out, "Nelson, Nelson! It's me, John Heath."

"Thank God," he heard, then felt himself taken by the arm and led through the open doorway into a cabin which he at once recognized as that of Bradley.

Inside he recognized the lumberjack's companions. One was old man Lightner, the other Jasper Willmot.

"I suppose, Willmot," he grated, "that you thought I was done for and came here to gloat over your success—"

"Hold on, Heath." It was Lightner who interrupted him. "You're wrong, man, dead wrong. Willmot is your friend, not your enemy. I, too, thought otherwise and I sent Nelson up here to keep an eye on you and post me on what was going on. It was I who tied up all the flat cars on the logging railroad in the belief that I was beating Willmot to it if he was trying to crush you. I was going to make sure that you had all the flats you needed to get your logs to the mill."

"I'll not try to thank you now," said Heath. "You say Willmot is my friend—"

"Yes. He and I thrashed that all out today after Nelson came to my camp near here and reported that you had disappeared and that there was blood on Bradley's cabin floor."

"Then, who," broke in Heath, "is my enemy?"

"I'll answer that," spoke up Willmot. "Peter Dawson."

"Peter Dawson," echoed Heath, "Why he—"

"Is your right hand man and has posed as your friend," the millionaire went on. "I'm afraid, Heath, you've been nourishing a viper in your bosom. Just before I came up here Peter Dawson came to me and said that he expected to be able to offer me your preservative formula in a short time, that you could not possibly fulfill the Dawes contract. He evaded my questions and I became suspicious of him, especially when I learned that 'Buck' Bradley was your foreman. I knew both men and I knew there was not much either would stop at to accomplish their ends. I came up here to investigate for myself before I gave you

a warning. As I told you the other day, I was wrong about that formula and I felt that perhaps we could get together, combine business and work together instead of against each other."

"This is all so unexpected," Heath began. Then he remembered what had befallen him only a short time before. "I think," he said when he had sketched his experience for them, "that if we can find the place again we may go a long way toward solving what is the only mystery left about this whole affair. Who, or what, is the werewolf?"

"Daylight's come," said Nelson. "What's easier than to find the cabin by backtrailin' your footsteps? Come on."

So the four of them, with the keen-eyed lumberjack in the lead, did that very thing. First they came upon the lifeless carcass of Satan, the wolf-dog, stretched out in the snow, his back broken by some mighty force.

A few steps farther "Buck" Bradley lay face up, his eyeballs distended, his tongue protruding and about his throat the marks of powerful fingers that had choked out his life.

From the side of the dead man led a bloody trail. Following it into the brush, they came across a third body. It was garbed in furs crudely fashioned into a garment, but the legs which extended beyond it and the outthrown arms with the long fingers and the uncut fingernails were unmistakably human.

They turned it over and Nelson stooped down to brush from the face the heavy mop of hair and reveal the hideous countenance of the werewolf. Even without the tell-tale marks about the neck and ankles where in some bygone day a rope had twisted and burned, both Lightner and Heath would have known the werewolf for what it was—the Indian whom "Buck" Bradley had tortured as the Indian of Mexico tortures the enemy who falls into his hands.

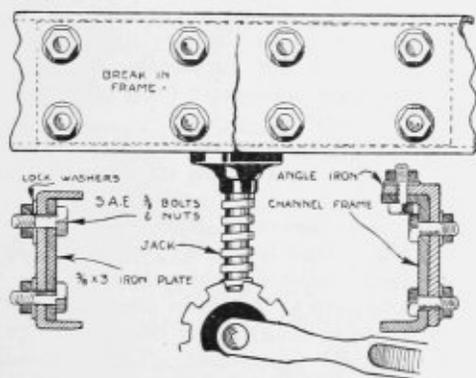
When "Buck" Bradley, boasting on the train, had said that "Injuns don't count" he had erred in one particular. "Injuns" do count when they are not dead, as one thinks, but live to stalk and in the end kill the one upon whom they seek vengeance.

The End

Repairing Broken Automobile Frames Quickly

Sometimes a driver is halted on a long trip by the breaking of the frame of his machine and the delay proves costly and embarrassing. It need not be so if he knows an easy way to repair a broken frame.

There are two ways in which it can be done, either of which is good and will make a permanent repair. One way is to take a piece of flat iron of suitable size



Automobile Frame Can Be Repaired on the Road By This Method

and thickness and fasten it to the inside of the frame, as shown in the illustration, with standard bolts and nuts, using lock washers under all the nuts.

Bolts and nuts are superior for this purpose in a road repair case, for rivets cannot well be fastened except with ideal tools and equipment. The inlayed iron plate should fit snugly into the inner side of the channel frame and all corners should be rounded off to make as tight a fit as possible before drawing up the bolts.

Angle-iron may also be used for the patch. It is especially recommended for heavy cars, as the lower flange of the angle-iron braces well against side strains.

A broken frame can readily be repaired in a few hours in this way with the aid of a good drill and a few ordinary tools. The work is not difficult and can be done by any owner.

Longer Life for Auto Tires

Auto tires which have become cracked or where the rubber is hard and brittle

can be made serviceable again for months by the following method:

Inflate the tires to the pressure of an ordinary rubber ball. Immerse them for half an hour in an alkaline solution composed of one part of ammonia to two parts of water.

On taking them out, store in a dark place for forty-eight hours and the rubber will be restored to a soft, pliable state.

In effect, the solution neutralizes the acids in the rubber. By drying them in a dark place the air is kept free of destructive acids so that the process of vulcanization that goes on in the tube is retarded.

A Garage Without Windows

An efficient private garage is the goal of every motorist, but there is one recently built by a New York man that has combined both utility and attractiveness to a remarkable degree.

Although this garage has no windows, a type of construction that makes it more difficult for the thief to break into, the two large skylights on either side of the roof furnish an abundance of light even when the doors are closed. Coming from angles far above the machine, this ingenious method of indirect daylight puts the illumination just where it is most effective when working on any part of the mechanism. The modern automobile usually gives little trouble in starting, but the two tiny cozy seats at either side of the door are put there for a purpose. If the motor doesn't begin to "mote" at the appointed time, mother and the kiddies can remain outside and listen to the birds instead of the wheezy coughs of a sick motor.

The inside equipment of this unique garage includes a large work bench, a cabinet and several drawers built especially for the many odds and ends so often scattered about such buildings. Just above the hood of the car is a heavy beam from which block and tackle may be suspended and the motor lifted out of the frame to a place on the bench where it may be overhauled to better advantage. Anybody who lives in a small town or the suburbs of a large city will find this type of garage most efficient.

Shall We Really Fly Without Motors?

(Continued from page 53)

ideal glider among the navigators of the air. As will be seen, the front edge of the wing is fairly thick. In the top figure we see the peculiar manner in which the air meeting the wings near the center is caused to flow toward the body while near the tips it flows away from the body. The modification of the air currents becomes even more perceptible on reference to the middle figure, which pictures the lower or sustaining surface of the wings and the varying positions of the flaps at different points.

Of great interest in connection with an attempt to understand the theory of bird flight, which underlies the principle of the glider's flight, is the manner in which the air swirls, whirlpools or spirals are created. As already stated, it is necessary to thicken the front edge of the glider's wings so as to produce a correct cleaving of the air in front of it. The air is then converted into a current leaving the wings in a direction opposite to that in which it met them. But in addition, the air is turned in a direction at right angles to the wings and finally leaves the wings lengthwise with the wing tips.

The result is that the whirlpools at the center of the wing produce considerable forward motion for the simple reason that the thickened or downward curved wing front opposes considerable resistance to the reversed current of air. Another factor which the Lilienthals proved quite early in their experiments, shown with particular clearness in the lower figure on page 52, is this: The horizontal air current meeting the wing front straight on is deflected downward—not upon actual contact with the wing but several feet in front of it. The current then forms an oval whirlpool with two distinct centers and this whirlpool is drawn out, in the shape of spirals, toward the wing tips. In this manner it becomes possible for a given air current to carry the sailplane and to give it forward motion at the same time.

The argument that sailplaning is the imitation of bird soaring might easily lead to the question how it happens that

not all the birds are good gliders or soarers. We know, for instance, that the stork, the condor, the eagle, the gull and the swallow are excellent soarers, whereas the chicken, the pigeon, the parrot and other small birds fly only with considerable muscular effort expended in the form of wing-flapping. The answer is that the wing profile of the first group of birds has the peculiar shape needed for the production of the whirlpools of air under them, whereas the latter group of birds has wings that are too thin for soaring. All the successful gliders—without exception—have been built with thickened wings.

Now that we have a fair understanding of what causes the sailplane to remain in the air without the help of anything but the air itself, the query naturally suggests itself: What is all this about—what does it mean?

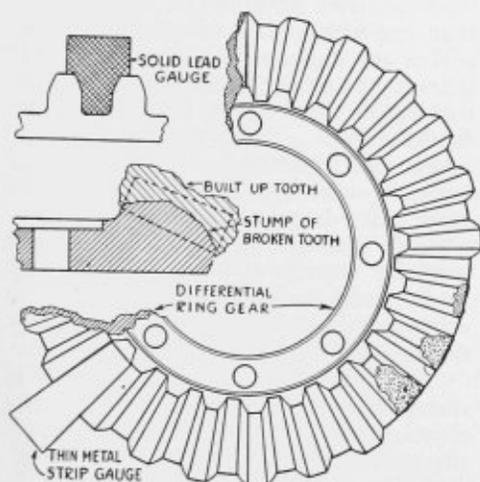
Before setting down an answer it behooves us to realize that this is no age for skeptical prophecies. Under sober contemplation it seems that sailplaning bears to motor-propelled flight about the relation that sailboating bears to motorboating. Just as the work of the sailboat designer is of great influence on the tasks of the motor-boat builder, in suggesting new lines and new ways of overcoming the handicaps interposed by water, so the continued development of the sailplane will bring to the fore and call renewed attention to the finer points of flying which the improvements achieved in motors may have temporarily obscured. Already there are very small planes, really gliders in design and construction, equipped with nine or ten horsepower motors, which travel through the air utilizing the little motor merely as an aid in wind currents that are unfavorable to soaring. We may not be flying altogether without mechanical help, but the need for a motor will be reduced to a minimum that will astonish those who believe that the future of flying lies in the direction of bigger and more powerful engines rather than in the finer improvements that will come from a more intelligent application of the fundamental laws of soaring or sailplaning.

Repairing Broken Teeth In Automobile Ring Gear

When a differential ring gear is stripped of several of its teeth or corners thereof, it is usually discarded and a new gear installed in its place, at a considerable expense.

This need not be the case, provided one can secure the services of a good electric welder.

Electric welding only is to be advised, as the job is far better and more reliable



than acetylene. The built-up metal is cleaner and stronger with the electric-arc type of welding.

The metal rods used in the building-up process should be relatively low in carbon and high in manganese. The result will be a strong, tough tooth that will not break under normal strain or usage.

After all the broken teeth and corners have been built up, the excess metal should be dressed off on an emery wheel to conform to the faces of the gear.

Next, the surplus metal yet on the tooth must be chipped off and the tooth filed to shape. This job calls for good workmanship on the part of the mechanic, as the profile of the renewed teeth must be exactly that of the good teeth. Many mechanics have tried to recut such built-in teeth only to ruin a good milling cutter. Now, by those who know, all rebuilt teeth are chipped and filed to shape.

A flat gage of thin sheet steel will prove of great assistance in bringing the teeth to correct shape and size; such a

gage can be made to fit on the top tooth line while a second gage can be made and used for the pitch line. A proving gage is made by casting a lead block on or between two good, unbroken teeth as shown in the illustration.

This gage is used to test with after the teeth are presumably finished and is used to check up with so the completed, rebuilt teeth will have perfect form.

When replacing the repaired gear in the machine, check the meshing and adjust to a perfect alignment with a minimum of lost motion.

Gears so repaired cut down the heavy expense of new parts and will often run entirely through the life of the remainder of the mechanism. One caution, well to remember, is to entrust the job only to a reliable electric welder.

Can You Identify Your Car?

No doubt the average motorist if asked this question would answer "yes," positively. But is he sure? The police would as positively disagree with him.

The majority of owners depend upon a bent fender or odd bolt for identification, or some other equally uncertain marking. Many depend upon the motor and body number alone. But after the modern thief makes over a stolen car it would be impossible to identify it by any such means.

Every motor car factory is turning out thousands of cars of the same model that do not vary in any appreciable degree from one another except for the paint. This complicates positive identification even further. The expert thief will change all broken or damaged parts, change the numbers, repaint the car and then defy the owner of that particular car to identify it.

Identification marks should be placed on all separate units of a car, such as the motor, transmission, rear axle, etc., in the most inconspicuous places. Another suggestion would be to loosen the upholstery for a few inches and insert your typewritten address. Hundreds of other methods will suggest themselves when you think the matter over.

The important point is that every car owner should have some marking on his car which cannot be easily changed.

Dare-Devs of the Magic Box

(Continued from page 77)

Carl Wheeler Fasold probably has "shot" as much "big stuff" for the news reel screen as any man living. He had already made a brilliant record with the "still camera." In 1911, after cruising a rough sea nights and days, he was the first of his guild to meet the *S. S. Carpathia* and photograph the survivors of the Titanic disaster. Once started on the subject of his chosen life-work, Fasold warmed up after this fashion: "I soon found myself chasing around in company with the most distinguished visitors to our country, reporting their activities. Several times since the signing of the armistice, I have crossed the ocean for exclusive news 'shots.' I have traveled de luxe and under all sorts of hardships. One never knows where he will be sent or when he will return."

Harry D. Harde is another member of the camera staff who becomes interesting when persistently urged into writing about himself and his job. "I soon discovered," he writes, "that in the life of a news cameraman thrills and dangers are never lacking. One of my hardest tasks—one in which it was necessary to risk my life—was when the oil tanks at Hoboken exploded and the army piers burned down. It was a man-sized job to get on the scene at all, with flames and explosions on all sides. Having lost my camera crank, I was compelled to use a piece of wire with which to 'grind,' but came out with a whole skin, somewhat scorched, and a fine picture".

The news camera work of John Thomas Baltzell has filled "fans" with many different kinds of thrills. Considering that he was not born until 1896, his record is impressive. Beginning his camera news work for Pathé in 1918, his duties saw him in the thick of all the important post-war events, conferences, and ceremonies. Baltzell is an accomplished optician, electrician, chemist and engineer.

"The number of times I have flown for 'stunt' pictures, I can't remember," writes John A. Bartone, of a camera staff since 1918. "As for climbing for what I'm after, that's my middle name. I have 'shot' from the most dangerous position on the tallest buildings in this country

and elsewhere, and climbed the tallest towers for elevation shots."

Editor Cohen, of Pathé, was asked by the writer to tell how he made up his news reel. What rules he followed in determining the value of the film subject. He said: "Perhaps it would surprise the public to know that if all the scenes I receive every week were pieced together they would represent several miles of news pictures. Yet we use less than one-fifth of one mile. A full news reel is one thousand feet long and only takes about twelve minutes to show. It consists of from ten to twenty subjects. Each subject is of differing length. Sometimes I receive two hundred feet of a certain subject, but use only ten feet of it—a flash—because I have found by experience that that particular subject will hold the interest of the audience only for several seconds. Other times so many newsy shots arrive simultaneously that it is difficult to find room for them.

"You may think that the news reel is changed only twice a week, but on the contrary in the larger theaters it is changed almost every hour so as to include some news of pictorial bigness. In the theaters of the larger cities, all the news reels are taken by the exhibitors and only the best portion of each is shown in the one condensed reel. I find that the public reacts best to great political, economic or social events; great physical events, such as the Pueblo Flood—people all over the world were interested in this and how relief was rushed to the sufferers—fires, explosions, Volcanoes in eruption, avalanches; scientific progress; human interest—a blinded soldier knitting—a trained earthworm, spectacles or navy airplanes sinking former German battleships.

"I have no hard-and-fast rules. I suppose a trained news sense helps me in deciding. I am glad that at last the news cameramen are going to receive recognition. They deserve it. They never falter nor refuse an assignment no matter what personal risk is involved. Their exploits make an unending story of achievement. Every hour sees a fresh chapter written."

Replacing Sash Cords of Windows

by W. P. COLEMAN

ONE of the simplest repairs about the house is one that you hesitate to tackle—replacing sash cords. The ordinary woven clothesline makes an excellent sash cord, and only enough to reach from the pulley to the bottom of the window frame is needed for each side of each sash.

To get at the weights it is necessary to remove two strips from the bottom of the outer groove. The outer groove is that in which the upper sash moves, and the strips are screwed with a single screw about six inches from the sill. The screw may be covered with paint but a little judicious scraping will reveal it and prepare it for the screw driver. Remove the pulley at the upper end of the frame only when inserting the cord for that particular pulley.

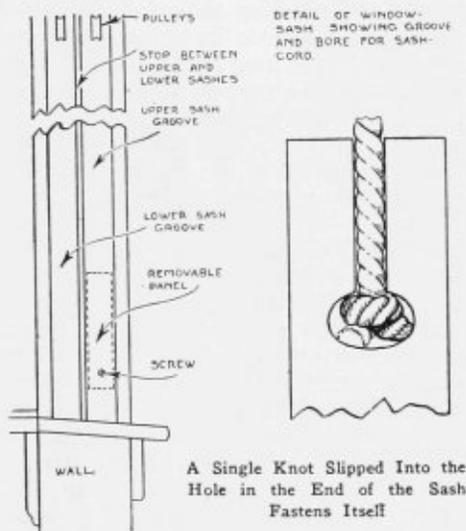
If the distance from the top of the pulley to the window sill is 5 feet you will cut your cord in lengths not less than 5 feet. A few inches longer is all right as you can take up the extra length by tying knots on the weight and in the knot which holds cord to the sash.

It is necessary to remove one side strip that keeps the lower sash from falling into the room. This can be done with a wood chisel. The lower sash is then worked out and the cords removed from the sides of the sash; the cords are held to the sash by knots fitted into a groove or drilled hole. Sometimes a small nail is driven through the knot and into the wood, but this can be pried out by slipping a screw driver under the knot. When the cord is freed from the sash, allow the weight to pull the knot up against the pulley; do not let go of the cord until the knot is held by the pulley, as the jerk of the weight may snap the old cord and you'll have to buy a new weight or dig the old one out of the walls.

One of the outside stops between the lower sash groove and the upper must next be removed. This can be pried out with the corner edge of a wood chisel and the sash removed the same as the lower.

If the old cords are not broken you can tie the end of the new cord to the pulley

end of the old one (after slipping the pulley off the cord) and thus pull the new cord into the weight runway. As soon as the cord shows in the opening near the bottom of the frame, slip the pulley over the other end and knot the cord so that it will not drop into the runway. Cut the old cord from the



weight and knot the new one. Do the same with the opposite cord. When both cords are ready, fasten them to the sash and drive a small nail through the knot and into the wood. Then put the upper sash into position and replace stop.

The same method does for all the windows, except that cord lengths may vary. In case the old cord has been broken, it may be necessary to fish the new cord into the runway by means of a light string and a weight.

To Remove a Screw with a Broken Head

When half the head breaks off a screw it looks as if it would have to be dug out. Instead, get a piece of hard wood with a square end. Place the driver in the screw head, press the piece of wood hard against it at the bottom and turn. Most screws will come out if sufficient pressure is applied.

How They Build Plays in a Week

(Continued from page 133)

he was about twenty-eight years old and very dapperly dressed. Goodness how he has changed! He is about sixty now and we could almost swear he came from Kilkenny or Cork.

We are now witnessing the magic of make-up, costume, lighting, scenery. The final touches have been given in some way we know not.

The first night does develop some quaint and startling things sometimes—things the audience may not be wholly aware of. Not long ago a certain stock company gave a play in which there was to be a fist fight between the leading man and the juvenile. Not much rehearsing had been given to the fight, which bit of stage business is always a ticklish affair. In the movies they can be done realistically because they happen only once in a script and no actor objects to a good rough-and-tumble once in a while. But ten times a week is another thing. In this particular instance the leading man checked up at about what the sporting world would call a light heavyweight. The juvenile was a fair lightweight.

The leading man plays very strenuously. He puts plenty of pep into his work. On the opening night in question he swung once and hooked once. When he looked down at his opponent (a very good personal friend by the way) he was horrified to see real honest-to-goodness blood trickling down his friend's chin and his right eye fast closing. The lead was so upset he forgot his lines for the moment and went on with difficulty.

The quaint part of this little episode was this. In the review of the play the following morning the critic of a paper of excellent standing found fault with the fight scene as "not being realistic enough." The juvenile took great pleasure in showing this writer a beautiful black eye and a split lip as his part gained in a fight "not realistic."

An illustration can be given here which will show the terrific amount of memorizing an actor must do. Those of us who have committed to memory "Lincoln's Address at Gettysburg" (and who of us has not) can sympathize with the actor who has many speeches. The famous speech of Abraham Lincoln con-

tains 269 words. A great many of us can remember what a stumbling-block this speech was and how much a young human being can suffer while giving it.

Here is a play in three acts and the speeches of four of the main characters tabulated. The lead is a hard character part. It has in all 263 separate speeches divided as follows: 157 in the first act, 89 in the second act and 17 in the third. One of these speeches in the third act contains 553 words and another in the second act has almost as many. Of course, some have only 10 to 20 words. The heroine has 52 speeches in the first act, 71 in the second and four in the third. The villain has 46 speeches in the first act, 85 in the second and 21 in the third. The hero has 59 in the first act, 21 in the second and four in the third. These, of course, vary in length from a simple declaration of a few words to a long, impassioned splurge of oratory.

Granting that the work is heavy, the actor in stock does have certain perquisites that his brother who plays a road show doesn't get. First, he can have a home. Home means something to an actor; more perhaps than it does to those who have always had one fifty-two weeks in the year. No beastly traveling in railway cars, no hotels with their varying degrees of excellence (?), no one-night stands. He can live as other people do—which is his fondest dream.

Next, he rarely has to face a hostile audience, a thing any actor dreads. The same folks go every week to the stock theater, have the same seat. Audiences in these theaters have a sort of family flavor, hard to define exactly, but they are different—generally decidedly friendly. This gets over the footlights to the actor, never fear, and it spurs him on to greater efforts. He feels he can't bear to give a mediocre performance because they are his friends out in front and have come to see *him*.

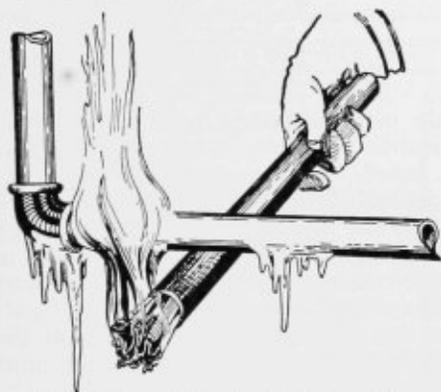
Then there is the variety of it all. No playing one part day in and day out without change. If his part one week is obnoxious to him he knows that next week he will probably get one more to his liking, something he can really delight in.

Tool for Thawing Frozen Water Pipes

Thawing out frozen water pipes in the winter is sometimes necessary but, if the method here told of doing the work is followed, it can be done with the least amount of discomfort. Old newspapers, when used in the holder illustrated, are excellent for the purpose.

Get a piece of 2-inch pipe 2 feet long and roll a newspaper tightly into tubular form, using several sheets of the paper and of sufficient size so that the roll will fit tightly into the interior of the pipe. The idea is to have the paper fit not too tightly so that it can be poked out as it burns away. Owing to the air exclusion, the paper will burn slowly. It should project about two inches from the upper end of the holder-pipe and the projecting paper set aflame. Pass the flame along the frozen pipe and, as the paper burns away, poke it up a bit with a stick inserted from the lower end of the holder.

This not only gives a hot flame but prevents the paper from burning up quickly. By this method of thawing pipes the flame can be controlled, making it much safer and causing less fire hazard to property and persons.



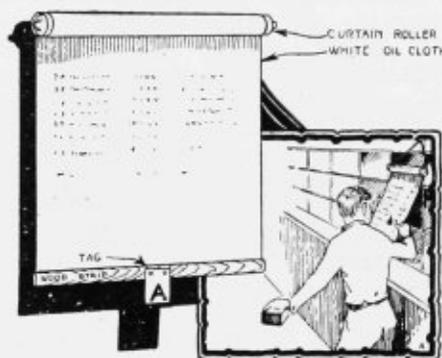
A Safe Means of Thawing Out Frozen Pipes

So many water pipes freeze up every winter that this new and safer method will no doubt find favor with numerous persons who will be compelled to resort to some means of restoring their halted water supply. If one must use direct flame as advocated, it is always best to see to it that no inflammable material is within reach of the slight sparks that may drift from the burning paper.

Price Lists Are Handy on Rollers

Confidential price lists are examined frequently by those not entitled to see them, simply because they are left lying about in an open manner.

One manufacturer overcame this in a



great measure by putting the price lists on rollers.

He tacked several strips of white oil-cloth to strips of wood as long as the oilcloth was wide. Then he tacked the other ends to curtain rollers.

The prices were printed upon the oil-cloth with India ink and the rollers were hung in brackets exactly as if they had been installed at a window. A metal tag was tacked to the stick at the lower end of each list and numbered for reference.

The price lists were always kept rolled up but could instantly be pulled down for inspection. The mark on the tag identified the list so that all the rolls would not have to be pulled down to find the prices sought for.

Old Books Make Good Bill and Photograph Files

If you have a few old books with solid cardboard covers that you contemplate throwing away, you had better change your mind and save them. With only a little trouble they can be converted into excellent files for bills, letters, photographs, etc.

Remove all the leaves from between the covers and throw them away. Cut three pieces of thin wood as wide as the book was thick, and tack to the edge of one cover and back binding so it forms a box with a hinged cover similar to the old-style letter files so commonly used several years ago in offices.

How Canada Teaches Her People

(Continued from page 56)

ized," advised Prof. F. H. Sexton, in charge of vocational education in Nova Scotia. "It appears that industry itself will have to take some share in this burden and that a good part of the learner's time will have to be spent in a factory in regular commercial production.

"Modified apprenticeship systems suitable to modern conditions will have to be evolved which are fair both to industry and to the learner. The time is ripe now for such a cooperative effort. Employers must have skilled workers, and it is not just to expect that a few corporations or the public school system will produce all of them.

"Technical education as it has been developed so far in Nova Scotia has proved to be of great benefit to the province, to industry, and to the individual worker who has availed himself of the advantages offered," continued Dr. Sexton. "It is practically the only thing which has been wholeheartedly endorsed by both employer and employe. The progress in this branch of education has been steady and sure. In the days of bitter commercial competition between the nations which are immediately ahead, technical education is clearly one of the most powerful instruments for success which civilization has yet developed.

"Great strides are being made possible by the generous assistance of the Dominion of Canada to the provinces for the extension of vocational training, but greater efforts must be put forth in the future by industry itself in cooperating with school authorities to insure the adequate training of its workers, so that Canada may maintain itself in the economic struggle and win that place which her resources together with the intelligence and capacity of her people entitle her to assume."

And what Dr. Sexton sets forth as true in his country is certainly doubly true here in the United States. If America seriously intends to retain that commercial supremacy which she has achieved, she must train technically—that is, train in specific, practical sciences which have to do with commerce and industry—many times as large a

number of young men and women as she is training today.

For both commerce and industry are sciences. They are no longer matters of mere energy and loud hollering. Sciences must be studied and mastered. Instinct cannot make a man an expert in any line. It can only give him the impulse to become one.

Like our sister to the north, we have almost unlimited natural resources, which means that we possess, like her, a storehouse of opportunities awaiting harvesting by scientifically trained men and women. We possess the storehouses and can obtain the key which ultimately will open it, and no substitute can be advanced, save the intelligently equipped individual using modern improved methods.

The growth of industry in Canada as a result of the World War demonstrated very clearly that wasteful methods had been adopted. The lesson Canada learned as a result of her war experience, but which too few leaders in the United States even now seem to appreciate, is that this extravagant waste must be eliminated either through perfection of existing production methods or the creation of new ones.

But who will do this little task? It is a scientific problem, and can be solved only in an industry based upon sound scientific principles. And that industry, so based, will be possible only when technically trained men lead in every detail. The country with those men in charge of affairs will lead the world in industrial supremacy in the future, and those not so equipped with trained leaders and workers will trail along at the end of the parade, no matter how much money they have in their banks.

Accordingly, Canada shows great wisdom in training her men and women for definite life tasks, for the other victories will surely come as the reward of the intelligent, trained worker.

The urgent need of the training of people for life work was clearly brought to light in the survey which New Brunswick made and which may be taken as typical of nearly every section of the American continent.



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Is Your Future in Electrical Engineering?

(Continued from page 73)

ational director's office he was there again—with a note of recommendation from his superintendent.

"How about your schooling, Roody?" asked the man of education.

"Try me," invited the young man. "I've been plugging at home for a year, besides working in the plant. I can pass your examination, 'cause I'm on my last lesson of an E. E. course in a correspondence school and I can tell you a whole lot about the works, too."

That was five years ago. Today Roody Grogan, as first assistant to an electrical engineer, is drawing five thousand dollars a year. This, of course, is a record climb—but it shows what can be done. Roody's specialty is designing and installing turbine dynamos, and already he has had drawings accepted by the production department of the great concern in which he works.

In this great works there are no less than half a hundred young technical experts who secured the actual foundation for their technical and scientific training by home study. And in the three great electrical works named, there are no less than four hundred young workers educating themselves at home, preparing the foundations upon which the schools and classes maintained by their employers may build.

So, while it must be clearly understood that the profession of Electrical Engineering calls for a long and thorough training and for years of practical experience as well, it is a profession open to all naturally equipped to succeed at it. For those whom nature has not fitted to follow technical work, electrical engineering has nothing to offer.

If you do not enjoy mathematics, if physics is not for you, or if you have not the patience to expend untold labor and persistence on technical problems—your place and your future most decidedly is *not* in Electrical Engineering. But if you feel that the studies of science are your forte then you can enter the electrical field assured that though the path to your goal, that of electrical engineer, is long and hard, there are many pleasant and well-paid steps leading to it, and that you will be able to earn more than a

comfortable living long before your employer tacks the official title "Electrical Engineer" after your name.

And because there are so many pleasant and profitable stations en route and because there are so many pleasing by-paths leading from the hard, arduous route to your goal, about 99 per cent of the starts never arrive at the door marked "Electrical Engineer."

This does not mean that ninety-nine out of every hundred young students fail in their efforts to carve positions for themselves in the electrical world. Far from it. It simply means that only one of the hundred manages to resist other work that beckons en route and plugs straight on to the goal that some concerns designate as "General Electric Engineer" or "Chief Electric Engineer" or "Chief of Electric Designs and Production" but which, in plain English, is that of Electrical Engineer.

The jobs and positions you may pass through en route to your goal—one of which you may stick to—are legion. Among them are electrical salesman (a thorough grounding in electricity being necessary for this), field installation man, field estimator, field designer, service expert for radio, electric locomotives, telephones, factory motor unit installations, generating plants, municipal lighting plants and small independent manufacturing concerns using company's equipment, and so on.

Then in the plant there are the designers of machinery and equipment of all kinds; there are estimators for load carrying calculus; there are production engineers and operating engineers; there are chemists and there are metallurgists and specialists in hydroelectric generating machinery and service.

There are also the inventive designers and the members of the experimental corps and of the Board of Review that passes on the various improvements and developments offered. And on this Board you will find the electrical engineers, the men who must oversee every department, who must understand every phase of the work, whether it be the labor of the calculus expert who figures

(Continued on page 156)

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Is Your Future in Electrical Engineering?

(Continued from page 154)

the complex problems of stress and torque and load and friction and magnetism and corrosion and static loss; or whether it be the deft skill of the draftsman, the accuracy of the field estimator, the soundness of the salesman or the practicalness of the inventor.

Yes; the electrical engineer has a job—an honest-to-goodness job, with plenty to do. But the long, hard pull he has had making the grade has given him reserve power that carries him through to the top.

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According to those who know, no matter how much or how little one learns in this profession, in the science of electricity, he can always apply it with profit.

For we are letting "electricity do it" these days.

The Child's Day in Court

(Continued from page 43)

lic records. These records have to be available to anybody who wishes to consult them. The public record, therefore, gives only the necessary minimum of information. The complete record, including the social history compiled by the court's investigators, psychopathic reports if such exist, and other data, is kept private. This prevents any unnecessary humiliation for the delinquent.

Probation with these various precautions rationally used really means something. It is not merely one easy way of disposing of cases. It is the way that appears best, in view of all the facts, for the particular case. Of the offenders put on probation in Judge Arnold's court 90 per cent make good. This surprising percentage would not be possible without the careful investigation and thorough social history.

No human administration of justice can be perfect. Under even the wisest supervision, some delinquents offend time after time, refusing to respond to discipline and graduating at length into the class of adult criminals. Work with juvenile delinquents must therefore be judged by the number of times it succeeds, rather than by the frequency of failure.

Congested and foreign centers in the cities are peculiarly likely places for the spread of juvenile delinquency. Judge Arnold recognizes a great opportunity for civic or private work in the centers where delinquency thrives, with a view to preventing it. He has identified him-

self with various activities having this purpose. Striking results have been obtained in at least one case. Certain members of the Union League Club of Chicago determined a few years ago to do something for boys. At their request, Judge Arnold had a spot map of the city made to show the prolific centers of juvenile delinquency. The map demonstrated that a certain region, in the neighborhood of the Maxwell Street Police Station, was the center of more juvenile delinquency than any other portion of the city. In that one section there were thirteen hundred juvenile offenders on probation.

As a result of the survey, the Union League Club for Boys was established here. Its backers secured an old hall, once known as "The Bucket of Blood." They installed the facilities of an up-to-date club. Membership, they decided, should be open to any boy who paid the monthly dues of five cents. The Club was to have only one rule: "Be a gentleman." But that rule was to be enforced.

The Club has developed into a place where hundreds of boys get healthy recreation and associate congenially. The results can be stated, in part, statistically. After one year, a second spot map was made, and it was found that Court cases of juveniles in this district had been reduced 76 per cent.

I know of no case of an individual in which the constructive character of the Chicago Court's work is better illustrated

(Continued on Page 158)

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The Child's Day in Court

(Continued from page 156)

than the case of—call him Charles, for convenience.

Charles was an incorrigible delinquent. The officers did not know what to do with him and they said so frankly. He had been committed time after time to various institutions. But it appeared to do no good. No sooner was he released than he was found guilty of some new offense and committed afresh.

His final offense was picturesque. He escaped from the school in which he was being detained at the time. He strayed at once to the heart of Chicago and, without delay or asking permission of the owner, he drove off with a fine large car that caught his eye. He rounded up four or five boy friends. This party then speeded for the school from which Charles had just escaped. They passed at some forty miles an hour, with the cutout open and the siren shrieking, waving, and shouting taunts and jibes at the boys inside!

In a few days Charles was apprehended and brought before Judge Arnold, who was new to the Juvenile bench at that time. The Judge never admits that a delinquent is entirely beyond hope. He felt in the case of Charles merely that the right kind of discipline had not yet been found.

He took Charles into his chambers to talk it over. "I don't know what to do with you, Charles," he confessed frankly. "It begins to look as if you would have to go to Pontiac. I should think you'd begin to feel ashamed of yourself. You're nearly a man now; surely you can't help realizing that these fool tricks only get you into fresh trouble every time. They don't get you anything else that I can see."

Charles did not try to excuse himself; and he asked no favors. He did not deny that he had committed the various offenses of which he had been accused. The talk drifted. Judge Arnold has a way of letting it do that, when he is trying to discover what motivates the offenders who are brought before him. Presently Charles fell to talking about automobiles.

Charles, the Judge soon discovered, had at one time or another stolen nearly

a hundred cars. He had no mercenary motives; only a distinct liking for cars.

"How would it be," Judge Arnold asked at length, "if I got you a job in an automobile factory. Then you could save your money, Charles, and buy a second-hand car of your own. You go back to the school and finish your time there. When you are through, in a few months, I will get you a job. How about it?"

"It's a bargain!" Charles replied; and his eyes looked from under his red eyelashes straight into those of the Judge.

"I'll count on you."

The Judge sent Charles back to the school without an officer.

Two weeks later the Judge visited that school. At the end of the street-car line, half a mile from the main gates, he found Charles at the wheel of the school car, alone, and waiting for passengers.

The lad was discharged from the school in time, and he came straight to the Judge. In his hearing, the latter dictated a letter to the manager of an automobile company. After telling about Charles and his record, he concluded with these words, "This boy is now thoroughly trustworthy."

"That," he said, turning to Charles, "is pretty strong language. But I guess I can count on you to make it good."

"That's what I agreed to do!" Charles replied.

The boy secured the position. He saved his money. Quite often he came to see the Judge. He did not buy the second-hand car with his money, even when he had enough to do so; but he was never again an offender against the law. He was one of those caught at the turning point, almost when he seemed lost.

Of all the waters in the ocean of childhood, only a very, very small part is ever washed up on the beach of the Juvenile Court. The line between the child who keeps within the law and the child who gets into trouble may be very fine, but it is of infinite importance. It is the line drawn by honest standards in the home; by parents or others who direct the abundant energy of childhood into useful channels instead of letting it drift into idleness, vice, and crime,

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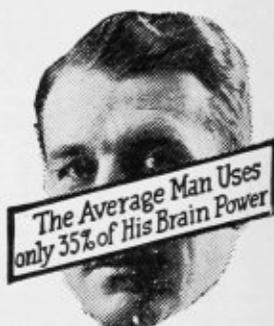
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R. T. MILLER, Jr., Publisher

Publication Office:

Drexel Avenue and 58th St., Chicago, Illinois

Eastern Advertising Office:

171 Madison Ave., New York City

Advertising Office:
Peoples Gas Building, Chicago

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Dear Reader:

"What's the matter with the movies?" You probably have asked this question, like many other movie "fans" in all parts of the country. With this in mind, we asked Rudolph Valentino, the famed star of the screen, to answer the question for us, and this he does in a striking article which will appear in the May issue. He not only gives you "inside information" of conditions existing in the motion-picture industry that you will find highly interesting reading, but he also tells you what he is trying to do to help remedy them. In this connection, William Fleming French presents an intimate sketch of Valentino, the man, based on personal contact, that gives you a true picture of this much-discussed star.

"Is the Female of the Species More Deadly Than the Male?" Frank Braden disclaims all knowledge of its application to humans, but he does know whether it is true among performing wild animals of the circus. He deals with the subject in his characteristic graphic fashion in the May issue.

These are only three of the many features in the forthcoming number. The boys' department will include a special feature which gives detail drawings and description for the building of a sail-plane. This article will be a treasure find for any youth with construction ability.

The automobile department in May has many worth-while articles for motorists. Lowell R. Butcher tells how to discover and eliminate the squeaks and rattles in your car. Another practical article tells how to remove carbon from the motor. You probably would like to put your monogram on your car. It is an easy matter, if you follow directions given in one of the May articles.

Look the May issue over. You'll like it.

Yours for the best magazine,

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Editor.

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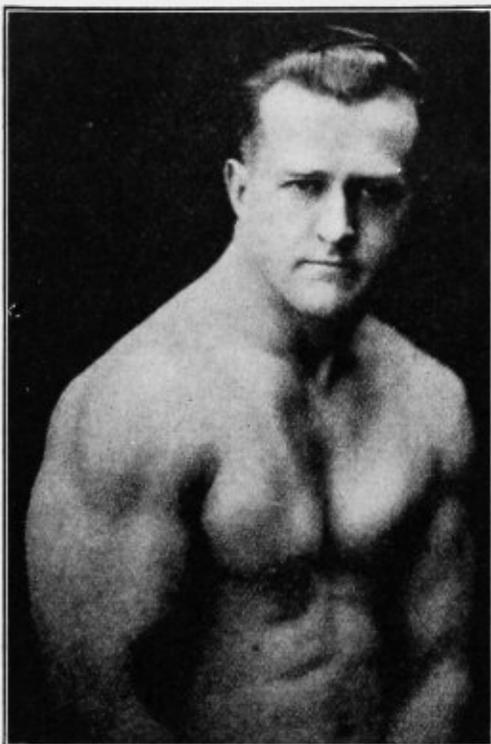
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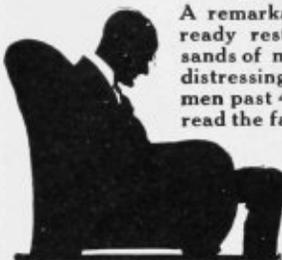
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No longer will housewives be chained to a dirty, mussy coal and wood fire, in a sweltering kitchen all Summer. Already over 150,000 women have equipped their old ranges with this amazing new invention—the **Oliver Oil-Gas Burner**—that makes any kind of range or cook stove a real gas range. No more hot kitchens all day long just to cook a few meals. No more ashes, dirt, soot and smoke or dirty coal scuttles. No more expensive oil stoves that never bake like the real range, and fill the air with a sickening odor. No wonder housewives all over the country are demanding this wonderful Oliver. And no wonder our representatives are cleaning up fortunes supplying this big demand.

The Oliver Sells Itself

Agents find it no work at all to sell this amazing invention. Just one minute to connect and light it—the sale is made. Every woman wants this wonderful work saver that dispenses with coal and wood and is cheaper—because it burns 95% air and only 5% kerosene (coal oil).

Right in her own oven, the housewife can bake delicious cakes and bread better and more quickly than ever before. She can regulate her oven at any temperature, for quick baking or slow baking. Then, turn



off the heat, and the kitchen is cool and clean the rest of the day. Preserving and Summer canning is done with 1-6th the work of the old way. No wicks, no grimy hands, no needless steps, no watching.

The Secret of Quick, Big Profits

You can see the possibilities that this timely invention offers for making big money during the Summer months. A. R. Slade made \$13,500 in three months. The last two months we paid over \$138,647 in salesmen's commissions. You, too, can clean up big profits if you will get started right away. An opportunity like this may never come to you again in a lifetime. You don't need to be a high powered salesman or even a good talker. Every demonstration means a sale. Women call the Oliver a "God Send." They actually sell themselves.

Free Sample Case Offer Oliver Gives Fords Away

Thousands of dollars are spent each month, advertising Oliver Burners to housewives. Live wire salesmen are taking advantage of this opportunity to make a Summer's work yield them more money than they ever earned in a whole year before. Many make \$100 a week and more just in spare time. If you will write us at once we will give you full details of how to get Exclusive

Territory and our special Free Sample Case Offer. We are giving away Fords to producers—no contests.

Mail the coupon at once—every day you wait means money lost. Cash in on this big money-making summer proposition by mailing the coupon right now.

Oliver Oil-Gas Burner & Machine Co.,
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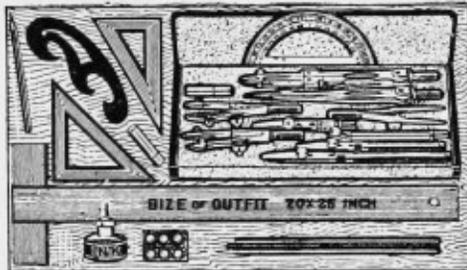
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Can You Guess This Man's Age?

See if You Can Tell Within 25 Years; The Author Couldn't; But He Stuck With Hobart Bradstreet Until He Revealed His Method of Staying Young

By WILLIAM R. DURGIN

I USED to pride myself on guessing people's ages. That was before I met Hobart Bradstreet, whose age I missed by a quarter-century. But before I tell you how old he really is, let me say this:

My meeting-up with Bradstreet I count the luckiest day of my life. For while we often hear how our minds and bodies are about 50% efficient—and at times feel it to be the truth—he knows why. Furthermore, he knows how to overcome it—in five minutes—and he showed me how.

This man offers no such bromides as setting-up exercises, deep-breathing, or any of those things you know at the outset you'll never do. He uses a principle that is the foundation of all chiropractic, naprapathy, mechano-therapy, and even osteopathy. Only he does not touch a hand to you; it isn't necessary.

The reader will grant Bradstreet's method of staying young worth knowing and using, when told that its originator (whose photograph reproduced here was taken a month ago) is sixty-five years old!

And here is the secret: he keeps his spine a half-inch longer than it ordinarily would measure.

Any man or woman who thinks just one-half inch elongation of the spinal column doesn't make a difference should try it! It is easy enough. I'll tell you how. First, though, you may be curious to learn why a full-length spine puts one in an entirely new class physically. The spinal column is a series of tiny bones, between which are pads or cushions of cartilage. Nothing in the ordinary activities of us humans stretches the spine. So it "settles" day by day, until those once soft and resilient pads become thin as a safety-razor blade—and just about as hard. One's spine (the most wonderfully designed shock-absorber known) is then an unyielding column that transmits every shock straight to the base of the brain.

Do you wonder folks have backaches and headaches? That one's nerves pound toward the end of a hard day? Or that a nervous system may periodically go to pieces? For every nerve in one's body connects with the spine, which is a sort of central switchboard. When the "insulation," or cartilage, wears down and flattens out, the nerves are exposed or even impinged—and there is trouble on the line.

Now, for proof that subluxation of the spine causes most of the ills and ailments which spell "age" in men or women. Flex your spine—"shake it out"—and they will disappear. You'll feel the difference in ten minutes. At least, I did. It's no trick to secure complete spinal laxation as Bradstreet does it. But like everything else, one must know how. No amount of violent exercise will do it; not even chopping wood. As for walking, or golfing, your spine settles down a bit firmer with each step.

Mr. Bradstreet has evolved from his 25-year-experience with spinal mechanics a simple, boiled-down formula of just five movements. Neither takes more than one minute, so it means but five minutes a day. But those movements! I never experienced such compound exhilaration before. I was a good subject for the test, for I went into it with a dull headache. At the end of the second movement I thought I could actually feel my blood circulating. The third movement in this remarkable Spine-Motion series brought an amazing feeling of exhilaration. One motion seemed to open and shut my backbone like a jack-knife.

I asked about constipation. He gave me another motion—a peculiar, writhing and twisting movement—and fifteen minutes later came a complete evacuation!

Hobart Bradstreet frankly gives the full credit for his conspicuous success to these simple secrets of Spine-Motion. He has traveled about for years, conditioning those whose means permitted a specialist at their beck and call. I met him at the Roycroft Inn, at East Aurora. Incidentally, the late Elbert Hubbard and he were great pals; he was often the "Fra's" guest in times past. But Bradstreet, young as he looks and feels, thinks he has chased around the



HOBART BRADSTREET, THE MAN WHO DECLINES TO GROW OLD

country long enough. He has been prevailed upon to put his Spine-Motion method in form that makes it now generally available. It costs nothing to try it!

I know what these remarkable mechanics of the spine have done for me. I have checked up at least twenty-five other cases. With all sincerity I say nothing in the whole realm of medicine or specialism can quicker re-make, rejuvenate and restore one. I wish you could see Bradstreet himself. He is arrogantly healthy; he doesn't seem to have any nerves. Yet he puffs incessantly at a black cigar that would floor some men, drinks two cups of coffee at every meal, and I don't believe he averages seven hours' sleep. It shows what a sound nerve-mechanism will do. He says a man's power can and should be unabated up to the age of 60, in every sense, and I have had some astonishing testimony on that score.

Without any payment whatever, would you like to try this way of "coming back"? Or, if young, and apparently normal in your action and feelings, do you want to see your energies just about doubled? It is easy. No "apparatus" is required. Just Bradstreet's few, simple instructions, made doubly clear by his photographic poses of the five positions. Results come amazingly quick. In less than a week you'll have new health, new appetite, new desire, and new capacities; you'll feel years lifted off mind and body. This miracle-man's method can be tested without any advance payment. If you feel enormously benefited, everything is yours to keep by mailing only \$3.00! Knowing something of the fees this man has been accustomed to receiving, I hope his naming \$3.00 to the general public will have full appreciation.

The \$3.00 which pays for everything is not sent in advance, nor do you make any payment or deposit on delivery. The trial is absolutely free. Requests will be answered in turn. Try how it feels to have a full-length spine, and you'll henceforth pity men and women whose nerves are in a vise!

HOBART BRADSTREET, Suite 456,
630 S. Wabash Ave., Chicago, Ill.

I will try your Spine-Motion without risk if you will provide necessary instruction. Send everything postpaid, without any charge or obligation, and I will try it five days. If I find Spine-Motion highly beneficial I can remit just \$3 in full payment; otherwise I will return the material and will owe you nothing.

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ILLUSTRATED WORLD

Vol. XXXIX

APRIL, 1923

No. 2

The Last U. S. Bugle Call "Over There"



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A Bugle Call That Was Heard Around the World—Sounding the Final "Last Post" on the Rhine

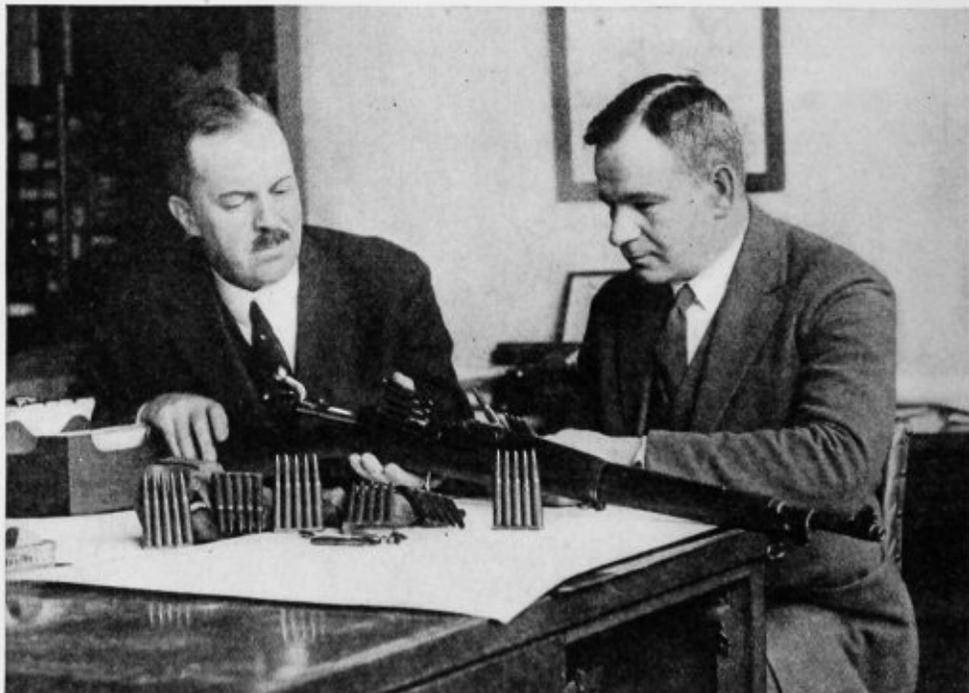


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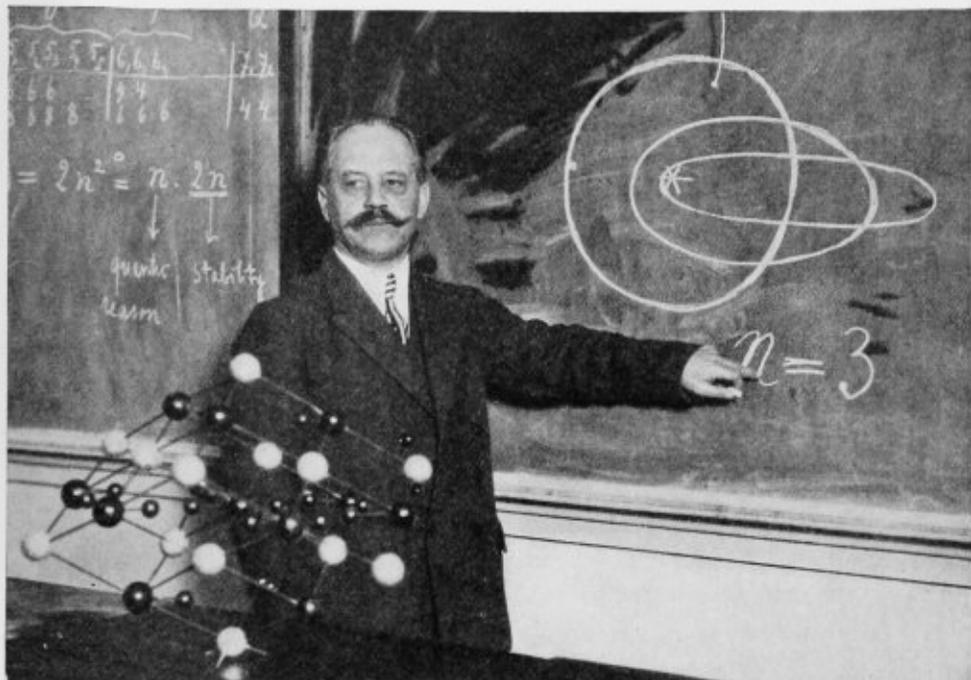
Judge Edward Terry Sanford, Tennessee Judge Who Recently Took His Oath as an Associate Justice in the Supreme Court. He Was an Assistant Attorney General in Tennessee Just Previous to His Being Elevated to the Bench. He Presided Over the U. S. District Court in His State For Fifteen Years



Dr. Charles P. Steinmetz, World Famous Scientist, Whose Startling Declaration That the World's Millions in Future Years May Be Fed Economically By Cultivating Vast Crops of Microbes Was Hailed With Enthusiasm by Scientists. Bacteriologists Assert the Idea To Be Practical



The War Department Has Just Invented a New Bullet Which Is Expected to Set a New World's Record for Accuracy and Range. The New Bullet Has Increased the Range of Ordinary Firing 1,400 Yards and Has Doubled the Accuracy. Major T. Whelen (left) and Major C. P. Wilhelm (right) Are the Two Men Who Have Done More Than Anyone in Perfecting the New Bullets



Dr. Arnold Sommerfeld, Physicist of the University of Munich, Has Arrived in This Country to Demonstrate Striking Advances in Scientific Knowledge Which He Has Unearthed. His Discoveries Deal With the Behavior of Electrons within Atoms and the Application of the Theory of Relativity to That Subject. Physicists the World Over Have Hailed the Professor's Work as of Vast Importance



A Valuable Instrument Has Been Added to Science by Frank Reiber, San Francisco X-Ray Expert. It Is Called the X-Ray Clock and Measures the Wave Length of All X-Rays. It Is Expected to Give Valuable Aid in Cases of Cancer

Fritz Thyssen, the German Industrial "Baron" Who Was Arrested, Tried by Court Martial and Fined 5,100 Francs by the French. Thyssen Would No Doubt Have Preferred Being Fined 5,100 Marks





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Miss Adelia M. Stewart of Washington Bears the Distinction of Being the First and Only Woman in the Country to Hold the Commission as a National Bank Examiner. She is Familiar With Every Detail of the Work, Having Worked Her Way Up From a Stenographic Capacity in the Treasury Department to Her Present Position



Upper Left—Mrs. Helen H. Gardner, First and Only Woman Civil Service Commissioner, Appointed to That Post in 1920. She Has Traveled in More Than Two Hundred Countries Collecting Data Upon Social and Political Conditions. She Is the Author of Many Books and Articles

Here Is the First Photograph of the Three Women Members of Congress, Taken on the Steps of the Nation's Capitol. Left to Right They Are Mrs. Winifred Mason of Illinois, Mrs. May Ella Nolan of California and Miss Alice Robertson of Oklahoma



© UNCLE SAM'S & UNCLE TOM'S

Miss Gladys Robinson, of Toronto, Splendidly Defended Her Women's National Senior Ice-Skating Title at the Chicago Meet Recently, Winning the 220-Yard and One-Half Mile Events in True Championship Style



When on February 7th Art Staff Took Three Firsts in the Big Indoor Meet and Later, on February 17th, Retained His Outdoor Title It Won Him the Right to Go to Norway to Race Oscar Mathiesen for the Indoor and Outdoor Championship of the World. He Has Grown Up from a Boy in Skating Circles



Johnny Weismuller in Action. He Is the Greatest Swimmer of the Day. On February 2, 1923, He Clipped $12\frac{1}{2}$ Seconds from the World's Record Mark Set by Dick Howell in the Latter's Race Against Norman Ross. Weismuller's Time in the Later Event Was 4 Minutes, 51 $\frac{2}{5}$ Seconds. He Is Slated to Depart for a European Tour During Which He Will Match Speed with the Swimmers Across the Water

Turning the World Back 3000 Years—

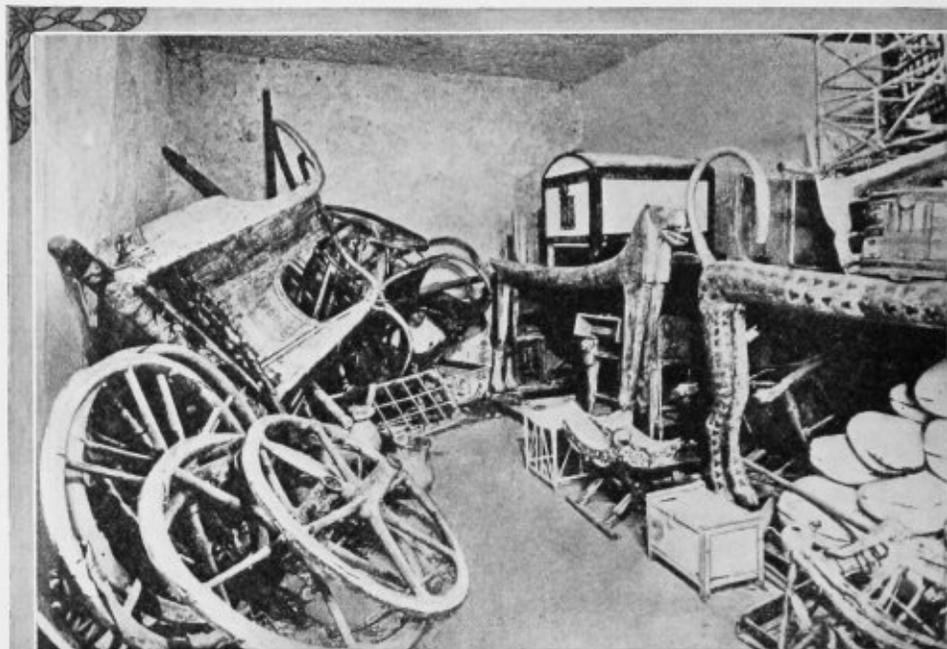


PHOTO LONDON TIMES-NEW YORK TIMES COURTESY BY ARRANGEMENT WITH THE EARL OF CARNARVON

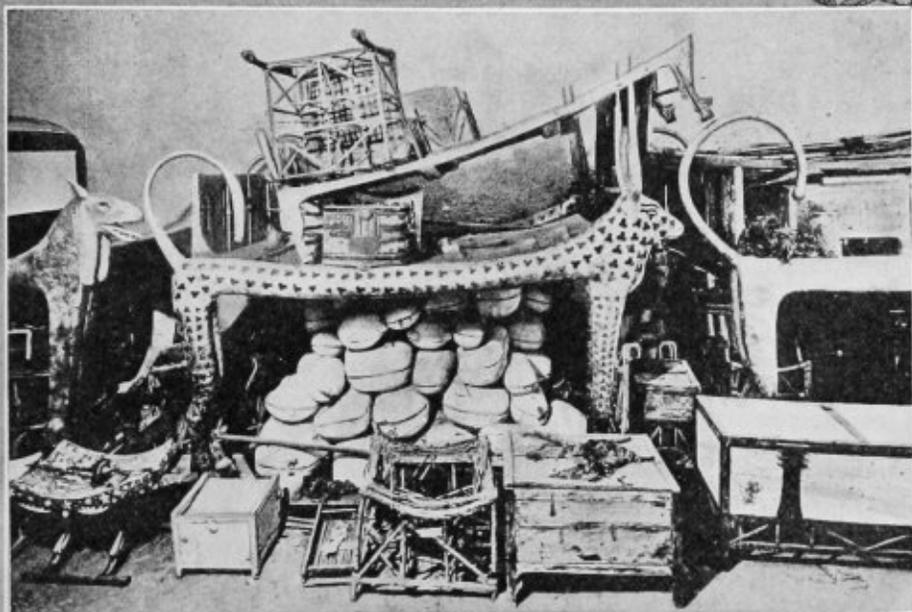
The discovery of King Tutankhamen's tomb in Egypt by the Earl of Carnarvon is the all-absorbing topic of world discussion today. The accompanying pictures show: Interior of ante-chamber, opposite the sealed door: On the right are two large ceremonial gilt couches. The nearer one has Hathor heads. The left hand couch is supported by animals as found among the demons of Egyptian mythology. Upon it is a casket bearing the protocol of the king and cartouches of his queen, Ankhsenamen. The

king's throne is under the couch and is inlaid with precious stones. Piled in the corner on the left, probably by ancient tomb-robbers, are the parts of four chariots the bodies of which are finely carved, inlaid with ivory and colored glass and embossed with gold bindings. Lower Left—Cluster of king's alabaster unguent-vases of



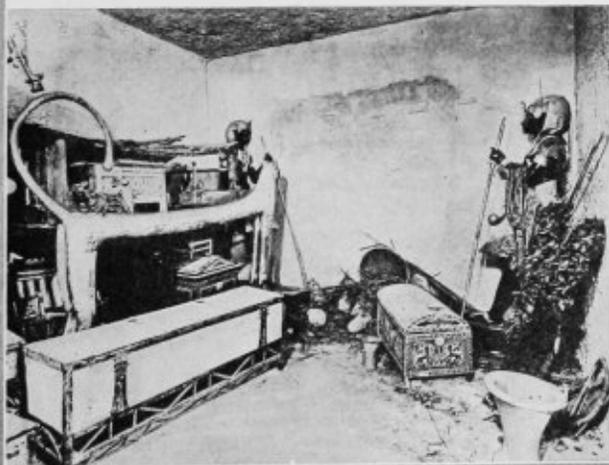
unique and superb type. Lower Right—Looking down the rock-hewn passage leading to doorway of the ante-chamber

Unearthing King Tutankhamen's Tomb



Looking south in the ante-chamber: The Hathor-headed couch under which are cases containing mummified joints of meat, haunches of gazelle, liver, and trussed ducks—food for Tutankhamen's soul. On the couch is a bedstead, stools of wood, a papyrus chair, a superbly inlaid semi-circular box and two sistra that ring musically. Under the head of the couch, at the right, can be seen the unguent-vases shown on the opposite page. The vases are flanked with open-work lotus and papyrus device that signifies the binding together of Upper and Lower Egypt. On the margins of this work are

The lower illustration shows the ante-chamber, looking south. The two statues of the king are magnificently carved in wood and are covered with a black pitch-like material in accordance with ancient sepulchral rites. The headdress, collarette, armbands, mace and staff are heavily gilded. They guard the sealed door, behind which the king's mummy is believed to have been found



WILLIAM HODGE—HIS MESSAGE

by WILLIAM FLEMING FRENCH

William Hodge is familiar to all of us as one of America's most successful players. And now he is cast to the role of playwright.

But Hodge is more than a playwright; he is a man with a message. What his message is and what inspired its writing is told in the following intimate article.

Whether or not you agree with Hodge's philosophy, Mr. French's presentation of it undoubtedly will hold your interest.

WHY the public has developed such an acute interest in its spiritual and psychological self just at this time no one can say, any more than we can give a reason for the sudden contagion of orchestral entertainment. At any event, William Jennings Bryan, Monsieur Coué and Ted Lewis are battling it out. And may the best man win!

Now comes the redoubtable "Man From Home" modestly presenting a little play from his pen which he calls "For All Of Us." It is an unpretentious entertainment carrying a two-fisted wallop that promises to jar loose some of our most comfortable delusions.

William Hodge wrote his play to carry a message—a message so simple and yet so tightly tied to the universal truth that no one can miss it; none can dodge it. It has its foundation on a simple fact that is as undeniable as sunlight, as inevitable as darkness. Because it is so simple, so universal, so undeniable, you take from it just what you brought to it—it makes you admit the truth in your own language. It embraces every creed, every belief, every *ism* and every *ology*.

It's a religious message, this message of Hodge's—just the same as Theodore Roosevelt's slogan "Play Fair" was religious, and it is as widely applicable and as undeniable, too.

In his play Hodge starts to talk to you right where you live and you go on with him from there; whether you are a bishop or a heathen; a Gentile or a Jew; a fatalist or a scientist, a spiritualist or a sport; a saint or a sinner. No matter what you are, you must admit something—and that's all Hodge wants you to do.

Once you admit that, his message starts

working on you and shows you where you are going and why.

All of us know, irrespective of race or creed or hobby, that if we bounce a hammer off our heads it is going to hurt—that the lump follows the bump and if it isn't a lump it's a bruise. You believe that? All right, you are ripe for William Hodge's message.

And what is his message? That's just it—each of us sees it his own way. Each of us gets from it exactly what he takes to it and no man is capable of translating it to another. To the religious it is the explanation of their particular creed; to the practical it is a sane exposition of a fact long beclouded in allegory; to the successful it is a new meaning of success; to the failure it is the way out; to the unbeliever it brings a new light.

And Hodge himself? Well, he wrote what was in him demanding expression. And now he is discovering that we are all reading it according to our own lights. He is besieged, every day, by hundreds who are seeking more light. And he has discovered that they are not seeking information as to the why or wherefore of the play (that is perfectly plain to them), but are merely seeking verification and moral support. In short, they cannot quite believe they believe what they do believe.

They get the message and they realize that it applies to their own particular case, but they want to be assured, they want its author to say over for them the very thoughts they are thinking. In other words, they want their moral backbone stiffened.

And Hodge is doing just that—every day and every night. He is being forced

into the role of a master confessor and adviser. He has been elected inspirational director for his thousands of friends and for thousands he has never seen. And all the while the modest Mr. Hodge is wondering where it is going to stop. It is part of the bargain not in his contract, for being an oracle is not a part of his ambition. But the least we can say

of real recreation—but he believes it is up to him to see it through, and he is doing just that.

And now about the play "For All Of Us." Its name is self-explanatory. It was written for all of us and carries a message for all of us. From whence did it spring? Is it the result of personal inspiration or is it a nicely drafted bit of propaganda?

"It happened," says Mr. Hodge, "way back when Kingston, New York, was known as Roundout—when I was a boy of nineteen. The theatrical company with which I had been traveling disbanded there, and when its assets had been counted and the bad news dispensed, I discovered that I, along with three other lesser lights in the company, was stranded in Roundout.

"To make a long story short, things did not go so well; and if it had not been for the old fellow who let me sleep on a settee in the opera house I would likely have found my

way down to the river in my extreme disappointment. But the old fellow used to keep me cheered up as best he could and bring me something to eat in the morning. The rest of the day I hunted work and tightened my belt.

Two weeks passed thus. Then the black dumps hit me harder than ever and I wandered out along a country road—



William Hodge

for this genial actor is that he is too sincere not to be game and, in consequence, his hotel suite generally has the appearance of a mass meeting, a free clinic or a confessional. Here "The Man From Home" dispenses encouragement, information, inspiration, explanations and not infrequently a frank opinion or two. All of which is far from being Hodge's ideal

hopeless. I wonder how many of you know what it is to be hopeless—penniless in a town where you know not a soul, where you cannot get work and when your courage is about gone.

"There was another reason why I sought the country. I was ashamed to be seen around town. I was ashamed of my plight. I was a failure—no better than a common bum. Those were my thoughts, and they had me whipped. I had reached the point where I was ashamed to ask for work.

"So the loneliness of the country road was balm to me, only it did not keep me from thinking, and my thoughts were slowly turning toward the simplest way out—toward the cowardly way out.

"And this day as I sat on the top of a flower-scented embankment beside a winding, tree-shaded road, I buried my head in my hands and surrendered to dismal thoughts of failure and self-pity and shame. I hid my eyes from the bright sun and closed my ears to the song of the birds and the rustle of the leaves.

"The longer I mulled over my thoughts of shame and fear and failure, the more hopeless I became. When I heard the tramp of approaching horses on the hard road, I would not look up as I did not wish to let the passer-by see my hopelessness. I was ashamed and whipped and cowed, and I wanted to hide from curious eyes.

"So I kept my face buried and waited for the tramp, tramp, tramp of the horses to cease. But so slowly did they come and so long did they take in passing that I finally looked up—to see a funeral winding slowly past.

"The hearse had passed on, and the rigs of the mourners were creaking along below me. I could see the mourners, with their bowed heads and their attitude of bereavement. I could see handkerchiefs daubed to eyes and I could sense the strained silence of the occupants of those old hacks.

"Then I turned to the hearse again and watched it roll slowly up a little hill, to dip and start its solemn journey to the graveyard below. As I watched, strange thoughts came into my head. And with those thoughts came the greatest lesson I ever had—the greatest teaching I have ever known.

"A picture of the man in that hearse flashed into my mind. For him no more the sunlight, the fresh air, the scent of flowers, the call of the birds, the rustle of the leaves. His eyes would never again behold the blue sky and the billowing clouds; his ears would never again hear the strains of music or his lips touch cool, sparkling water. What would he give to be in my place right then?

"I realized that I was alive! I realized that I was in possession of youth and health and that my senses were keen to the joy of life—that the whole world and the future lay at my feet. And then I realized that nothing stood between me and success, between me and happiness, between me and anything I wanted. That is, nothing but my own weakness. I was a free man, possessed of a clear mind; I was my own master and my future lay in my own hands. Nothing bound me or held me down. I was not a criminal. I had done nothing dishonest—had nothing to be ashamed of. There was no reason why I should hide my face from my fellow man. I had as much right in Roundout as any man there and the same right to sell my intelligence, my labor, as anyone else had to sell his.

"My fear, my shame and my sense of helplessness had fallen from me. I was eager to go ahead and accomplish something worth while. I wanted to strip to the fight right then and there. I rose to my feet to hurry back to Roundout, to hunt up a job.

"All of us have experienced these reversals of viewpoint—not once, but many times. You know that inspiration has been born in you right in the midst of your most gloomy thoughts. It has happened to all of us. And when that happens, we put the grin back on our face, throw back our shoulders and hustle.

"That is what I wanted to do. Only I didn't. Instead I sat down again and figured the thing out.

"'Now look here,' I said to myself, 'what's the meaning of this, anyhow? It must mean something. It must be meant for something. I've had the dumps before and had them whisked away by some unexpected happening or some inspiration, just as they were this time. But they always came back.

"'Now what I want to know is where

have those dumps gone? What were they and what caused them? I'm just the same as I was fifteen minutes ago—not a thing in me has changed—yet instead of jumping in the river I want to dance along the main street. Half an hour ago I felt like a plugged nickel and now I feel like a million dollars.

“So it must all be a state of mind—plain imagination. If I can put myself in heaven or hell merely by a twist of viewpoint there must be something in this noodle of mine that controls my existence, that controls my feelings, that controls my strength, that controls my health.”

The boy of nineteen reasoned out a good many things. He found that his theory accounted for his getting a headache when things went wrong and for indigestion when he was in love. He discovered why the amiable Mrs. Quirk with one of the companies of his first days in the show business developed neuralgia when she worked up one of her famous ugly spells. He knew why a fitful temper caused jumpy nerves and all the ills that go with them. In fact he discovered the little truths that we all know—that disposition has a good deal to do with happiness and health. But he did not let the truth drop there, as most of us do. He carried it on, as his play “For All Of Us” plainly shows. And now those who go to see his play and get his message gradually reason farther with him.

Our brain, the show teaches us, must be divided into two parts. When we use the good part we feel good. When we use the bad part we experience the dumps and the general rottenness that goes with them. Knowing this, all we have to do is to lick the ugliness in us and we will always be happy and successful and healthy. And Hodge's message teaches us, too, that if we can lock up the bad part of our brain, seal it up and then shut off nourishment from it, we can starve it out and lick our troubles for good and for all.

Likely we have all reasoned this far—because we know we can, at any minute, dig up some old grievance or hatred and dwell upon it until we are perfectly miserable mentally and physically and in fit mood to do murder. In other words

we know if we feed the bad part of our brain it will just naturally swell up and take possession of us. We know, too, that when we think good thoughts and do good deeds,—using the good part of our brain—we feel in tune with the whole universe. We all reason that far, but few of us reason farther. And that's why, Hodge's show teaches us, there is so much unhappiness and sickness abroad.

You have learned the foundation of Hodge's play—the experiences of the boy. Now let's consider the contributory incident, the thing that showed him how to write his message.

Hodge had had a bad night. There had been disagreements and unpleasantness among his friends. A good time had been turned into a most disagreeable session and he was completely disgusted. A series of small annoyances had helped throw him out of step and put his nerves on edge.

He returned to his hotel to pace his suite nervously—unable to sleep. As he threshed the thing over and over in his mind, adding fuel to his disgust with each rehearing, there came to his ears a steady pounding from the street—the sharp click of steel striking steel, accompanied by shrill whistling.

It was past midnight. He was smoldering within, and ready to vent himself on somebody, somehow. He threw open the window to give the noise-maker a piece of his mind. Below him were several street workers, chipping their way through the cement of the pavement. It was cold out there and the chips of cement and stone flew with cutting sharpness. The men were doubled over, doing the hardest kind of labor. And they whistled!

Perhaps the funeral of those boyhood days passed before Hodge's eyes again. At any rate he slowly pulled down the window—heartily ashamed of his mood. Here he was surrounded with every comfort, stewing and raving and embittering himself, while below him, in the dreary street, men labored in the cold—whistling.

Then and there Hodge's message began to form in his mind, and then and there the plot of his play was developed.

(Continued on page 292)

CARTOONIST VIEWPOINTS



LOOKS AS IF WE WERE GOING TO HAVE TO TAKE THIS THING SERIOUSLY

DABBING in the DES MOINES REGISTER



IT'S ALL RIGHT TO ENCOURAGE FIDO, BUT— LET'S NOT FORGET THE FACT THAT WE HAVE OTHER RESPONSIBILITIES

*CEP in the DAVENPOTE DEMOCRAT



THE FAMILY FLAPPER!

THELMA in the ST. LOUIS CITY TRIBUNE



HE WANTED THOSE EGGS FOR HIS OWN PRIVATE "EASTER PARTY"

ALLEY in the NICHOLS COMMERCIAL APPEAL



HOW DO THEY GET THAT WAY?

SMITH in the BROOKLYN CITIZEN

OF THE WORLD'S DOINGS



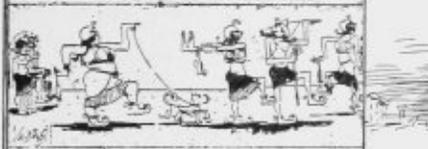
RETRIBUTIONS BEING PAID BY AN ANTI-TRUST PROSECUTOR.



RAVENS, ARIZONS AND JARVIS BRIDGES WASTEFUL TO WORK.



REORGANIZING THE NEW HELLS OF HELL.



PRICE ASKED FOR THE FUGITIVE ALIEN.

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WE MAY AS WELL BE READY FOR IT
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OUR RIGHTS

KELLY
 KELLER 23



BERTHMAN IN THE WASHINGTON STAR

CHARLES KELLY IN THE INDIANAPOLIS NEWS



"LAY, DERN YE, LAY"

HORNES IN THE MOBILE OBSERVER



KEEP 'EM BOOMING

BRECKENRIDGE IN THE ATLANTA JOURNAL



Captain Amundsen's Airplane Is Equipped with Skids for Landing on and Starting from Ice Fields. He Now Has His Ship and Air Equipment in the Arctic, Awaiting Favorable Conditions to Begin His Exploration

PHOTO-MAPPING ARCTIC WASTES BY AIRPLANE

by HENRY WOODHOUSE

President of the Aerial League of America

THE great white expanses that surround the northern and southern extremities of our globe have long been blank spaces—spaces where the geographic features fade into dotted lines or nothingness. Perhaps the trail of some explorer may establish a narrow strip of known territory—a feeble finger reaching toward the pole; but he has chosen the shortest, the quickest and the easiest route with the pole as his main objective and today the great waste spaces are almost as little known, as mysterious and as fascinating as they were a century ago.

Things are changing, however; explorers, with both poles established, are now bending their efforts toward wiping out these blank spaces on the map—the “position doubtfuls” or P. D.’s as they are called. And that they may do their work with the same speed and efficiency that has marked their dashes to the poles, they have taken the speed of the modern airplane and to it coupled the accuracy of the camera to duplicate in the Arctic what is an everyday occurrence in more temperate climates.

There are legions of P. D.’s remaining in the subarctic regions, south of the great Arctic Circle, that will be fit subjects for aerial photography. Even now there are two airplanes in the Arctic awaiting the beginning of polar daylight to start their work. They are part

of the expedition headed by Captain Roald Amundsen on the ship “Maud” icebound somewhere in the great Arctic Ocean.

As soon as the Arctic period of daylight begins, Captain Amundsen’s airplane will rise from Wainwright, Alaska, while the smaller of the two airplanes will rise from the ice near the “Maud,” in the “Arctic graveyard” belt, to survey the Arctic expanse.

Amundsen himself has been busy charting the transpolar route with a view of establishing advance depots to which the airplane can fly, land to replenish its fuel tanks and then take off again for the polar or transpolar flight, whichever he may undertake first. Captain Bartlett made such a map for the Baffin Bay route.

I met Captain Bartlett soon after his return from the McMillan relief expedition, and urged him to make a report on the possible aero landing places that he might discover en route to the North Pole. He did so and gave me a copy.

His report reads as follows:

“I started from St. Johns, Newfoundland, on July 2, 1917, with the S. S. *Nephtune* to go to Etah, about 3,000 miles’ journey by ship. By air line the distance would probably be only about fourteen hundred miles.

“Fortunately the weather conditions on this trip were excellent. They would also have been most favorable for air-

planes, because the atmosphere was clear and the winds were all southerly.

"Practically everywhere from St. John's to Etah there are low foreshores or spits, affording a landing place of hard gravel of from half a mile to two miles in size where airplanes could land. In other places on the frozen sea, there are many flat ice floes affording miles of flat ice on which airplanes can land.

"The airplane equipped with skids will never lack a landing place on the way to Etah—or to the North Pole. Nor will a flying boat fail to find calm water, clear of small pieces of ice.

"The nearest suitable landing place for airplanes to the North Pole that I know of is Cape Aldrich, or Cape Columbia, about 413 miles from the Pole.

"The distance from Etah to Cape Columbia is about two hundred miles by airplane or about 400 miles measuring the distance between the intervening possible landing places for airplanes.

"The Eskimos will not be surprised. We have told them that by and by we would come as the little auk, the loon and other migratory birds do. They believe it and will remind us of that disappointingly if we do not do it soon.

"We showed them pictures of airplanes dropping bombs at the front and they understood. They know what explosives are. Some of them have used dynamite, some have dropped explosives and had their limbs blown off. The effect is common knowledge. So they understood when we showed them photographs.

"From Etah to Cape Columbia landing places may be found on both the Greenland and the Ellesmere land side and on Grand Land. The Cooper Keys, or Cape Columbia Peak, would be a striking landmark on a flight to the North Pole from any other point. It will be a landmark to the future air travelers."

During the return trip of the Pole discovery Bartlett saw Cooper Key peaks, which rise up be-

hind Cape Columbia to a height of twenty-three hundred feet, from almost one hundred miles away.

From Cape Columbia on there is nothing but the big floes, with many flat places with a surface of hardened snow suitable for emergency landings.

It is to be supposed that people flying from Cape Columbia have either the North Pole or Cape Chelyuskin as their objective. If the Pole is their objective they will return to the starting place or to other landing places on Greenland. It is entirely possible that land will be found in the unexplored regions in the Arctic Ocean, in fact, most of the explorers are sure there is land to be found.

With the tremendous strides that have been made in aeronautics it is entirely possible to use airplanes to explore during the good weather periods. The huge airplanes of today could easily fly from Cape Aldrich to the North Pole and back or from Cape Aldrich to Cape Chelyuskin, on the Siberian side.

The airplane will revolutionize exploration. It will be very simple compared with the present method. The radio direction finder, which was so successful in the trans-Atlantic flight, will make possible long flights in the Arctics, removing the danger of getting lost, while aerial photography will make mapping of thousands of miles of Arctic area a matter of a few years. Heretofore it required centuries to find a passageway to the Poles.



Herbert Island, East of Northumberland, Is Typical of the Country That Is to Be Mapped by Means of Aerial Photography

A PIONEER OF POWER

A Personal Sketch of Col. H. M. Byllesby, One of the Foremost Engineers in the Electrical World and the Active Head of a Gigantic Network of Public Utilities, Who, at Sixty-four, Is Still Blazing Trails

by FRANK S. CHAMBERS

FORTY-TWO years ago a couple of 22-year-old fledgelings entered the employ of Thomas Edison—himself a youngster barely ten years their senior. Coming from widely separated spheres and environments with nothing in common but the desire to realize the great vision they dreamed, each was drawn to the young genius by the ambition to work elbow to elbow with him, to help solve the mysteries of science and harness the great power with which he was wrestling. Edison was submerged in intricate problems of developing the incandescent electric lamp, so the two fledgelings dived in head first. And head first they have gone into everything they have undertaken since—head first or brain first.

When they came up for breath Samuel Insull was guiding the personal affairs of Edison, acting first as his secretary and then as his business manager and friend, and young Henry Byllesby was in charge of the engineering problems.

Their first big job was the establishment of the old Pearl Street power plant for the electric lighting of New York City. The two newcomers found their hands full trying to keep step with the genius they had adopted as their leader—Insull endeavoring to keep his chief out of the hands of the physicians and receivers and Byllesby striving to meet the ever-increasing demand for new types of apparatus and machinery that Edison was constantly making upon him.

"I've simply got to make the chief quit twisting his brain with new ideas," confided Insull. "I wish the heavens you would!" heartily agreed Byllesby, thinking of the weird diagrams that were flowing into his office in an endless stream, diagrams that must take the form of machinery or apparatus or special equipment of some sort. So the three young crusaders of science worked together—one inventing and researching, one guiding and directing and one producing and developing.

Almost half a century has passed. All three are still active. Each has reached the pinnacle of his profession. Thomas A. Edison, Samuel Insull and H. M. Byllesby—the three foremost figures in the electrical industry today.

The careers of Edison and Insull have always been part and parcel of one another, but Byllesby—well, Byllesby is a pioneer. He's the sort of worker who must blaze his own trail.

As long as the work of the Edison interests were of a pioneer character, the young engineer was happy. He was creating and designing. He made all the drawings for the structure, cranes, location of boilers, engines and switchboards of the First District Pearl Street Station—a pioneer job, as it was the first steam-operated central station in the United States. Then he designed central stations for construction in Chile and in Montreal. He installed and operated the generating plants for Edison at the Louisville Exposition in 1884 and at the New Orleans Exposition the following year.

By this time the Edison interests were well established and a pioneer organization was formed. So Byllesby turned to it and at the age of 26 was made vice-president and general manager of the Westinghouse Electric Company. Here, surely, was a connection that promised wealth and power and position enough for anyone.

But once a pioneer always a pioneer. The trail-blazing problems his company was meeting in Europe next attracted the attention of H. M. Byllesby. As managing director of the Westinghouse Electric Company Ltd., in London, the young pioneer busied himself for two years. By this time electrical service was well established there and he needs must hunt a new frontier. Byllesby found it in Minnesota.

Meantime, however, he had not forgotten his experience with Edison and

had been very active in the production of new machinery and apparatus, taking out, either in his own name or as an associate inventor, approximately forty patents of various details of electric lighting apparatus and systems.

In spite of all this, the new frontier was calling. There were new trails to blaze, new developments to pioneer. Mr. Byllesby was made president of the Northwest General Electric Company with headquarters in St. Paul. He was also director of the business of the General Electric Company in northern Michigan, northern Wisconsin, Minnesota, North and South Dakota, Montana, Wyoming, Idaho, Washington, and Oregon.

At last he was in his own country—the country of pioneering and of obstacles. He was in a country of unlimited opportunity to a man with vision, for he could develop the wonderful resources that lay at every hand. Gradually there came to him the big idea. Why not harness the idle giant that lay in the rivers of those hills and mountains? Why not put those waters to work generating electricity?

Here was a real vision and a chance for real pioneering. He could see into the future. He could see what this



Col. H. M. Byllesby, Pioneer and Trail Blazer, Active Head of the Company of That Name Which Owns and Operates Public Utilities, Electrical, Hydroelectric and Gas Properties in Over 600 Towns and Cities

would mean for the country. But he could see too far! This time he was too much of a pioneer. Others were not ready for so radical a step. They would not dare enter upon such a job. Things were going nicely now and the future was assured. They had merely to develop slowly now and reap the rewards.

His associates were pioneers. He must realize that. But there was such a thing as getting too radical, of dreaming too grand a dream. Hydroelectric power was practical in the East, where population justified the expense and where the obstacles were not so hazardous, but it

didn't seem so away out in Montana, and the idea of actually running the railroads themselves with electric power—well, that was a little too rough a trail, even for pioneers.

So Byllesby dropped the idea until he could organize his own company. Like his old chief, Edison, the idea of quitting never occurred to this engineer. The more obstacles piled up against him the more stubborn became his fight.

Byllesby believed in the future of hydroelectric development as firmly as Edison believed in the future of the electric light. Under Edison he had learned to "hang on," to cling to his vision. Had he not more than his share of tenacity of purpose he would never have shared the most strenuous ten years of Edison's existence. He had the courage of his conviction, the will to hang on and the force to drive ahead.

So the big, brawny engineer tramped the mountains of Montana with camera and notebook and measuring instruments. From 1894 to 1898 he explored the entire water power situation of Central Montana. On the one hand he saw great visions and dreamed marvelous dreams; on the other he tramped and climbed and measured and fought. During that time he constructed the two initial hydroelectric developments and laid plans for the future Montana Power Company. The first of his plants was built near Butte, the other near Missoula.

Byllesby does not talk about those pioneer days. "It just took a lot of planning and hustling and building" is all the comment he makes on this marvelous pioneer work of his. During this time he learned much about financing—knowledge that was to prove the foundation upon which the world's largest public utilities organization was to be built.

Hard experience had taught Byllesby that successful development must proceed in a logical cycle. First there must be the natural resources. The West had that. Then there must be the idea and the vision. Byllesby had that. Then there must be the engineering ability necessary to accomplish the development. Byllesby also had that. Then there must be the financial resources which, in reality, were stored labor and materials. They must be found, and then protected.

The hardest fight this practical engineer had was to teach the difference between development and exploitation—to protect communities against unscrupulous promoters and against their own ignorance in the use of their own money. No one ever realized better than he the danger of financial backing improperly protected. His problem was not only to get the money, but to see that those who furnished it were protected.

The engineering estimates upon which the financing was based must be accurate and conservative. Otherwise failure would result and the confidence of the community shaken. It would also mean a handicap for the next development.

He was not a promoter. He was a builder and an operator. What he built must work and must earn money. Throughout the whole country were monuments, thousands of them, to the folly of unsound developments. He took over two or three of these in the course of his work, and put them back in the productive class. Then the bankers began to evince an interest. Maybe he could do as much for them—it was possible he might be able to do something with some of their white elephants. If he could revamp and reestablish a plant, it was worth risking a few thousand more on. They simply had to do something to take care of their investors. And that fellow Byllesby could be depended upon. If he said he could make the property pay, he could. And he would know how much it would cost, too.

As this engineer's reputation for rebuilding and revamping run-down, improperly constructed and obsolete public utilities grew, the demand for his services became greater. He could tell, almost at a glance, why a piece of property failed of its purpose. He could estimate, almost to a dollar, the cost of bringing it up to efficiency. Also he could and would tell just when and where a development was misplaced, explaining frankly that it must be abandoned. In other words, they could trust his judgment and his integrity.

As time passed, this pioneer engineer pained in his work of building and reclaiming projects long enough to pick up a development or two for himself. In

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ANALYZING YOUR CHILD'S FUTURE

¶ *Before Many Years Have Passed, We Shall Be Able to Take a Child, Determine Its Strengths, Weaknesses and Tendencies and Tell Definitely What Training and Career Will Suit It Best*

by MARK H. REVELL

DOES Tommy's knack for organizing games and leading teams among his playmates earmark him as a future captain of industry or statesman of international fame? Does Arthur's fondness for books indicate a future as a writer or scholar? Does Robert's tinkering with tools point to a career as an inventor? Because Marion pays rapt attention to all the music she hears, will she become a great musician?

No one needs to be told the need for correct answers to such questions. Our love of children, our hopes for their futures, our knowledge that mistakes in choosing life work and in training for it do irreparable harm to thousands of children every year—all these lend emphasis to such inquiries. And when we see the marvels of science in other fields, when we see electricity and ether harnessed in radio sets, when we hear of scientists weighing and analyzing stars trillions of miles away, we inevitably ask, "Can't science help us with these questions, too? Can't the scientists take this vital matter of child-training out of the realm of guesswork? Can't they give definite principles, so we'll know we're training our children to the best advantage?"

The time has now come when we can answer "yes" to such questions. The answers are not complete yet, nor certain in all their details; but they are valuable answers, usable right now, and unquestionably on the road to the complete an-



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The Little Girl Teaching Her Parrot to Sing May Have Tendencies Which Will Lead Her to a Remarkable Musical Career. Or It May Be the Spirit of Leadership Breaking Out

swer that we want. Before many years have passed, we shall be able to take a child, determine its strengths, weaknesses, and tendencies and tell definitely what training and career will suit it best! The problem is now yielding to the attacks science is making upon it!

There is no better way of seeing how much progress has been made, as well as what remains to be done, than by seeing how science now answers the questions we have asked above. In order to make the survey reasonably complete, let us add to the four children already mentioned—Tommy, the leader, Arthur, the studious, Robert, the tinkerer, and Marion, the musical—two others, whom we shall call Ellen and Harry. Ellen likes parties, excitement, dancing; Harry is a fat, jolly boy, without marked preferences but willing to do whatever the crowd fancies. And what does science tell us about these children?

Tommy, we are told, is of the type that likes to "run things." He has energy and personal magnetism, but he doesn't care

much for books and abstract study. He likes to work through and with companions; achieving results in human activity is his bent. While analysts differ in their use of terms, as common a name as any for his type is that of "dominating" or "dominant."

The sharpest contrast to Tommy is afforded by Arthur, the studious. Physically, he is comparatively inert; his parents are always turning him outdoors "to get some air and work up an appetite." The constant challenge to his mind is, "What is it? Why?" He is interested in *knowing*, not in doing. He is of the "intellectual," or "mental" type.

Contrasted with both is the type found in Harry, the fat, jolly boy. He is of the so-called "vital" type, whose chief interest is in enjoying the so-called "good things" of life—"good things" being limited to experiences which do not trouble his mind too much. He lacks the restless energy, the "driving power" of Tommy, the intense mental curiosity of Arthur. Because he is willing to take what comes and do his part, he is generally liked and gets along well among his fellows.

The remaining three children are classified by some analysts as "mixed types" and by others as additional "pure types." Since the exact division between types does not matter, as we shall see later, we can follow the simpler course and call them pure types, beginning with Robert, the boy who "makes things."

Robert, on our "rough-and-ready" system, belongs to the type which is stirred characteristically by any challenge to do things with hand and brain combined. Mending toys, making kites, repairing bicycles—these are the tasks which bring his interest and efforts into play. Regarding him as a "pure type," we may identify him as "mechanical."

A type of peculiar interest is found in Marion. While various factors underlie her love of music, the chances are that she is of the so-called "emotional" type. She is not interested particularly in doing things, even to the extent that "vital" Harry is; she lacks the keen logical powers and analytic powers of the "intellectual" type. She likes to sit back and enjoy experiences which thrill and stir, which appeal to her emotions directly

without involving physical or mental effort to a great extent.

Ellen, the fun-lover, is a sort of mid-type between Tommy and Harry. She likes activity, as Tommy does; but, like Harry, she directs it toward enjoyment instead of following Tommy's bent for constructive effort. She is impatient with the cares and responsibilities of leadership. She is of the "motor" type.

Thus we have our starting point—a common-sense, definite system of classifying children. To many people, and even to some professional analysts, this seems enough. It seems easy to these people, once the type of child is determined, to pass on to formulating a program for the future, on the principle "like turns to like." "Point the child," they say, "for work that gives the greatest scope to impulses, makes the greatest appeal. Groom Tommy for a business executive, Arthur for the law or science. Robert will succeed as an inventor, engineer, or architect, while Marion has a future in art or music"—and so on.

But a moment's thought will show the weakness in such hasty conclusions. For one thing, the system classifies children in definite groups, with hard-and-fast lines between each group. Common sense tells us this cannot be done. Children are not purely "intellectuals," "motors," and so on. They are only *predominantly* one or the other; it is the rare child which does not exhibit some characteristics of all types. In order, then, to analyze children correctly, we must not pigeonhole them according to one outstanding trait. We must measure every child in each characteristic. It is in this work that science is achieving its great results.

Here is where the psychologist comes in, with refinements upon the rough-and-ready type differences we have described, and with exact tests in place of common-sense judgments based upon everyday acts and preferences. Also he explains the "why" of this character difference, instead of leaving us with the mere fact that it exists, as the common-sense method does. This explanation we shall do well to get in mind, for most of the modern ideas in child training rest upon it.

The explanation turns upon what the psychologist calls "associative tenden-

cies," but which we may explain by comparing the brain to a giant telephone switchboard. On this basis we may say that "incoming calls"—that is, the promptings which lead to action of any sort—as they come from the senses and such inner sources as the imaginations, emotions, and will, are distributed to the mental centers of sensation, memory, judgment and motor action, by connections within the brain. Many of these calls follow the same track in all brains—we all blink, for instance, when a blow is struck at the eyes—but many others go to different centers in different brains. It is this difference in "hook-up," or "associative tendency," psychologists tell us, which underlies difference in character.

Ellen, for instance, and boys and girls like her, are easily understood as children whose brains refer as many "incoming calls" as possible to motor centers. Sensations and ideas of a nonmotor nature—that is, ideas which do not lead to "doing something"—tend merely to diffuse throughout such brains, creating mental uneasiness from which Ellen and her like seek relief in action. We all have this feeling when we grapple with some idea we don't understand. After more or less wrestling with the idea, we become impatient and "chuck it," as the saying is. Then we turn eagerly to something within our likes and capabilities—which is exactly what Ellen and her kind do with abstract questions and problems.

In Arthur, on the other hand, the brain structure tends to refer as many "incoming calls" as possible to the centers of reflective thought. Ideas, therefore, which merely irritate Ellen, find ready ac-



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"Snowballs, Only One Cent," Cried Out the Lad Who Was Selling Shaved Ice Sprinkled with Fruit Juices. Maybe He Will Be a Business Genius or Great Salesman

ceptance in Arthur, because of this difference in "associative tendency." Again, the vital type, seen in Harry, refers incoming calls to centers of receptive enjoyment; and the same explanation applies to the other types.

This viewpoint gives us several improvements upon the rough-and-ready classification already described. For one thing, it suggests methods for testing exactly the characteristics underlying these types. One of the simplest is to present a great array of ideas to a child. From the responses, recorded both as to character and the time taken in making them, determine how the "hook-ups" run in the mind tested. Another valuable feature is the creation of standards. After testing thousands of cases, the psychologists average the results obtained, and then compare given children with these standard figures, as in the case of the Binet-Simon tests for "mental age." Thus, they can say that a given child is "more intellectual" or "less motor," than the average for its age.

The method has even greater value when it comes to planning the child's education and future. It is easy, for instance, once Arthur is classed as "intellectual," and his preferences are found to

(Continued on page 300)



Babies Are Radio Fans, Too. Since the Wireless Fever Hit St. Paul, Minnesota, Hundreds of Kiddies Have Been Badly Bitten by the Radio Bug. It Is a Boon to the Mothers for They Can Slip a Headset on the Youngster, Tune in the Set, and Go About the Housework While the Baby, quiet as a Mouse, Listens to the Music, Kiddies Stories and, etc. It Keeps This Youngster Satisfied for Hours, Says His Mother



These Instruments, Torture Relics from the London Tower, Were Sold at Auction. The Man is wearing the Well Known Scold's Bridle and Carrying the Spiked Collar and Leg Irons Which Were Freely Used on Certain Unfortunates Several Centuries Ago



The Latest Game of Lawn Checkers, Invented by Harry Lutz, of Lake Popatcong, New Jersey, Is a Very Large Checkerboard Manipulated Like the Regular Game Only Long Poles Are Used to Move the Men. Mr. Statler, Noted Hotel Man, Played John Bowman, Millionaire, for the Championship at Alamac, New Jersey, on This Board

Putting the "Pop" into Popular Songs

"Song Hits Are Not Written—They Are Made Popular the Same as Any Brand of Soup or Soap"



by
E. M. WICKES

An "Act Getter" Who Lands the Dolly Sisters Is a Wonder. Betty Gulick (at Piano), World's Youngest Song Writer, Turned the Trick with Her New Ballad Sensation

ANYONE can write a popular song. It's easy. In fact, it's

easier than writing an interesting letter, and there's no logical reason why everyone who has to toil for a livelihood should not want to write a song, because if you can turn out a hit—and it's just as easy to do this as to produce a flivver—you can earn for a few hours' work from five to twenty-five thousand dollars in royalty.

Furthermore, it's easier to write a song now than it was years ago. Before the dance craze took a strangle hold on the public, you had to tell an interesting story in your lyric. You either had to inject a new idea into the lyric or give a new twist to an old theme. But now all you have to do is throw together a set of rhymed lines that won't laugh at one another and manipulate them into a fox-trot rhythm. Your next step is to induce some girl to read the lyric—a girl is always preferable, because more than 90 per cent of popular sheet music is purchased by romantic girls—and have her tell you in two or three words just what impression the lyric left on her mind. Her reply should make a good title.

songs are written by a handful of professional song writers. It's not so. There must be at least a million persons writing songs every year, with another million on the verge of trying.

Most of the manuscripts produced by new writers are submitted to music publishers, but only a few are accepted. Thousands of those unable to find markets for their musical wares publish their own compositions, hoping that the public, after discovering how much superior they are to those issued by the regular publishers, will buy copies until the sales exceed the million mark. It's a beautiful dream which rarely comes true. And if you're keen to learn just how many songs are published and copyrighted every month, you can obtain this information from the U. S. Government, which prints and distributes every month a bulletin carrying the titles of musical compositions copyrighted the preceding month, along with the names and addresses of the author, composer and publisher.

Provided you possess the cash, it's just



Here We Have Billy Jones and Ernest Hare, Phonograph Artists, Who Have Been Lured into a Piano Room to Try Over a New Song for the Phonograph. They Get Little Rest from Publishers and "Pluggers." Occasionally When They Pass Some Publisher's Office and Refuse to Go Up, the "Pluggers" Will Lean Out the Window and Sing the Song to Them

as easy to publish a song as it is to write one. But you can't write or publish a hit at will, because hits are not written—they're made popular the same as any brand of soup or soap. Injecting popularity into a song is somewhat of an art in itself, and nine times out of ten it calls for a big outlay of ingenuity, time, energy and money—especially money.

And yet, all the time, energy, ingenuity and money in the world won't make a hit of any particular song unless it possesses that psychological something which appeals to the public. No one can foretell just what the public will like next in the way of a popular tune. If one possessed this power he could easily earn half a million dollars yearly.

While you have, no doubt, read about writers and publishers making fortunes from songs like "Carolina Sunshine" and "Dardanella," you never read about a publisher dropping a fortune on a song he was confident would become a hit, and which he tried to force on the public—but this happens regularly. Yet, on the other hand, some song that has been rejected as a joke by all the prominent publishers is eventually issued by a small firm and turned into a hit. "Smiles," for instance, which was a tremendous hit in Europe as well as in this country, was scorned by at least a dozen big publishers.

Lee S. Roberts composed the melody of "Smiles" during the closing days of

the war, thinking the soldiers and the public would welcome a cheerful tune with a lyric which refrained from mentioning war. Roberts was managing the affairs of the Q. R. S. Roll Company and had an idea he could sell rolls of "Smiles," even if the sheet music sales didn't amount to anything. So Roberts made a roll of "Smiles" and put it on the market—but it didn't sell. Then Roberts tried to interest some New York publishers in "Smiles," but none could see any value in it.

In addition to "Smiles," Roberts had written and published fourteen other numbers. He decided to continue to publish his own songs and induced The Richmond Music Company of New York to act as his selling agent. Richmond, thinking he might earn something on the strength of Roberts' Q. R. S. connection, worked on the songs for a while and gave them up as hopeless.

Then Jack Robbins appeared on the scene. Robbins, who was about twenty years old, had lost his position with another publisher on the same day he received his draft number. Figuring that he would be called within the next two months, Robbins made no plans for the future, but dropped in to see Richmond and applied for a temporary job. He got one as general utility man.

While rummaging through the stock Robbins came across a copy of "Smiles." It struck him as a happy thought, so he

read the lyric and then forgot about it. Shortly after that he had occasion to visit a Woolworth store and discovered "Smiles" on a counter with other dead songs which were selling three for a nickel. He heard no more of "Smiles" until a few weeks later when an orchestra leader said to him:

"I played 'Smiles' at a hotel grill last night and it got several encores."

Robbins took no stock in the report, figuring that the leader had just happened to have an unusual dancy crowd which would have encored any number. But when another leader told him a similar story Robbins began to think that there might be something in the number and took a dance orchestration of "Smiles" to the orchestra leader of a big Broadway cabaret and asked him to play it. The leader glanced at the title and said:

"I played that piece of junk for Roberts once, and I wouldn't insult the boys by asking them to play it again."

Robbins thought well of that particular leader's opinion at the time and accepted the verdict as final for "Smiles." On the way home Robbins chanced to meet Ban-Joe Wallace, another leader, and jokingly told Wallace what the other leader had said about "Smiles."

"If you want to come up to the hotel with me I'll have the boys play it and let you know what I think about it," Joe said.

Robbins accepted the offer. After he had heard "Smiles" played as a dance number, he went over to Wallace.

"It isn't a bad tune," Wallace remarked.

Robbins knew this was a polite way of saying it was junk and decided he had wasted enough time on "Smiles." He put it out of his mind, but was unable to keep it out for during the following week another leader came to him and said:

"I played 'Smiles' for a dance in New Haven last night and it's the biggest thing I've had in years."

That started Robbins off again. He went to a certain man with a bug for song-writing and said:



Jack Robbins, Who Put Over "Smiles," "Tell Me," and "Yoo Hoo." He's Trying to Get a Ten Thousand Copy Order for His New Hit from the Buyer for a Large Jobbing House

"Bill, if you'll make a record of 'Smiles' for Columbia I think I can get Richmond to publish one of your songs."

Bill promised to make the record and did. But when the record came before the committee for approval it was thrown out as junk—unfit for release. And Richmond on hearing what had happened to the record advised Robbins not to waste any more time on "Smiles."

Robbins followed Richmond's advice for two weeks. Then a vaudeville performer told him that he had heard the dancers at the Claridge Hotel call for "Smiles" every few dances. And the performer added that he was going to feature "Smiles" in his act.

Robbins knew that when the crowd at the Claridge got excited over a number it meant something. So he went to the Claridge and witnessed a repetition of what the performer had told him. Even the leader raved about "Smiles" and said he was going to play it several times every night. Robbins reported the matter to Richmond and got permission to order three thousand dance orchestrations, which he distributed at night among orchestra leaders in New York, Brooklyn, and other near-by cities. Some he mailed to out-of-town leaders.

In less than a month leaders in all parts of the country began to clamor for or-

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A CHAT WITH COUÉ

The "Miracle Man" of France Declares That He Is a Friend of the Physician and Hopes to See the Principles of Autosuggestion Introduced in the Programs of Medical Faculties

by HAZEL MANLEY

"I HAVE no magic powers. Anyone can do it, if he will try and believe that he is getting better and better."

M. Emile Coué fixed his penetrating brown eyes upon me as he spoke. I like his eye. It has much to do with his magnetism. When he speaks, his sharp glance pins his auditor and when he is talking about his formula, his eyes light up brilliantly.

As I chatted with the little chemist from Nancy, whose theory of autosuggestion is being discussed the world over, I noted that his white beard and beaming face recalled my early dream of Santa Claus.

"I'm practicing your doctrine," I said to him. "Believing I could see you, I have been waiting three hours, Dr. Coué." He smiled and corrected me.

"I am not a doctor, just plain monsieur," and his eyes twinkled. "I have no magic powers. I teach the people to cure themselves." His English, while fluent, has the Gallic accent. It is augmented by characteristic shrugs and gestures.

A cup of chocolate was handed him and slowly he sipped it as he talked.

"One eats too much, even when one eats little. I am sixty-six years old. I do more work than most men of thirty. I travel constantly, work all the time, eat everything I want but am never sick." He paused a moment and his face was all aglow as he repeated the slogan that he has given to the world.

"No I am never sick. Every day, in every way, I am growing better and better."

He is extremely shy, this little Frenchman who has been demonstrating the powers of autosuggestion in American cities and who has set the American public to reiterating his famous formula. Fairly stout and below medium height, he wears simple black clothes with no pretense to style and a made-up black tie adorns his shirt front. Old-fashioned round cuffs and a narrow standing collar give him the appearance of the early Victorian era. He believes in comfortable

shoes. His hands are sort of pudgy and his face is cheerful.

"How far will your teaching go in curing disease?" I inquired.

"I don't know," he answered. "It has illimitable powers. The American people," he continued, "they receive me with the plus grand enthusiasm. Everywhere they astonish me. I am not a philosopher but a practical man. I am a teacher. I have never cured anything. I teach people how to cure themselves. I am a teacher only. Mine is not a new idea, non non. St. Paul said the same thing without knowing it. Oh no, I cannot cure broken bones," he said, "but I say '*ça passe, ça passe*' and it helps. Pain is just the consequence of illness. It is the illness that must be cured. It must not be thought that I am substituting autosuggestion for medicine. I consider one the complement to the other and never opposed to each other." His face grew more serious as he talked, while his eyes sparkled with enthusiasm.

"Doctors should not look upon me as an enemy, but as a friend, for my dearest wish is to see the principles of autosuggestion introduced in the programs of medical faculties in order to furnish them with a powerful weapon which will help to fight disease. French doctors who for a long time had shown themselves hostile to my ideas are beginning to adopt them. Just before my departure for America, I had a long conversation with one of the best-known doctors in Paris who adopted completely my theories. He proposed formation of a scientific committee of patronage composed chiefly of famous physicians for the institute which I have just founded at Paris and at which lectures are now being given by Dr. Vachet, Dr. Virot and others."

"Are American medical men interested to any great degree?" I inquired.

"Oh yes," he assured me. "A number of American doctors and clergymen have been to see me at Nancy this year, and after watching the results of my methods

have become converts."

"Tell me please," I said, "if the people who were cured this morning by applying your autosuggestion at Orchestra Hall will remain so unless they continue the practice of your formula?"

He was thoughtful for a moment and then answered.

"They should continue it and should read my book and keep themselves cured."

"Have you cured a broken heart?" I asked. "Oh yes," he told me and laughed merrily when I asked if he had to put his hands on them to cure them.

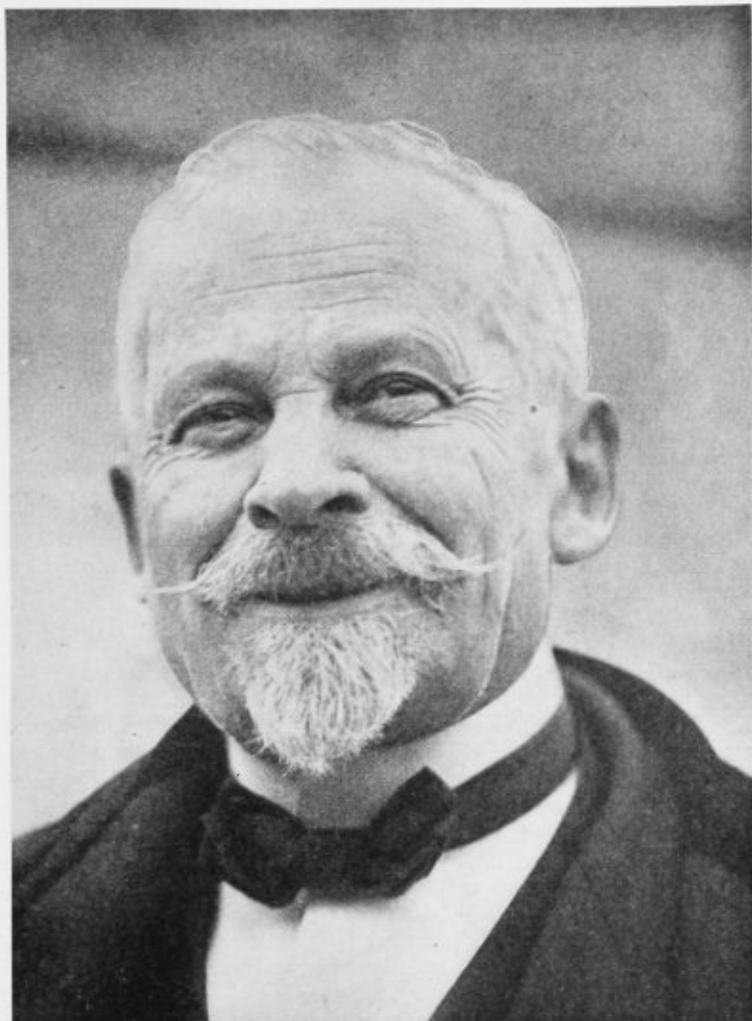
Coué has a sense of humor. I made the discovery by inquiring if many people had come to him to be treated for the drink habit.

"Only one drinker I know," he said, "has wanted to be cured."

Twenty-two years have passed, he explained, since he began substituting autosuggestion for castor oil in his work in Nancy. It all started with his study of hypnotism.

"It occurred to me that some of the hypnotic influence might be applied to the curing of imaginary ailments. So many would not be sick at all if they did not think themselves sick."

He began practicing on customers who seemed in no real need of his drugs and



M. Emile Coué, Whose System of Healing by Autosuggestion Has Aroused Widespread Popular Interest

induced them to say and repeat and keep saying and repeating that they were not ill but were getting better and better. His fame spread rapidly. Patients who had been helped told their neighbors about it and, like all stories of a sensational nature, it spread until pilgrims began coming to Nancy for treatment by the "miracle man." He says that nearly a hundred of them are at his door every day now and they became so numerous twelve years ago that he made up his mind to give up his chemist's business and devote all his time to healing by autosuggestion.

"They come to me from all over the

world," he exclaimed. "I have had visitors from East Africa and Australia and from your America."

"You had a great many from my America this morning and a great many more are standing in the snow on crutches in front of this hotel waiting for you now," I added.

"I want to help them and some are helped and some are cured as the two you saw this morning. But I am not a miracle worker. They must help themselves. I have just a common-sense way of putting the imagination to work."

Americans are the readiest disciples he has found, M. Coué said. In this country he has been received with an enthusiasm of our own eagle-brand kind which has left him short of breath. Next to America comes England, he said.

With boyish delight he handed me sample letters to read.

"Look—see the letter from a stammerer who is now entirely cured! See this one from a paralytic made to walk by his own imagination!"

"How is your formula to be used?" I asked. He finished the chocolate and set the cup aside.

"It is not necessary to be intelligent to apply the treatment of autosuggestion. Some less intelligent do it better. It is not necessary even to believe, to have faith. Pronounce the words 'Every day, and in every way, I am growing better and better' loud enough so you can hear them and do it over and over and over. They will penetrate the unconscious mind. When written into the unconscious mind, you listen without knowing you listen and the tune sinks in and, maybe without knowing what you do, you begin to unite. The words should be repeated mechanically without thinking, over and over. At morning and night is the best time when the mind is more at rest."

"That appeal is to the subconscious mind, to the imagination. It is all in having confidence in your ability to do a thing. He can who thinks he can. There you have a lot of complex theories boiled down. If you consider a thing easy, it becomes so. Don't ever admit to yourself that anything is difficult or impossible. The altruist finds without seeking what the egotist seeks without finding. The

more good you do others, the more good you do yourself."

"If you wish to become a lawyer, you must repeat over and over again 'I will become a great lawyer, I will become a great lawyer' and you will become that. I ask the American public for its calm judgment when I have had ample opportunity to explain my work. The American pace is killing. I am struck with the nervousness on the part of many audiences in the country where I have been speaking. Among the sick people who crowd around me for aid and advice, which alas I am not able to give to all, nine-tenths could trace their troubles to a nervous affliction."

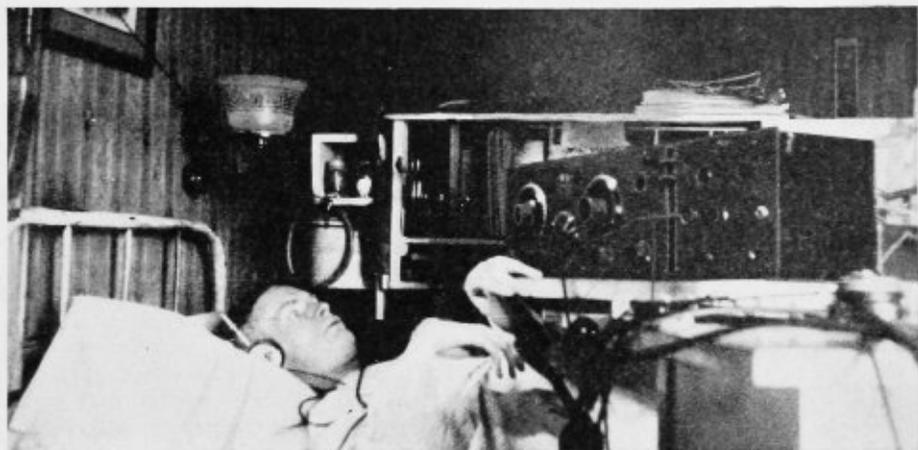
"I do not say," he continued, "that all blind and deaf and paralyzed people are so because they think they are so. But I do say that many of them make themselves so."

He cited the cases of victims of a real paralysis, but whose organic ailment had left them afraid they were still paralyzed. It is these "frightened victims of psychic paralysis" who can cure themselves by autosuggestion, he maintains.

By a subtle method of protection against the scorn of the doubters, Coué gave me an idea of his scorn for those who think if you have your leg cut off, you can imagine it to grow on again. "Such persons," he declares, "are feet for to go to ze insane asylums."

Throughout the "healing process" of O. R. Kroph, during the recent Chicago visit, I noted that the only quiet, calm person in the group was M. Coué. The experiment was prefaced, as were all the others, by the disarming phrase "I don't know what will happen. If you think you are sick and really want to get well, it will succeed. Otherwise, it will not." Coué rubbed the lower limbs of Kroph, repeating over and over again "*ca passe, ca passe*" until his voice blended in a monotone with that of his patient. Then a few staggering steps and Kroph walked along—faster and faster, up and down the stage, while an audience of three thousand people cheered and wept and shouted.

Commenting upon this incident Coué said, "I did not do it. He did it himself. He imagined he could not walk; when he thought he could walk, he could."



Reuben N. Harrison and His Joy-Giving Radio Set Which He Has on His Own Specially Constructed Stand

SUNSHINE FOR THE SHUT-INS

This Man, Confined to His Bed for Seventeen Years and Able Only to Slightly Move His Hands, Gives a Great Message of Cheer to Other Unfortunates.

His Latest Reason for Being Elated Is the Fact That Radio Has "Brought Him Back to an Old World of Interests Which He Thought Were Hopelessly Lost"

by REUBEN N. HARRISON

I AM a bachelor living on a farm in a rather remote country districts in the northern part of Rockingham County in the valley of Virginia. Consequently, my environment, personal interests and opportunities have always been in accord with the plain, simple customs of the average farm and country life.

When fourteen years of age I was taken with an unusual form of progressive chronic rheumatism. That is, the affliction was slight at first, but grew gradually worse until I was what most normally active people would probably consider an absolutely helpless, bedfast cripple. It seemed that way to me, too, at first, but seventeen years' experience as a bed-ridden shut-in has taught me that "Where there is a will, there is a way." Many things are practically possible, even under circumstances and conditions which, ordinarily, may seem overwhelmingly discouraging.

For the last seventeen years I have been confined flat on my back in one un-

changeable position in bed. Barring a miracle or some scientific development or discovery, I must spend the rest of my life in this condition.

I have absolutely no action in any of my joints below the shoulders; my body and lower limbs are straight and inflexible. I cannot sit up, turn on either side or so much as turn my head on the pillow.

I have fairly good use of my left shoulder and wrist and good rotary motion in the left forearm; the fingers of both hands are unusually active and uncommonly well trained. Both elbows and the right wrist and shoulder are absolutely rigid and useless. However, both arms are crooked up, like picked wings, in just about the right position for use on the typewriter, under existing circumstances.

My general health is good. I suffer no pain or other discomfort worth mentioning. I especially enjoy associations with my friends and I am constantly occupied in the pursuit of somewhat modi-



As He Is Not Able to Raise His Head, Mr. Harrison Sees the Writing Done on His Typewriter by Means of a Movable Mirror

fied interests, but practical interests just the same, and I find little time to worry over unavoidable circumstances. I have great fun improving my own circumstances and incidentally reducing the burden of care such a condition must inevitably inflict upon others.

I will not attempt to go into detail in respect to the probable influences and obvious discouraging handicaps incident to the first years of affliction and nerve-racking pain. It is sufficient to say that my youth was spent and what education I have was acquired in bed under the circumstances mentioned. That is not and never can be an ideal existence, of course. I long for the normal existence but I do not pine for it. It is the duty of each and every individual, except in cases of mental incapacity or the prevalence of pain, to develop interests in some vocation and adjust them to the circumstances of environment. It is up to me to make the best of an unfortunate situation. I do not remember how many months I spent

in worry over the final realization of lost opportunities.

When the condition finally became more passive, leaving only the effects of years of pain and agonizing suffering, I came to a consideration of the situation as it was and is. I began to kindle a spark of interest in working out my own problems in accord with the circumstances and practical possibilities.

First I designed my bedside desk or cabinet providing a hinged pigeon-hole file drawer for business papers, letters, and writing material. There is also space for books, magazines, newspapers, drinking water, and various other daily essentials. Everything is within reach and the necessity of a constant attendant is thereby eliminated.

Hinged to the cabinet in convenient position is a swinging arm upon which is mounted, by means of a pivot, my invalid's adjustable reading rack which holds any form of book or other reading matter in comfortable and practical position for reading while lying down. The reading rack requires little strength to operate, holds any form of reading matter perfectly and eliminates the usual eye-strain attributed to reading while lying down. I often read all day long with comfort by means of this rack.

Interchangeable with the reading rack on the hinged arm is my little pivoted typewriter stand, the use of which enables me to use a small portable typewriter. The swinging arm with either reading rack or typewriter in place is arranged to swing into position over the bed in convenient position for use or out of the way when not in use.

In connection with the work on the typewriter I use my adjustable mirror arrangement which enables me to see each word as it appears in writing. The mirror is underslung from an arm which is hinged to the window facing at the head of my bed and is easily placed and fastened in any position or angle before the window or over the bed to get the reflection from any place or object desired. The mirror proper works on a sort of suspended swivel arrangement and is easily operated with the tip of one finger, if one cares to extend possibilities. The mirror is used for making observations outside the window or about the room.

I even use it in taking my meals and various other ways peculiar to the circumstances. Without the mirror my principal line of vision would be straight up; with the mirror I see everything in my room or in view of my window.

This invalid's equipment is my own invention throughout, made to supply my needs, and, I have recently received notice that suitable claims and patent rights will be granted on it in the United States Patent Office. I believe a similar outfit would prove a great comfort in various conditions of age and affliction. With this invalid's equipment I developed practical interests in life and maintained them in accord with circumstances in such a way as to render life altogether worth while.

With active fingers of both hands and only limited use of my left arm, by the aid or use of my own invented outfit, I do lots of work on the typewriter, keep up my interest in inventions and electrical developments in particular and indulge in my full share of reading. This has all been daytime work heretofore and in spite of all I could do the grind would become rather monotonous at times. I continually felt the need and wish for some form of diversion. A year or so ago I began to read about the marvelous radiophone developments and possibilities, but even then it was months before my attention was called to the probability of adapting the radio to my own use.

In February, 1922, I received a letter from my cousin suggesting a radiophone demonstration and entertainment at my bedside. In March the radiophone was temporarily installed in my room and a number of us country folks were treated to the most novel and thrillingly interesting experience of our lives.

As I listened to the news reports, lectures and musical concert broadcasted



He Does Not Require Constant Attention as He Has an Ingenious Movable Cabinet Over His Bed

from Station KDKA of the Westinghouse Company of East Pittsburgh, what had formerly been a spark of interest in radio burst into a roaring flame of enthusiasm.

The realization of the unlimited opportunities and possibilities opened to me was like the discovery of a new world or, more strictly speaking, it was the return to an old world of interests which had been given up as hopelessly lost. I was actually listening to a class of entertainment which I had years ago given up all hope of ever hearing again. Many of the handicaps of physical affliction, distance and community customs and circumstances were overcome. "The mountain had come to Mohammed." It is easily and practically possible for so-called shut-ins even in remote country districts to receive the beneficial influences of educational instruction, practical information and enjoyable diversion of sporting results and musical entertainment. Grand Opera, vaudeville, burlesques, music, which I had long considered inevitable deprivations, due to affliction, were at my ears.

And before that eventful night was past, I was considering ways in which I might be able to operate my own receiving set. When scientists can discover forces and inventors construct devices by which those forces may be put into practical use, most any sort of guy ought to be able to use them.

"Necessity is the mother of invention."

(Continued on page 312)

WHEN the EYES of the MAN-

Within the steel circus-cage that imprisons man and performing wild animals drama thrills every moment—Drama that shifts with sharp crack of whip and sudden springs of beasts. Man is usually the master, but now and then the beast has an inning

by FRANK BRADEN

THERE are more performing wild animals in America today than ever before. Five of the six best-known circuses offer displays of trained jungle beasts, and this fact has drawn the attention of the public to the handling of these animals. Almost everyone knows that even the tamest of these creatures of the wild is ever dangerous to trainers, and, of course, the trainers know it better than anyone else. Yet—

John Helliott, one of the best-known animal men in the world, presents large groups of lions and tigers, as well as mixed groups of leopards, bears, pumas and jaguars. For several years he has refused to use a steel tipped staff in the exhibition arena. Executives and fellow animal men of the circus of which Helliott is head trainer have often urged him to carry this simple defensive weapon when working his big lion act, for in it are four bad black-maned Nubians. Helliott has laughingly refused. "I always know just where that quartet of naughty boys is," he has replied. "I know just what they are doing every minute and exactly what is in their minds. A good trainer has eyes in the back of his head, you know. We old-school animal men rely on the whip. It would be weakness to place a steel tip on my staff—amateurish."

John told this to a group of St. Paul business men one day last January as he was making ready to enter the arena of a winter circus. The St. Paul men, who had become greatly interested in his work, were watching the lions emerge from their cages to stalk through a long runway into the great circular cage in which they were to perform. When the last lion had entered the steel arena, John, with a smiling "See you later, Gentlemen," slipped into the enclosure with his

powerful and magnificently maned beasts. With cracks of his heavy whip he drove them to their pedestals, the four black-maned Nubians roaring their displeasure. But they obeyed.

Federal, the largest and best-tempered animal in the group, was first to accomplish each trick in the act's routine, as usual. The four surly Nubians seemed on the point of an outbreak time and again. As Helliott turned his back to direct other lions through their parts of the performance, one or two of the bad quartet started creeping from the pedestals, seeking a firm footing from which to spring upon the trainer. Laughing, Helliott whirled instantly to drive them back. "By George!" exclaimed one of the visitors, "I believe he has got eyes in the back of his head."

Toward the close of the act, Helliott forced five of his lions, including two of the Nubians, to lie down side by side. Watching the two Nubians carefully, he then lay at ease along the backs of the recumbent beasts, reaching with his hand to pet Federal, who lay at the end of the line. As the trainer raised his hand to lift his hat in acknowledgment of the applause of the audience, he shifted his eyes quickly to make sure that the two surly Nubians remaining on the pedestals were behaving. They were. Federal, tried and true lion, responding to the stroking of John's left hand, turned his great head and nosed gently his trainer's caressing fingers. The audience volleyed its applause. It was tremendously impressed. Here was a marvelous exposition of man's mastery over brutes, and here, too, was an extraordinary and touching manifestation of a lion's love for his trainer. It was a big moment.

Helliott sprang to his feet, driving the lions to their semicircle of high seats, his

KILLER BLAZE

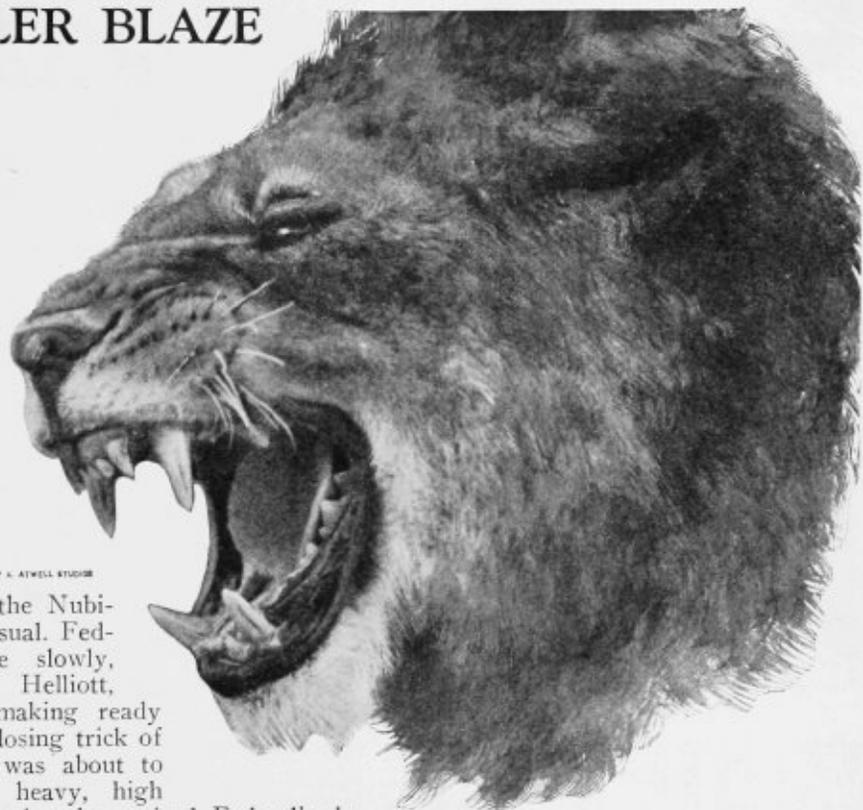


PHOTO BY HARRY A. ATWELL STUDIOS

eyes on the Nubians, as usual. Federal rose slowly, calmly. Helliott, already making ready for the closing trick of the act, was about to move a heavy, high pedestal, when he noticed Federal's delay. "Federal!" he called sharply. In that instant, Federal, oldest and best lion in the group, a lion whose docility and willingness were by-words among trainers, set to spring. Completely surprised, Helliott took a step backward, bumping into the large pedestal, which he had just started to move. Federal, in one mighty leap, pinned his trainer against its sloping side. One claw tore Helliott's face, another his left arm, while the great jaws crunched upon John's left shoulder. The crowd sat stunned, unable to believe what its eyes beheld. Only a few seconds before, this same lion had expressed its affection for the man it now sought to tear to bits. A woman shrieked. Terrified cries filled the auditorium. Bedlam!

In the arena, John Helliott, without the steel-tipped prod that would have saved him had he had it in his hand in the fraction of a second that it took Federal to set for his spring, turned white with pain, but he remained the coolest person in the vast building. Attendants rushed about the exterior of the arena helpless, for

Helliott, the man-killer tearing at his flesh, stood in the exact center of the arena—out of range of their long steel training bars. But John had his whip, and even as Federal's fang-like teeth sank in his shoulder, the trainer realized that the loaded whip butt was all that loomed between him and fatal injury or immediate death. Savagely he beat on Federal's head—with furious blows he struck, vainly trying to reach the beast's tender nose. But it was out of range there on his shoulder where the brute's molars were fastened in his flesh. Then came a terrible sight. Federal gave a twitch of his mighty shoulder muscles, swinging Helliott, whose face was blood-smeared, a scarlet stream dribbling from his useless left hand, to the ground. A deep groan of anguish arose from the stands, while a helper, who had never entered the arena before, lifted the gate pin to step in.

But in that swing to the ground Helliott, still cool, still obsessed by that su-



Time After Time the King of Beasts Will Readily Obey the Trainer's Commands, but One Day He Changes His Mind, and Then—?

preme confidence that real trainers of wild animals hold until the last breath, saw his chance. The lion tore his teeth from John's shoulder to rip at his face, and John landed with the whip butt on the beast's nose. Again he struck. Again. And again. Suddenly, Federal shifted swiftly back into a crouch. Helliott's action in that fleeting second was one of superb hazard. Dropping his whip, lying almost on his back, the man's hand flashed to his side and a revolver spit fire in the lion's face. It was all over. Slowly, resignedly, Federal rose, gaped and moved toward his pedestal. Seating himself with a certain nonchalance, he looked over the audience, which had sunk back into its seats spent with emotion. He shook himself, much after the fashion of a spaniel emerging from the water. "Well, that's that," he seemed to say to the world at large.

Helliott had leaped to his feet, gun in hand. Leaning against the pedestal that had a minute or so before nearly caused his end, he looked about the arena. The four Nubians eyed him warily, as did five other lions. Men stood outside with hand bars at the ready, but they had not been needed. During the enactment of

this jungle revolt not a lion had made a move. The four Nubians had been good sports, for none had stirred a paw to leave its seat. Federal's attack was Federal's business, so far as they and their fellows in the act were concerned.

As for Helliott, he was badly hurt. Two weeks later he left his hospital cot in Cleveland, and, weak from his wounds, put the whole group through its paces before

nine thousand people. He did this against the wishes of the management, but saved the opening performance of his show in so doing. Federal and the four Nubians were almost eager to please that night but, before the trainer entered the big exhibition cage, many old-timers, believing that the lions would sense John's weakness, predicted a general attack. Helliott worked his act without the steel-tipped staff, which is the most reliable defensive weapon animal trainers use. The owner of the show begged him to carry it into the arena, but the trainer's terrific experience at St. Paul and his weakness had not changed his views in the least. "I am the master without it," he said. And that nobody could deny.

With this same circus, which is one of the largest wild-animal exhibitions, was Soudan, a Royal Bengal tiger that rode about the ring inside the steel wild-animal arena on the back of Tessie, a large elephant. Soudan is a magnificent creature, unusually large and powerful, and for three years he had obviously nursed the idea that Tessie, big, placid, good-natured Tessie, feared him. Several times Soudan had started to attack Tes-

sie in the ring, but trainers had driven him off. During these evidences of hostility, Tessie had shown not the least concern, and Soudan remained secure in the belief that he had the big elephant bluffed completely. And there were animal men, too, who believed that the powerful, agile tiger could avoid the elephant's trunk while tearing her into helplessness.

However, all conjecture in the matter was settled at a matinee performance in Milwaukee, for Soudan sprang for the elephant's back, landing behind Tessie's ear. The leap was lightning fast—an orange-and-black flash. Quick as it was, the elephant's trunk struck the tiger as it hit, encircled it, hurled it screaming to the ground, and, as attendants rushed forward with bars, began to kneel on the squirming cat. Tessie was jerked back with elephant hooks and her hold on the tiger loosened or she would have finished the Royal Bengal instantly. As it was, the tiger raced for the open runway and safety. However, Soudan thought it over, apparently concluding that Tessie's win was in the nature of a fluke, for, when the management ordered the act out at the next day's matinee, the tiger, slinking into the arena, where the elephant waited, leaped again. Again Tessie hurled the great, striped cat to the floor and again the animal men rescued it. All doubt as to the elephant's ability to handle a Royal Bengal tiger in combat vanished—in that show, at least. It was two days before the animals performed together in public, and then nothing happened. Soudan had learned his lesson. Tessie and he have worked smoothly and amic-

ably together ever since. They are "good troupers" once more.

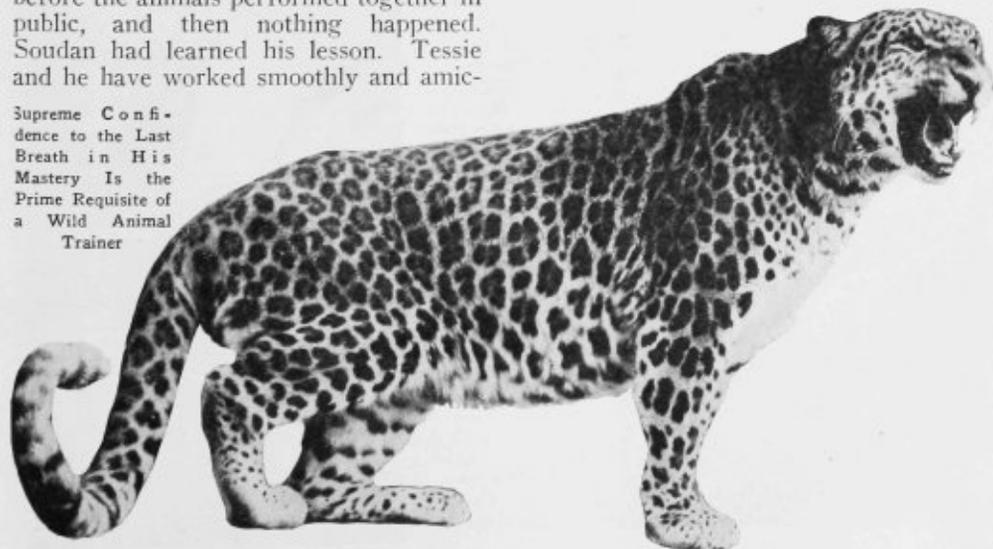
It was Mabel Stark, most famed of women trainers and educator of the renowned Rajah, wrestling tiger, who had the most fearful experience with tigers in the history of the American circus. It was Mabel's custom to ride in the daily street parade of a western wild animal show in the midst of her group of tigers—animals she had performed for several years without mishap. Mabel sat at one end of the den, while the gaudily marked cats paced to and fro about her.

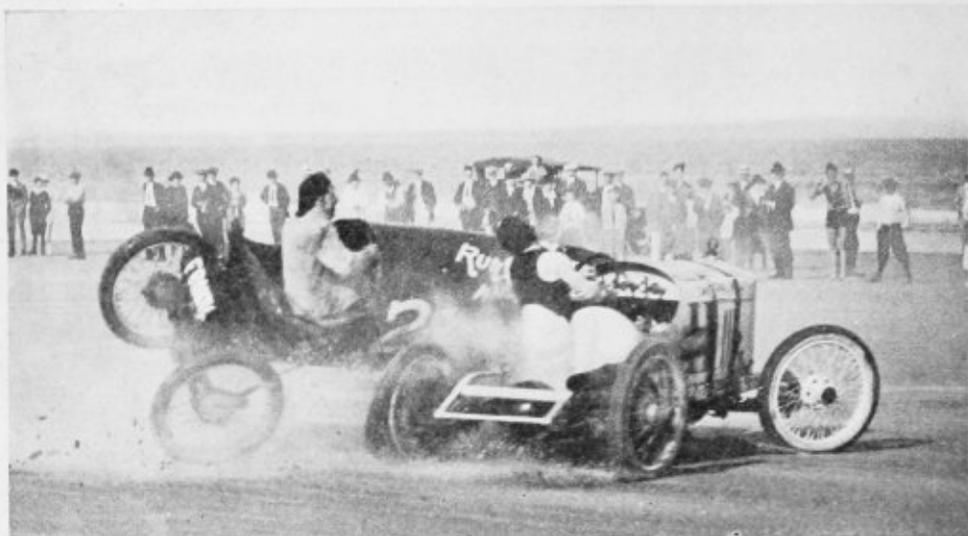
In a northwestern city one spring day a breeze billowed a scarf which Mabel wore and whipped it in the face of one of her tigers. The animal sprang, knocking her upon the floor of the cage and overturning the chair. As she fell underneath the scrambling beast, Miss Stark managed to pull the chair in front of her face. This quick action undoubtedly saved her life, for the tiger ripped her arm open from shoulder to elbow as she grasped the chair. In a second the entire group of tigers was upon her. The crowds along the curbs shrieked their horror, and parade marshals and drivers' helpers rushed to the girl's rescue.

A lithographer with the show, engaged in retrieving bills hung in windows along the parade route, dashed for the cage with the light pole he was using in his work. With this he jabbed fiercely at the

(Continued on page 308)

Supreme Confidence to the Last Breath in His Mastery Is the Prime Requisite of a Wild Animal Trainer





(C) HOSL & HENDEY

Gunnery Sergeant G. F. Charsha of the U. S. Marines Has So Thoroughly Mastered the Mechanism of Machine Guns and Automatic Firearms That He Can, While Blindfolded, Take Several of These Weapons Apart and Put Them Together Again. His Expert Knowledge Has Enabled Him to Qualify as Instructor in Machine Gunnery at Many Marine Corps Posts



This Remarkable Picture, Taken on Daytona Beach, Florida, During the Races Shows Walter Johnson, Well-Known Florida Speed Driver, Colliding with Another Contestant While Attempting the "Barrel Turn." This Is Probably the Most Dangerous Feat Known to Racers. Going at a Speed of 50 to 100 Miles Per Hour, a Sharp Turn Is Made Around a Barrel. Johnson Miraculously Escaped from Death But the Car Was Wrecked



Left—An Extraordinary Flesh-Eating Plant from the East Indies. The Principal Prey of This Peculiar Plant Is Mice That Creep into the Mouth of the Plant, Being Attracted by Its Odor

One of the Principal Troubles of Radio Broadcasting Is Overcome by This "Glowing Discharge" Microphone in Which a Stream of Electric Energy Is Substituted for the Mechanical Diaphragm. Since the Stream Possesses No Perceptible Inertia and Has No Vibration Period of Its Own, It Transmits Sounds Perfectly



New Type Parachute Containers Safeguard Lives of Dirigible Men

UNTIL very recently it has been the practice of lighter-than-air aeronauts to carry their parachutes in dirigibles in a small box container on the bottom of the airship's gondola. This practice, however, is now superseded by the development of a more efficient and better container such as shown in the accompanying illustration.

In all small dirigibles the airmen wear their parachute harnesses and are fastened to their parachute ropes at all times. The old under-the-gondola parachute containers had several disadvantages. Often an airman got tangled with his rope when he went out over the side, and again there was the disadvantage of his having to fall the length of the parachute cord and the full length of the parachute service lines before the parachute would come out of the container in position to open.

With the new containers all this is different. The container is made of fabric-covered aluminum and is formed by two halves similar to the halves of a circular, bivalve sea shell. One of these halves is secured to the side of the gas envelope of the dirigible. The parachute is packed between the two halves and is held in place by the outer shell, which is secured only by a cotton cord. In case of emergency the airman simply jumps overboard. His weight snaps the cotton cord, and away comes the outer half of the container with the parachute attached to it.

The shape of the new container is such that its wind resistance to the progress of the airship is but a fraction of what it was with the old-type box containers under the gondola. Furthermore, the position of the new container on the airship is such that, when the airman jumps, he pulls out his parachute almost the instant he leaves the gondola. He doesn't have to fall the length of the cord before the parachute begins to function. Obviously this makes the use of the parachute practicable when the airship is flying at a lower elevation than would be possible with the old-style containers.



The New Type Parachute Containers Hang on the Side of the Airship Gas Envelope. The Lid Is Supported Only by a Cotton String

With the new containers and an improved saucepan-type of parachute, which is used in connection with them, the airman may depend upon his parachute opening up with a drop of about twenty-five feet after he leaves the ship. This is against one hundred or one hundred fifty feet, which was the average opening space of the former parachutes.

In a series of recent tests conducted at the United States Naval Air Station at North Island, California, Lieutenant "Deadweight" (a sack of sand equivalent to a man's weight) made the jumps. He was thrown out of the ship at varying elevations to test the efficiency of the parachutes and containers. The lowest parachute descent was made with the airship flying only seventy-five feet above the ground, but in spite of this low elevation the parachute opened in about twenty-five feet each time, and the sack of sand settled gently to the earth.



This New Type of One-Room House Has One Large Room, and a Parallel Room of Nearly the Same Size at the Rear, Containing Kitchen and Laundry

CAN WE LIVE IN ONE ROOM?

A Comfortable One-Room House for a Whole Family Has Been Designed by a Pacific Coast Architect of National Reputation

by H. H. DUNN

CAN we live more artistic, more healthful and more comfortable lives in a house which contains one room, than we now live in houses of from five to twenty-five rooms? Bernard Maybeck, designer of the Palace of Fine Arts at the Panama-Pacific International Exposition at San Francisco, who has designed and supervised the construction of scores of public buildings and private homes all up and down the Pacific coast, and who is internationally known as an architect, believes that we can. Out of his many years of experience as an architect, he has designed a one-room house, intended to accommodate families of any number, from two up, and offers rather strong physiological and psychological reasons for the superiority of this type of dwelling. For a number of years, people living in tropical America have developed and built the one-room house; in fact, the Aztecs and the Mayas had such buildings, and the Spaniards adapted them to their own uses.

This design by Mr. Maybeck, however, seems to be the first attempt to utilize deliberately the one-room home as a factor in American housing, its only prior use in the United States having been by the pioneers to save labor and to

economize on materials. Mr. Maybeck designed this unusual house and told of his reasons for working out such a plan. As the mature attempt of a man famous in his field of work to simplify to some degree the complexity of modern life, the idea is well worthy of serious consideration by architects and builders, as well as home-owners. Since the Maybeck idea is to incorporate house and garden into one compact entity called "home," it comprehends the enclosing of the ground in a hedge, or ornamental forestry, to obtain greater privacy, and to equip each home with all the most modern labor-saving devices in the way of electric equipment, so that less space will be required for the actual processes of sustaining life, such as cooking; bathing and washing the family clothes.

"The one-room house," says Mr. Maybeck, "is calculated to make living more natural and healthful by introducing more of the outdoors into daily, or even hourly, existence. It makes for simplicity by putting the money and effort usually scattered over a number of rooms and much furniture into a compact, yet adequate space. It makes for beauty, in a similar way; with less furniture, fewer rooms can be made more attractive and

finer on a given outlay of time, money, effort and space. Imagine the main room, large, and either square or rectangular, or any shape the builder or owner may desire. Take one side or one end; extend this end into an alcove, that might be called a kitchen, or, as they did in the old days, the 'scullery.'

"This extension is the 'stomach' of the house. Equip it electrically with the finest labor-saving devices on the market, an electric stove, electric dish-washer, electric washing machine and ironer, and ventilate it properly. Have your receptacle for refuse on a slide which moves in and out through a wall panel, and you have eliminated the main objection to the kitchen in the house, the disagreeable odors of cooking. With French doors from this alcove leading out to a wide porch, the housewife can move her machines in and out of the house, according to the weather, and do a great deal of her work outdoors.

"The dining table should be of such dimensions and so shod with rubber tired casters that it can be rolled into the alcove for preparation and, when the food is all laid upon it, rolled out again for any meal of the day. On fine days it can be pushed outside on the veranda, which should entirely surround the one-room house. We cannot live too much outdoors for our own physical and mental well-being and one of the greatest

advantages of the one-room house is that it permits so much of life to be spent outdoors."

These French doors, or "ventanas" as the Spaniards call them, are important factors in the one-room house, according to Mr. Maybeck's design, and the plan approximates that of the Japanese house, with its screen walls, which can be thrown open to the extent of leaving little of the house save the roof and floor.

"Take the sleeping problem next," says Mr. Maybeck. "Wall beds can be so constructed that they will open for either indoor or outdoor sleeping, according to weather conditions and the sleeper's desires. Where more than two such beds

are needed, they can be constructed in tiers, not unlike Pullman berths, and curtains used for privacy, or for shelter when the beds are turned outside through pivotal openings in the wall of the house. Old Dutch beds, handsomely carved, could be taken as models, and these wall beds made beautiful ornaments to the house when not in use. Additional wardrobe space could be contrived easily at either end of each bed. Two dressing rooms also occupy one corner of this huge room, and



Bernard Maybeck, of Berkeley, California, One of the Leading Architects of the Pacific Coast, Among a Great Deal of Other Noted Work, Created the Palace of Fine Arts at the Panama-Pacific Exposition, at San Francisco, in 1915, and Has Designed a Number of the Buildings of the University of California

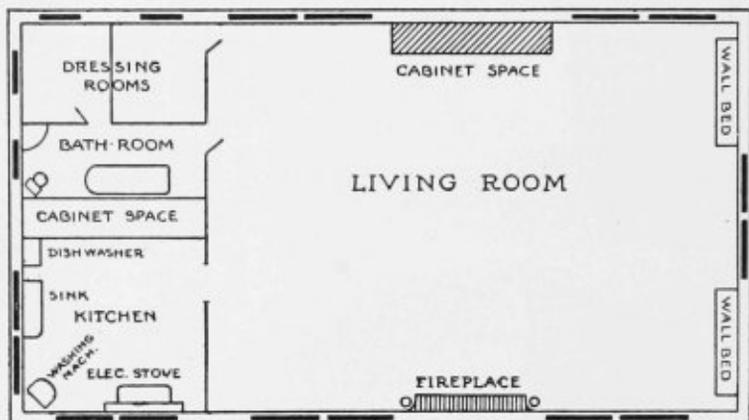
a bath and lavatory is provided, as shown on the diagram. A cabinet space on the opposite long wall will furnish a place for clothing."

The Maybeck plan calls for a fireplace,

since he holds that family life centers about the fireplace, or should be led to center there. On either side of this fireplace are more full-length French doors, the main entrances to the one-room house, though there are six such windows in the plan of the house built for

from the outside; house and garden are equally home to them. Each house, in Mr. Maybeck's opinion, should be snuggled in behind a hedge or miniature grove of trees of some sort. He would have shrubbery so planted that each house seems to be half hidden in a tiny forest

of its own. This would do away with harshness or bareness of outline in many houses, and "would make the architect also a landscape gardener. When that time comes," he continued, "there will no longer be any need for the architect. The city of dreams will rise, clearly and beautifully,



Floor Plan of the One-Room House, Designed to Be Opened to the Light and Air by Seven French Doors and Four Full-Length Windows

two persons, which is shown herewith, so that one may enter or leave this house from any side. These bring the outdoors indoors, according to the Maybeck plan, and his idea is that we need to take life into the outdoors, or bring the outdoors into our lives more than we do. This is one of the main reasons for the one-room house.

"The exterior, like the interior, is a matter of individual taste," Mr. Maybeck went on, "but a one-room house, like a six-room, can be developed successfully in wood, brick, plaster, cement, or any other building material. Wide eaves are most becoming to the one-room house that I have in mind, though they may be skeletonized to permit more light—as wide eaves frequently are in houses in the balmy climate of San Francisco Bay—or built solidly and heavily, the drooping eaves lending a picturesque and individual charm to any dwelling."

An integral part of the one-room house should be the garden, in the designer's opinion. The many doors bring the perfume of the wildwood directly into the house and invite the dwellers out into the garden. Sunshine and fresh air come wandering in freely, and the children of the household scarcely know the inside

the harmonious dwelling-place for a better race, living a better life, more close to nature."

Cormorants Nest in Safety

WITHIN sight of San Diego lie the Coronado Islands, one of nature's biological wonderlands, where nest thousands of cormorants. They need never fear molestation by prowling beasts, for the islands have no water supply. The cliffs and crags are covered with nests of the cormorants and other sea birds.

The cormorant is as large as a chicken. It is not used for food or other purposes by men today.





In Building a Gas Tank Whose Diameter Is 273 Feet, Los Angeles Engineers Used 250 Workmen, Each With a Jack Screw, to Lower the Bottom of the Tank Into Place. At a Signal, the Clang of a Large Gong, the Men turned the Jacks Simultaneously

© LUTYWOOD & UNDERWOOD



"Diamond Charlie" Christi Was Captured in New Haven Recently With Over \$20,000 Worth of Dope in This Traveling Bag. Christi Is the Alleged "Hub Dope King"

These Are the Kensington Park Grounds of London. During the Lunch Hour, Golfers Adjourn to the Spot and Are Taught Golf Technique by Instructors. The First Persons to Arrive Are First to Get Instruction. American Women Who Have Become "Golf Widows" Have Here a Suggestion for Keeping Hubby Nearer Home.



Just Another Stunt to Show They Are Up to the Minute Our West. Walter Nielson Is Diving From a Motorcycle in Mid-Air at Santa Monica

DOES THE WORLD FACE A COTTON FAMINE?

¶ *The Surplus Supply May Be Wiped Out as South Enters Critical Season of Determined Struggle Against Increasingly Destructive Ravages of the Boll Weevil*

by
**LITTELL
McCLUNG**



The Boll Weevil, Probably the Most Destructive Pest Known to Agriculture, Eats Up Cotton and Also the Money That Consumers Pay for Cotton Fabrics

IS a world cotton famine imminent? Is the time here when the supply of cotton, needed daily in civilized living, will fall short and the world go "hungry" for the white staple? Will the present season see the beginning of this famine that may continue for several years?

The answer to these questions is "Yes." For the first time in modern industrial history the world is coming face to face with a genuine shortage of cotton—a cotton famine.

In order to realize what this may mean we have to turn back to England's desperate plight during the Civil War. Getting cotton was the breath of industrial existence to Great Britain in that critical period. Without southern cotton her factories would have fallen into decay and her citizens and subjects been left without many life necessities and comforts. And so rich rewards awaited those who could take cotton through the blockade. The resultant exploits are among the most daring and glorious that have

immortalized adventure on the high seas.

Yet in those days the world measured its cotton needs in tens of thousands of bales. Now it must have continuously hundreds of thousands of bales. At that time cotton met the simpler needs—underwear, bed covering, etc. Now cotton is used in a thousand and one ways never dreamed of in the Civil War period. In these times cotton touches us all every day of our lives; it affects the purse strings of every family.

The world depends upon the South for its surplus cotton—that supply which is the margin between famine and plenty. This margin is narrow—perhaps not more than two or three million bales. The destructive needs of the World War ate into it fearfully and it may be wiped out during the coming season.

No other part of the world offers the slightest practical hope. Increasing the world's cotton production is not an effort of a few seasons; it must be a development covering many, many years. Great Britain's plans to grow her own cotton in her colonies will amount to very little in this generation and maybe not a great deal in the next. Successful cotton growing on a great scale depends primarily upon a genuinely warm climate, plenty of land, abundance of farm labor. Wheat, corn, oats and the other grains can be grown, to some extent, almost anywhere in a moderate climate. Not so with cotton. It is a child of the sun. It must

have his warmest smiles. And from them it unfolds its fiber of immaculate whiteness, almost literally woven from rays of light.

Egypt has marvelous cotton land; it yields a bale to the acre. But it is limited; quite limited. In India and China the climate is favorable and there is plenty of labor but there is no surplus land. So dense is the population of each country that most of the arable soil must be given over to intensive food production, or the people will starve. Australia enjoys the climate and has the land for vast cotton production. But it does not possess the necessary labor, and will not in a long time to come.

Somewhat similar conditions prevail in South America. The Sudan and British Africa offer immense sections suited to cotton growing and they have unlimited labor potentialities in the black natives. But they are without farming implements, ginning machinery or railroads. They are almost devoid of the tools of production and egress to market. It will cost millions on tens of millions of dollars and many weary years of effort before these regions can supply very much cotton to the consuming world.

And so, as it has been for decades, the civilized nations in which cotton is a necessary part of existence and progress, must look to the Southern States for a cotton surplus—those several million bales that are vital. The South alone can avert the threatened cotton famine. If it cannot succeed, then this famine is close at hand.

If this were 1913 or 1914, the South could turn the great trick. It could give the world, at a moderate price, all the cotton it needs. It could enlarge the acreage

planted to cotton, increase yields per acre, and make up the shortage that has been stealing up on the consumer since the latter part of the World War.

But there is a wide gulf between the South of today and the South of ten years ago. Cotton growing in the southern states has fallen on evil days; frightful devastation is over nearly all the millions of acres of cotton lands. Its proportions are unequaled and exceed in loss any natural destruction of wealth and production in the age-old history of agriculture.

In the twenty years previous to 1915 ten cotton crops averaged close to two hundred pounds of lint to the acre. Several exceeded two hundred pounds. Since then this average has not been approached. In 1914, 36,830,000 acres in cotton yielded more than 16,000,000 bales; or nearly 210 pounds to the acre. In 1922 nearly 34,000,000 acres gave less than 10,000,000 bales; or slightly less than 142 pounds per acre. This was the lowest acre-yield in half a century except that of the previous year, 1921, when acre production dropped to record depths—less than 125 pounds.

Losses from this fearful deterioration have run into hundreds of millions of dollars. And hundreds of millions have been added to what consumers have had



The Seemingly Magic Effects of Calcium Arsenate. The Field on the Left Was Dusted with the Poison and That on the Right Was Not Treated. The Piles of Cotton in the Foreground Were Picked from Plots of Equal Size, the Larger Pile Coming, of Course, from the Treated Field While the Smaller Came from a Field Left Untreated

to pay for all cotton goods of every description. And this devastation has not decreased. On the contrary, it is only now coming into full force and bringing the world close to a long-feared cotton famine. The causes are:

1. Loss of labor.
2. High prices for fertilizers.
3. The boll weevil.

The third is the worst, but all three are closely correlated. Boll weevil infestation necessitates additional fertilizing, and high prices for phosphoric acid and nitrates make their increased use almost an impossibility. Boll weevil destruction also demands continued cultivation. For this there must be adequate labor. And this labor is not available. The outbreak of the war in Europe knocked the spots out of Southern cotton field labor. The good, simple, dependable sort of negroes went North by thousands for high wages. Many returned later but with ruinous taste for factory pay and hours. Rapid industrial expansion in the South since the war is completing the job of farm labor depletion. It is literally true that an entirely new generation of negroes will have to come on in the South before balanced labor conditions are restored.

Simultaneously with labor scarce and fertilizers sky-high, the boll weevil has spread over nearly the entire Cotton Belt. The plagues of Pharaoh were a mild visitation compared to this pest. In all the history of agriculture there has been nothing like it for continuous destruction of a life necessity. The insect entered Texas from Mexico about twenty years ago. Since its arrival it has spread north and east until today hardly more than fifteen per cent of the South's cotton growing territory remains uninfested.

Every imagined or dreamed-of method of checking the ravages of this pest has been tried. The first genuine promise of success came in 1908 following careful, earnest experiments in Louisiana by Wilmon Newell and G. D. Smith. These men, in the U. S. Department of Agriculture, showed that powdered lead arsenate would poison weevils without damaging plant or staple. This work, although not commercially adopted, led to continued patient experimentation by B. R. Coad and other entomologists of the Government. Practical, large-scale suc-

cess was not achieved until 1918. After this the Department of Agriculture announced that at last the boll weevil had met its match—in calcium arsenate dusted at intervals and under specific conditions over cotton plants.

This announcement, eagerly expected, was received with intense appreciation by the entire South. It was hailed as one of man's most significant triumphs over a natural foe. And so it was. Since then it has proved out in thousands of experimental and practical tests. Calcium arsenate, of prescribed strength, dusted over cotton fields with due regard to weather conditions, will destroy enough insects to save a good crop of cotton. It is a proved success—after everything else failed.

Yet this significant triumph is being reversed into bitter disappointment. The "economic factor" threatens to nullify discovery, experiment and commercial effort in the fields. Tremendous, widespread demand for the poison has brought about a scarcity and has shot up the price. In addition, the most recent tariff schedules carry a duty on it so that the supply from abroad is curtailed. Under such conditions the increased yields of cotton from the use of calcium arsenate may not pay for the poison, dusting machines and necessary labor. They will not except on especially good land or in fields that have been well fertilized. And fertilizer prices prevent fertilizing in sufficient quantities. At the opening of the new season there is not enough calcium arsenate in this country to treat properly one acre in ten.

Continued farm labor shortage, well-nigh prohibitive rates on fertilizers, scarcity of and high prices for calcium arsenate, the on-sweeping boll weevil depredations—these have brought the world to the verge of a cotton famine. And this year may see the beginning of it. If it comes it will be with us for a number of years. Even if it should be narrowly averted, still higher prices are a certainty for all fabrics and articles of which cotton is a part. The shortage will tug at the purse of every family in America and every half-way civilized household in Europe, South America and the Orient.

When this article appears, cotton plant-



Dusting Calcium Arsenate Over a Field of Young Cotton Plants. This poison Conquers the Boll Weevil. The South Could Defeat the Enemy If Calcium Arsenate Could Be Obtained in Sufficient Quantities at a Reasonable Price

ing will be in full swing over the Belt. Never has there been such an intense effort to raise as large a crop as is humanly possible under the most adverse conditions ever known. The Southern farmer, like his brothers in the North and West, is mortgaged to the hilt to the farm-loan agencies. He is under additional mortgage to the fertilizer interests. He is "in deeper" than he has ever been. But he knows that the world's cotton surplus is about gone. His one hope of lifting some of his burden of debt is in raising a fair crop. To this task he is bending his back.

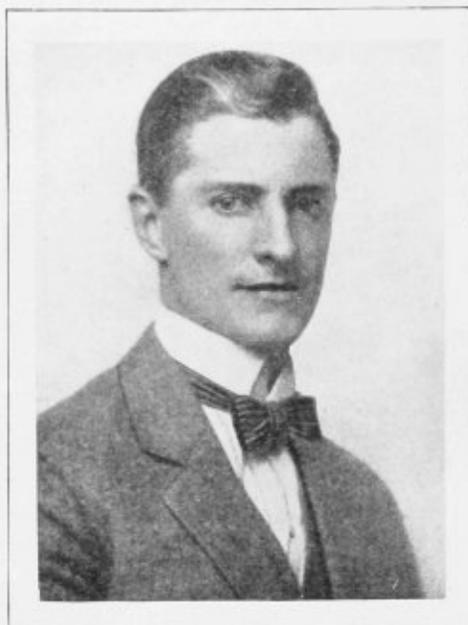
Never will such nervous, intense interest have been drawn to a cotton crop as that which will follow every development of the making of the crop now being planted. Day by day it will be watched by financiers, spinners, manufacturers and large consumers throughout this country, Great Britain and Europe. Every day of sunshine and every rain that falls will be noted and its possible effect forecast. Before the crop is ginned it should be known definitely if the threatened famine has been postponed. If so, then it will only be a question of "When?" Can the following season's production shove it ahead still another year? The shortage is already on. There is no possibility of making it up within several seasons.

Every effort is being made to increase the acreage over last season. Credit margins are being strained to the limit for fertilizers and calcium arsenate. The land utilized may possibly be increased by two or three million acres. But this may not result in crop increase. In fact, additional acreage may actually curtail the total yield because of inability to cultivate properly under present labor conditions. With the boll weevil in the fields, ten acres will sometimes produce more cotton than fifteen acres because the ten can be cultivated more thoroughly than the larger plot.

The entire tremendous effort to avert a world shortage will fail or succeed because of the weather. If the coming summer is reasonably dry, the farmers will have a chance to raise a crop of fair size. They may, by frequent cultivation and using what calcium arsenate they can get, raise eleven or twelve million bales. For the time being this may meet the world's increasing needs.

But if the season is wet, boll-weevil depredations will be terrific—greater than ever known because of the additional territory infested. A wet season, with consequent weevil multiplication, can curtail individual production from twenty to nearly fifty per cent. The wee-

(Continued on page 302)



HE GOT THE ONLY PICTURE

That Was Ever Taken of the Malay Jungle Dwarfs

G. Carveth Wells, a young Englishman, was one of four engineers to make exploration surveys for a railroad from Singapore to Bangkok, Siam. He was engaged in this undertaking for six years, and during much of that time he lived in the primitive jungle like a native. This gave him an opportunity to learn things about the people and their customs and to make discoveries about the jungle and the strange people who inhabit it, that cannot be picked up by tourists who visit the seacoast towns. As a result of his discoveries, Mr. Wells was recently made a Fellow of the Royal Geographical Society of England, which is the highest honor that can be given an explorer. Mr. Wells is now a popular lecturer in the United States.

IT is strange how little is known of the Malaysia peninsula. It is a marvelous country filled with infinite variety. It is inhabited by mysterious people whose origin appears to be unknown. Although their land is a part of the main lands of India, they have little in common with the native races of that country. Nominally governed by Great Britain, they have retained their age-old customs. It is still a region of peacocks, pirates, pythons, elephants and tigers. There are no seasons—no winter, no summer—just the same unvarying temperature day after day. The land is a tumbled mass of mountains intersected by a perfect maze of rivers, the whole region being covered with a luxuriant jungle, which provides homes for a greater variety of birds, animals, insects and wild people than any other region in the world.

For six years I lived in the depths of this jungle making exploration surveys for roads and railways, sometimes losing sight of the sun for nine months at a stretch. The foliage overhead was so densely interwoven that the rays of the sun could not reach the ground. It was a decidedly unpleasant experience to

by G. CARVETH WELLS, F. R. G. S. suddenly feel the blazing sun after living in a dense shade for months. My face was burned with the blistering heat and soon became as red as a lobster.

Many a time I had seen Gunung Tahan, "The Forbidden Mountain," the highest peak on the peninsula, which reaches an altitude of 8,000 feet, and wondered why it should be forbidden to me. I wanted to visit the mountain and get a view of the dwarfs who live on its slopes. There are said to be about twenty thousand of these little people. After being taken into captivity they soon die. My desire was to see them in their native state if possible. While undoubtedly of human origin they are but little above the level of an ape in intelligence. They live on lizards, snakes, rats and roots, and go absolutely naked the year around. When a baby is born it is carried in a sling made of bark which is hung around the mother's neck. Their only weapon is a blowpipe through which they shoot poison darts in their hunting expeditions. They do not live in houses or huts but sleep on the ground and never in the same place twice. It is their custom to build a fire and cover their bodies with ashes to keep warm. They

have not learned that fire can be used for cooking food.

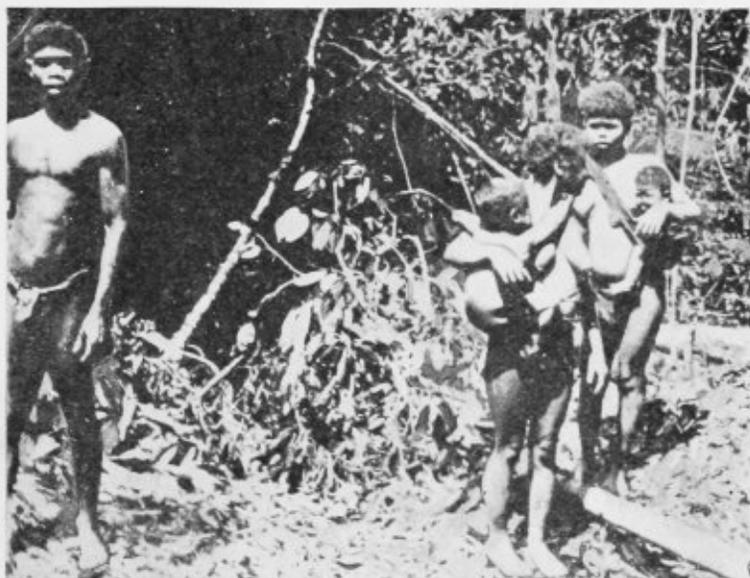
It is very singular that in this part of the world there exists the lowest order of human life, and the highest type of ape. A number of years ago Du Bois, a Frenchman, found the remains of an animal on the island of Java that was midway between an orang-utan and a Malay dwarf. Knowing these things, it was but natural for me to have a desire to visit the Forbidden Mountain in search of a possible missing link. Whenever I talked to my coolie headman about undertaking such a journey, he would always exclaim in his native language: "Don't do it sir, there are lots of ghosts and food is scarce!"

However, I decided to take the trip at all hazards, and in a few days had organized an expedition. My party consisted of eleven coolies headed by old Mandor Hussain, upon whom I could rely in any emergency. We started from the

little village of Tembeling on the Pahang river at six o'clock in the morning, the time the sun rises every day in the year. Our outfit consisted of two large boats and one small mail boat loaded with provisions. The boats were pushed up stream by poles, and by catching hold of vines and branches. We planned to go as far as possible by water and then fight our way through the jungle.

The river was fairly low, and the banks were concealed by the overhanging trees. For two hours, as we slowly advanced, the jungle resounded with the mournful cries of monkeys shivering in the treetops while waiting for the sun to dry the heavy dew in their fur. Gradually the

sounds changed, and as the sun mounted higher the predominating noises were the buzzing of the big black boring beetles, the tapping of woodpeckers, and the cooing of doves and small green pigeons. Now and then a kingfisher would flash across the surface of the water, like a glittering jewel of green, blue and pink. The warm air made me drowsy and I dropped off to sleep, but I was not allowed to slumber undisturbed. The crack of a rifle awakened me, and on looking from beneath the sunshade of my boat I saw a little brown boy dive



Here Is Mr. Wells' Picture of the Malay Jungle Dwarfs in Their Native Haunts. It Is the Only One of Its Kind in Existence

from a tree into the river, seize a fish and carry it to the bank.

We landed and I had a talk with the boy. He explained that his method of fishing was to sit in a tree, throw bait into the water and shoot the biggest fish. When I examined his rifle, I discovered it was stamped "Tower of London, 1800." The gunpowder used was homemade and of a gray color.

On finding that I spoke the Malay language, the boy invited me to his kampong where he produced a whiskey bottle. In the bottle was a little fish about one and one-half inches long. It looked like a stickleback. My young friend disappeared for a little while but



"The First Time I Really Saw the Sky in Nine Months, My Hair Was Rather Short Because It Was Very Much Like the Roof of the House—All Kinds of Things Took Up Their Abode There. I was Quite Pale When I Came into the Sunlight, but Within Two Hours I Was as Red as a Lobster"

soon returned with another boy, carrying a bottle, which also contained a small fish. The bottles were placed side by side on a table, and as soon as they touched the fish began to nibble at each other through the glass. By this time quite a crowd had assembled, and betting on the fish began. They were about to have a fish fight, which is one of the chief sports among the Malays, and each contestant had its backers. The fish were then put into one bottle. They began fighting and soon the water was filled with flying scales. In a short time one of them was killed, and sank to the bottom of the bottle.

Before returning to our boats, a large Berok monkey was brought from under one of the Malay houses. At an order from its master, the monkey climbed a cocoanut tree and in obedience to my command in Malay threw down a green nut. The nut yielded three glasses of delicious, clear water, sweet and faintly flavored with cocoanut.

We then returned to the river and started upstream after the other boats. Noon had passed and thunder could be

heard in the distance. Towards evening large pieces of foam began to come down stream followed by logs and all kinds of rubbish. Within two hours the river had risen nearly eight feet. Poling the boats became impossible so they kept close to the river banks, and the coolies dragged the boats along by means of vines and overhanging branches trailing in the water. Suddenly shouts were heard from the boats ahead and I noticed the Malays jump into the river, including the steersman, who was unable to swim and who kept himself afloat by hanging to the drifting boat with one arm thrown over the side. As the boat floated past, we secured it and then learned the reason for the sudden bathing picnic. In pulling at the branches, the coolies had disturbed a large black water snake which flopped into the boat and commenced writhing madly in the bilge water. After several unsuccessful attempts to climb the slippery side of the boat the snake saw the steersman's arm, wriggled up it and out into the river. The snake was probably as badly scared as the men.

At six o'clock we landed and made camp for the night. The tops of the boats were removed and carried up on the bank, while my waterproof tent was pitched inside a Malay house to act as a protection from the innumerable reptiles, rats, scorpions, centipedes and spiders, not to mention thousands of cockroaches, who lived in the roof. I did not get much sleep that night. In addition to the chorus of jungle noises, I was disturbed by a man in the village on the opposite side of the river, who made the night hideous by "dog howling," as the natives call it. No other words could better describe a Malay Mohammedan saying his prayers when he fancies his voice is beautiful.

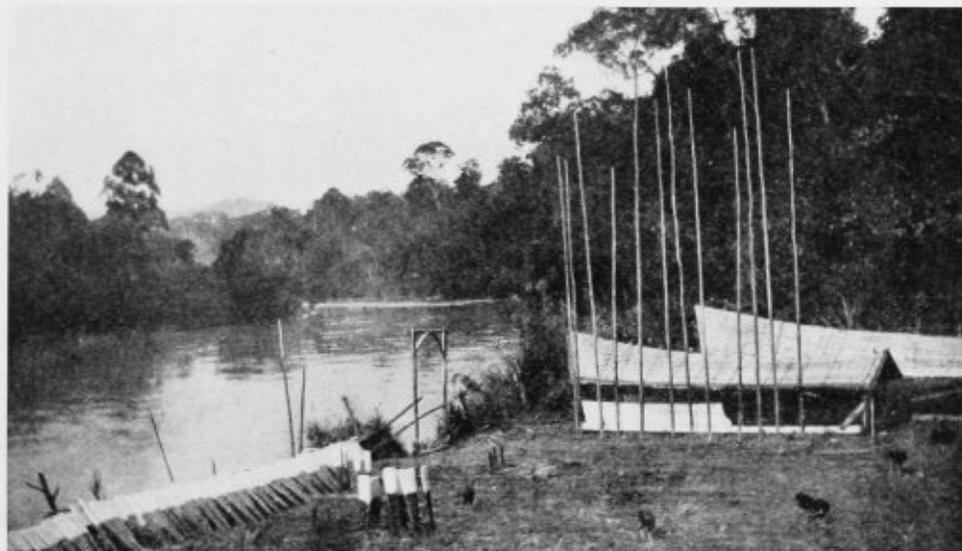
We got off early the next morning, and for two days we poled up stream, and eventually reached the junction of the Pahang and the Tanum rivers, where we camped at Kuala Tanum.

Close to my camp was the residence of a well-known Malay Rajah, called Wan Chik, who together with his brother Wan Lela ruled the district. From them information was obtained concerning the country between camp and the mountain, which by this time was

quite obscured by the intervening jungle. Few people have a correct idea of what a jungle looks like. In these immense tropical forests the decay of vegetation during countless ages has enriched the soil and from it has sprung a most marvelous tangle of vegetation. Huge trees, shrubs, bushes, underwood, thorns, creepers, climbing plants and trailing vines all struggle one with another to reach the light. The trees rarely have lateral branches. They shoot up straight

greens and an annual rainfall of 150 to 250 inches, it is not surprising that Nature produces a jungle instead of an ordinary forest in that part of the world.

My friend, the Rajah, proved to be a very courteous gentleman, from whom I obtained valuable information relative to the best method of getting in touch with the jungle dwarfs who are numerous in the vicinity of Gunong Tahan. The Rajah referred to them as "orang-utan," literally, jungle men. This should



"About Six-Thirty in the Evening (That Is the Time the Sun Sets All the Year Round in Malay) We Would Carry the Tops of the Boats on to the River Bed, Cut Down the Bushes to Make a Camping Place for the Night and Let the Chickens Out for Exercise. They Can Be Seen Walking Around. I Had Chicken Three Times a Day for Six Years. The Stakes in the Foreground Were Used for Marking the Railway. They were Painted White and Branded with Numbers. Within Six Months Some of Them Were Six Feet High with Branches and Leaves All Over. Others Had Completely Disappeared Except for Hollow Shells of White Paint Still in the Shape of the Peg. White Ants Had Eaten All the Wood"

and smooth for a hundred feet before branching out into large cabbage-like tops. Ferns, mosses, orchids and countless parasitic plants cover the trees. Immense rope-like vines pass from tree to tree, up and down, some of them six hundred feet long, binding the jungle into a big tangle.

I happened to be engaged upon the sinking of a number of wells in the jungle in order to make foundations for bridges, and in one instance the well cut through 120 feet of decaying vegetable matter and was impeded at that depth by some half decomposed logs. Combined with a constant shade temperature of 82 degrees, sun temperature up to 160 de-

not be confused with the ape of Borneo, which in that country is called the "mias." To the Malays the word orang-utan means a negrito.

Greatly to my satisfaction, I discovered that Wan Chik had considerable dealings with the little jungle people and that there were one or two of them in captivity. In fact, I actually saw one about four feet seven inches in height poling a heavy boat up stream, containing seven Malays all in their best clothes. He was doing the work usually performed by two or more Malays. By great good fortune, I secured as a new coolie an old Malay who professed to speak a few words of the Negrito language. On one occasion,

I overheard him talking with one of the dwarf slaves and the words sounded like a jumble of clicks that had no connection whatever. The name of this old Malay was Mat Noh, and he requested a contract to build a series of camps in the direction of Gunong Tahan. On condition that he use jungle dwarfs for cutting down the trees, the contract was given him. My plan was to surprise

them at work one day and secure the coveted photographs which I had hoped to obtain. The scheme did not work, however, because no matter how careful I was or how long I lay concealed watching the half-finished camps there was never a sign of a dwarf. I would return at frequent intervals

to find each time the camp deserted but always a little bit nearer completion. Then it was that I realized that I myself was being carefully observed by the dwarfs themselves. Sometimes I would discover where these little people had slept, just a lair on the ground with the branches twisted to form a rude protection from the dew.

Nearly three weeks were spent in traveling up the rapids of the Tanum River. I well remember one evening at sunset watching about a hundred monkeys standing in the river on a beach, turning over the big stones, catching and eating shrimps. Malay monkeys seem to have a distinct taste for fish. On the east coast there is a certain kind of monkey that lives almost entirely upon crabs.

At length we dragged the boats up on the bank of the river and left them there, deciding to continue our journey on foot. My guide, Mat Noh, led the way, then I came with my coolies following behind

carrying my equipment and food. Mat Noh was useful in front as a protection against snakes. It is not generally known that about 20,000 people die from snake bite annually in India. I made Mat Noh go in front so that if anybody got bitten, he would be the one! The jungle here was very old and the trees were immense. Fortunately the undergrowth was not so dense as in a younger

jungle, so that I could often wander through it with the help of a parang, which is a big knife, cutting a branch or two here and there.

On one of my wanderings I stopped instinctively, for within six inches of my face a small green snake was swinging back and forth ready to strike.

I was so surprised and shocked that I did nothing but stare at the snake. Shortly, much to my relief the snake disappeared silently and mysteriously, and so cleverly did it blend with the surrounding foliage that I was not able to trace it.

The coolies were following an old elephant track which must have been used for centuries. In places the elephants' big toe nails had cut ditches in the ground over four feet deep, and just wide enough to permit passage of the animals. Unfortunately the tracks literally swarmed with land leeches, which are the bane of a jungle man's life. They are as big as a match before they bite you, but they become as big as cigars afterwards. Nothing would keep them out. They crawled through the eyelets of my boots, up my clothes and down my neck. Some of the larger ones became so attached to me that they decided to suck blood through my clothes, which proved to be a very messy business, be-



After the Day's Work Was Done, the Engineers Put on Their Evening Clothes. Wells Is the Third Man from the Left. Against All Warnings and Superstitions of the Natives, He Undertook a Perilous Expedition to Forbidden Mountain in Search of a Possible Missing Link. His Experiences Are Told in This Article

HOW CONGRESS CAN VOTE QUICKLY

A New Balloting System Does a Great Deal Toward Speeding Up Legislation

by DAVIS GERRY

AFTER eight years of experimentation and research Marshall F. Thompson has perfected an electrical voting machine which is now being tested out at the National Capitol. The device promises to save much valuable

legislators. It is so arranged that four switch buttons can be installed at the seat of each member of the House of Representatives. Each congressman will have a key to unlock the apparatus at his seat. The device is constructed in such a way



The Small Model of the Mechanical Balloting System Shows How the Big One Works. When a Congressman Presses the Button at His Seat, His Vote Is Registered and Shown by the Machine

time of our federal legislators. It will abolish the old political weapon, the roll call, which those addicted to filibustering have long used as a means of delaying important legislative measures. Records kept over a period of many years show that the House of Representatives wastes about one-third of its time in roll calls and oral voting. During a recent session of Congress the House roll was called six hundred times. Ninety days were consumed in roll calls. This cost Uncle Sam several million dollars for the time that his congressmen wasted, and impeded the posthaste passage of important national laws that were in the making.

The new electrical voting machine conserves the valuable time of our federal

that only one person can use it. If he wishes to vote "Yes" on a certain measure, he presses the "Aye" button. He punches the "Nay" button for a negative vote. There is a third button which when pushed registers the member as present. In case one of the legislators makes a mistake on a vote, there is a fourth button which permits him to change his vote as he desires. The buttons are interlocking so that when one is operated, the others are locked automatically. The correction switch is the only one that will permit of operating any of these after a vote has been registered by a representative.

A large tabulating or record board is a novel feature of the voting machine. It

will be installed in the House of Representatives close to the speaker's desk and will contain the names of the four hundred thirty-five members in alphabetical order. After each name are three small electric lamps. The red lamp lights automatically when the member presses the "Aye" button at his desk and signifies that he votes "Yes" on the measure before the House for consideration. A green light indicates a negative vote, while the white light shows that the member is present. All the legislators can vote simultaneously and the different lamp records of their votes are recorded visually on the novel scoreboard arrangement until the various voting switches are again released. A member coming in late can glance at the tabulating board and note how his party leaders and associates voted. An outstanding feature of the new system is that a representative can hurry over to the Capitol, vote on a certain proposed law and return to his office or committee meeting in a very few minutes. The mechanical ballot box saves much of the time wasted under the balloting system now in use which features the vexatious roll calls and time-consuming oral votes.

One of the ingenious contrivances in the electrical voting method is an automatic recorder cabinet which punches accurate records in tabulating cards, showing how each man voted on the measure, how many members voted and the total number of absentees. The apparatus works something like an adding machine except that all the operations are automatic. As soon as the last member presses his switch button and registers his vote, the operator in charge of the voting machine inserts a tabulating card and turns a lever in the top of the equipment. A number of rapid clicks indicate that the mechanical brains of the remarkable contraption are at work and almost instantaneously the report card is delivered from the machine. It is an exact duplicate on a small scale of the bulletin on the tabulating or indicator board near the speaker's desk. It bears the names of all the congressmen in alphabetical order and shows how they voted. It also gives the total number of representatives that voted. A complete vote of the entire membership of the House of

Representatives can be made with the electrical ballot box in a shorter period than it would take the clerk of the House to call the names of the representatives that begin with the letter "A" in the oral roll-call system. Furthermore, all printed and clerical mistakes are avoided.

Strange to say this extraordinary voting machine, the first of its kind to be perfected and adapted for the countrywide use of our national and state legislatures, is the invention of a young man who has just passed his twenty-fifth birthday. Marshall F. Thompson received his inspiration to investigate the possibilities of devising a successful appliance of this type from the late "Champ" Clark of Missouri, a former speaker of the House of Representatives. Mr. Clark was a champion of speedy legislation and he always chafed under the inefficient roll-call system of voting. When he met young Thompson, who was then but a high-school boy seventeen years of age, the famous Missourian told the boy that a wonderful opportunity for fame and fortune lay ahead of him if he could perfect a worth-while and practical system of electrical voting. The boy was particularly talented mechanically and devoted all his spare time to amateur experimentation. Several months after he met Mr. Clark, he came to the Capitol one day with a clever set of drawings of a proposed electrical balloting method which he had devised. The system looked so good on paper that Mr. Clark and other eminent congressional leaders urged the young inventor to build a demonstration model of the outfit.

One year later, young Thompson returned to the Capitol with a model of a voting machine which elicited frank commendation and approval from hundreds of congressmen. Their sentiments were to the effect that the system should be accepted and installed immediately. Marshall Thompson, however, was opposed to such a program. He believed that he could vastly improve the equipment and he did not wish to present it officially before Congress until it was as nearly perfect as he could make it. As a result, he devoted the next seven years—deducting several which he spent in military service during the war—to the perfecting of his electrical ballot box.

Not until the outfit was letter perfect would Thompson exhibit it to the members of the House of Representatives. The machine has now been improved to a point where it satisfies the requirements of every test and exigency. A small working model of the system is now on display in the House Office Building at Washington and the indications are that the congressmen will shortly take official action to sanction the permanent use of this new method of voting.

The only opponents to the electrical voting system are those congressmen who specialize in filibustering and delaying action on important legislative matters by the incessant demands for quorums and roll calls. There being a minority of these belligerents the prospects are that the new method of voting will be accepted and installed over their protests. As soon as the system is ratified by Uncle Sam, the inventor plans to make a tour of all the state capitols in order to exhibit his new voting device and, if possible, to secure orders for its official adoption by the various lawmaking bodies. At present, the state legislature of Wisconsin is using a makeshift system of mechanical balloting which features the automatic counting of the votes. This method is decidedly elementary and is in no respect a competitor of the improved Thompson apparatus.

On the average about one-third of the working days of our federal legislators are now occupied in unprofitable roll calls. It costs Uncle Sam several million dollars extra annually because oral votes have to be taken. Experts have shown statistically that, on some occasions, practically an entire extra session of Congress has been necessary because certain members have used frequent roll calls as effective weapons in delaying congressional activities and handicapping highly essential legislation.

Generally speaking, it costs the U. S. Government about six thousand dollars for a single roll call in the House of

Representatives as reflected in the actual time diverted from profitable activities for the official counting of heads. A dozen unnecessary roll calls a day represent heavy extravagance and in themselves are sufficient to win public approval of the electrical voting system which speeds up lawmaking and takes much of

BILL No. _____		SUMMARY				
		AYE	PRESENT	NAY	NOT VOTING	TOTAL
DATE _____		0	5	0	3	8

RECORD CARD							
NAME	AYE	PRESENT	NOT VOTING	NAME	AYE	PRESENT	NOT VOTING
ANDERSON		●		ELDRIDGE		●	
BANCROFT		●		FRANKLIN			●
CARDWELL		●		GARRISON			●
DAVIDSON		●		HARDESTY			●

A Sample of Record Card Used with New Voting System. Four Hundred and Thirty-five Votes Can Be Registered Simultaneously

the inertia and lost motion out of Congress.

Device to Spread Sand Evenly on Seed Beds

A **HOMEMADE** outfit for spreading sand on a seed bed has been devised by the United States Forest Service. It consists of a series of cleats, with a hopper at the top for receiving the sand. The entire mechanism is mounted on wheels for pulling by hand. As the contrivance is propelled over the seed bed, sand is fed into the cleats from the hopper and they insure its even distribution.

The arrangement, although adaptable to varying uses, is particularly applicable at nurseries where the federal government is growing baby trees to repopulate a diminishing growth of woodlands. At the Bessey Nursery of the Nebraska national forest, where the sand spreader is in use, more than two million pine seedlings were produced in 1920. Once the tree seeds have been planted, a uniform layer of soil is desirable for the entire nursery. The spreader, just the width of the bed, supplies this need. To date, between five and six thousand acres of the sand hills of Nebraska have been reforested by artificial methods.

GIVING THE GEYSERS A JOB

by ROBERT MORGAN



Geysers on the Slope of Mount Lassen, California, Where Preparations Are Being Made for the Conversion of the Natural Steam into Power

FOR the first time in the history of the New World, the subterranean heat of the globe is being made to yield its energy to man in the form of power. As the culmination of nearly ten years of experiment by one man in an effort to find a means to tap the geysers of the West, a steam engine is now delivering approximately

1500 horsepower with the steam furnished by the natural vents in Geyser Canyon, Sonoma County, California. Volcanic heat has been used for the generation of steam in Italy, and natural gases have been used directly in internal combustion engines, and indirectly as fuel for steam engines elsewhere, but never before has the earth

been tapped and the steam so obtained applied directly to the cylinder of the engine for power purposes.

The force generated by the steam engine now operating in Geyser Canyon, and into which the steam was turned January 25, 1923, is being used to drill other holes to tap other geysers in the same canyon and rob them of their steam. The method followed in taking the steam from the geysers, which here are numerous, large and deep, consists in driving a hole at an angle of about 60 degrees, from a point about a hundred feet from the mouth of the steam vent, into the throat of the geyser, two hundred to four hundred feet beneath the surface. This hole is drilled with a rotary drill, automatically oiled to keep it from burning out, and is followed closely with a two-inch pipe fed in from the surface and jointed at frequent intervals.

When the drill and the pipe penetrate the throat of the geyser, the steam confined therein immediately seeks the shorter and smoother route of the pipe



The First Power Taken from a Geyser. The Photograph shows the Steam Engine Developing 1500 Horsepower from Natural Vents in Geyser Canyon

line to the surface, rather than the rougher, winding natural vent. At the surface the pipe line is capped, after the drill rods and drill have been withdrawn, and an inch pipe let into the cap, with a safety-valve and an exhaust, to relieve the pressure when the engine is not consuming the steam. This inch pipe carries the steam to the engine, which is located as close as possible to the surface end of the pipe line.

Various methods of extracting the steam from the geyser, some of them very complicated and costly, were tried by John D. Grant, of Healdsburg, California, before he tried the driving of the pipe at an angle into the throat of the geyser. During the drilling of the holes into the other geysers, which is now proceeding with power furnished by the first of these vents to be tapped, the plan of dropping a soft concrete-plug into the natural vent of each geyser, after it has been tapped, will be tried, in the belief that it will increase the pressure of the steam. If this fails, superheating at the engine end of the pipe line will be tried, and the steam pipe line will be run inside another and larger pipe line, through which boiling water from the adjacent hot springs will be kept flowing.

Even if no more than the 1500 horsepower now being taken from the first geyser is obtained from each of the vents, it is estimated that this group of geysers will deliver, when all are tapped, from 1,250,000 to 1,500,000 horsepower. The project as at present formulated calls for the ultimate delivery of all the steam collected from the geysers in this canyon to a power house built over or near them, where it will be turned into turbines and converted into electric energy, at a cost even lower than that at which hydroelectric power can be produced under present arrangements. Engineers estimate that that there is enough power capable of being taken from these geysers to supply all the towns and cities within a radius of two hundred miles with power at approximately one-third of its present cost to them.

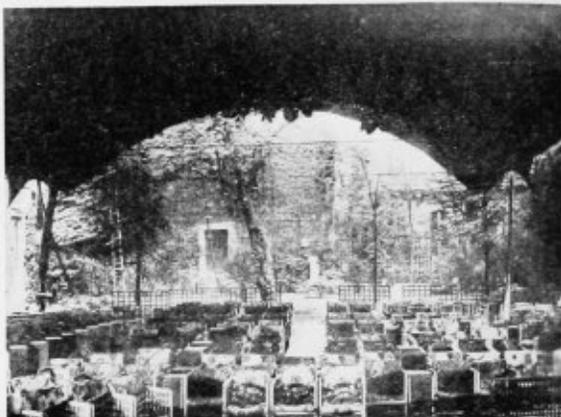
There are large geysers in other parts of California, notably a numerous group at the foot of Mount Lassen, and in the crater of that volcano. Plans have been laid for the development of power from



Will the One-Minute Geyser and All the Others of Yellowstone Park Be Harnessed for Their Prodigious Power?

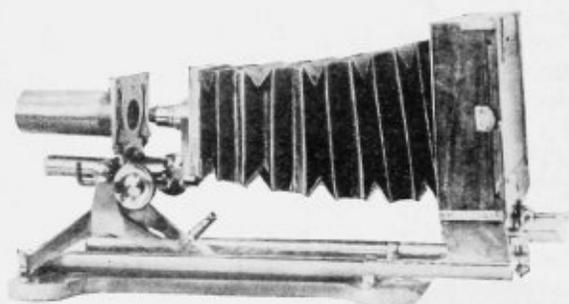
these. There is also a considerable group, with a large output of steam, at the base of Mount Helena, near Calistoga. Much of the success of the tapping of the geysers, however, depends upon the character of the soil and rock foundations encountered and the depth to which borings have to be made. If it is necessary to drill so deep that melting heat is encountered, it is impossible to tap the geysers by the present method, owing to the burning off of the lower end of the pipe line. In this case, the concrete piping with which experiments are now being made, may prove to be the solution.

The success of this venture will undoubtedly inspire the undertaking of others. And, in turn, the wider installation of power plants of this class will lead to the exploration of further fields for the harnessing of the prodigious energy of natural forces. With the proper means for utilizing the ever-escaping energies manifesting themselves as the earth's motional wonders, there is no reason why coupling of their impressive beauty with constructive power should not be effected.

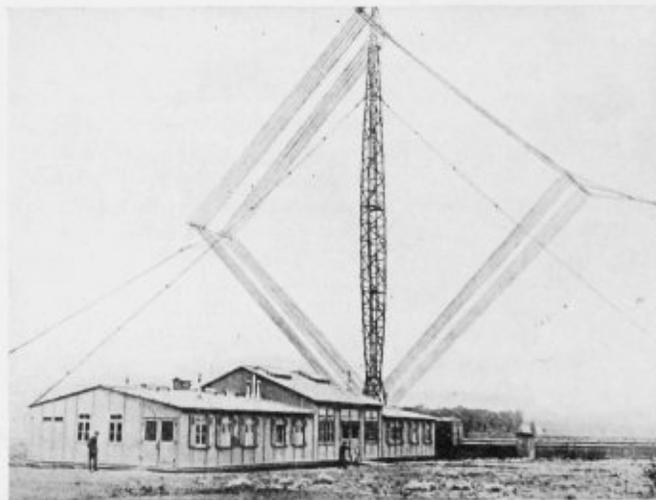


This Pneumatic Roof Was Designed by Paul Poiret, Noted Fashion Creator. The Roof Is Made of Rubber and Can Be Inflated Like an Automobile Tire. In Fine Weather It Is Taken Down but in Rainy Weather Is Immediately Pumped into Place. The Theatre Is Called the Oasis

A New Invention Enables One To Use Higher Magnification Than Is Usually Employed With the Regular Microscope. The Outfit Is Used in Bacteriology



The Center of the Wireless System of Germany Is at Oranienburgerstrasse. The Station Is Powerful Enough to Transmit Messages Almost Around the World



Here Are Flappers for the Flapper, a Novelty for Swimmers Which Enables Them To Travel Much Faster Through the Water

IS THERE SAFETY IN DANGER?

Strange as it May Seem, Historical and Biographical Records Indicate That Dare-devils Generally Escape All the Perils of Their Profession Only to Suffer Injury In Some Unexpected Way While Off Duty

by GEORGE L. HOTCHKISS

ROMANTIC writers, with the heroes of the Trojan war for their subjects, would have ended their stories all in glory; everyone would have come home safely and become a king, and lived happily ever afterward. But Homer was no romancer. He knew that human fate does not work that way. He knew that, having survived all the terrible dangers of that greatest battlefield in history, fate would ironically make them suffer in some little neglected way. Thus, he does not hesitate to tell that one of the great Greek heroes who had

fought and escaped all wounds against even a god died as the result of a slip in a wrestling match, while another committed suicide because in the division of spoils he did not receive what he had set his heart upon; another was shipwrecked during a calm after having passed through a terrible storm safely.

Agamemnon, the general-in-chief of the Greek army, after having survived the perils of war and of the sea, was killed in his own house as he arrived home. In this extraordinary way the heroes of the Trojan war were played with by fate. In the history of the greatest Greek hero of all, Hercules, the same element is shown. He escaped all the terrible dangers in-

involved in the famous twelve labors which included going down into Hell and kidnapping its terrible watchdog, yet after

surmounting all these dangers, he died through a potion given him by his wife who hoped in that way to retain his love.

In modern times, the same curious kinks of fate as described by Homer can be illustrated. We have had our heroes who, after terrible campaigns, have suffered accident and injury from trivial mishaps in their own homes, great adventurers and explorers who, after passing safely through the most startling

perils and experiences, fell victim to some trifling chance. Only recently the remarkable aviator, Sir Herbert Ross, one of the greatest who had won laurels in thrilling aerial encounters in the great war and who had made many records in dangerous distance flights, on making a small trial spin lost his life.

A short time ago, it was thought that Mount Everest would at last be conquered. An expedition of intrepid explorers had reached the highest points that had ever been attained. They did not succeed but they won the highest laurels in mountain climbing. To do so they escaped terrible storms and blizzards and an avalanche that buried seven of



© UNDERWOOD & UNDERWOOD
At Two Hundred Feet Above the Street with the Thermometer at Five Degrees Below Zero Alfons Kurtzo Does This Stunt Without a Quiver. Will a Trifling Thing Injure Him Some Day in a Drawing Room?



Does Some Unspectacular, Unthrilling Whim of Fate Await Harry Piels Who Has Done Dozens of Dangerous Stunts Like This?

their Tibetan assistants. Nothing, in fact, happened to them. They took a rest and went to a sunny city in India prepared to give themselves a good time after their adventures on the Death Peak as it was called. And here one of the party became desperately ill of a cold, not caught on freezing Mount Everest but in the warmth of the city.

During the recent Chilean earthquake and tidal wave at Coquimbo there were many pitiable casualties; but the most extraordinary was that which overtook one named Juan Valdes. He had miraculously escaped both the earthquake and the huge tidal wave; on coming back to his home, which apparently was sound after the tidal wave had subsided, he was buried by the ceiling which suddenly fell in.

But the people in whose lives this curious quirk of fate is most startlingly illustrated are those whose profession requires them continually to take great risks of life and limb, the dare-devils of the movies and those engaged in thrilling

exhibition work. Here this startling fact of human existence is clearly revealed. Among these people the saying is, "If you want to be safe become a dare-devil." And they always remember that Steve Brodie, years after he jumped off the Brooklyn Bridge, died in bed unmaimed by any of his exploits. Perhaps it is this that gives them the self-assurance to go about their work so intrepidly.

At a recent party Houdini and his wife were among the guests. At one point Houdini, of course, obliged by giving some of his hair-raising stunts, with danger enough to make anybody's heart beat. After it was over he happened to walk away for a moment. When Mrs. Houdini noticed his absence she became anxious. She asked everybody whether they had seen him. When he was finally discovered in another room, calmly taking a rest in the depths of a big arm chair, she explained her agitation. She declared that Houdini was the most helpless man imaginable. He was always getting trifling injuries through falls, through getting a finger jammed in a door, through injuring himself with a cigar clipper.

She had to watch him continually lest he hurt himself and incapacitate himself for his work.

Harry Piels, whose daring exploits have electrified Europe, has had extraordinary adventures of a similar kind. Piels is a man who nonchalantly drops from bridges and piers, goes sky-walking along edges of tall buildings, steps carelessly out of an automobile screaming along at a rate of about sixty an hour onto a train going at the same speed, and other similar "jobs."

Recently, he has had two unexpected thrills. One, from which he escaped unharmed, was "all in the day's work"; the other, which cost him pain and considerable trouble, was not. The first happened when the wires supporting a bridge over which he was to ride on horseback before it fell snapped—hurling him and his horse into a chasm many feet below. The other happened in his own house at a party. It was his first accident. While pouring out some tea for guests the glass split; the scalding liquid spattered over

his hand; he jumped back, violently sweeping the glass fragments to the floor, tripped over a chair, fell and cut his hands badly on the glass.

Our own premier dare-devil Rodman Law, whose greatest stunt, perhaps, that of being shot out of the mouth of a cannon has never been duplicated, missed accident or injury in every one of the thrilling exploits that are marked down to his credit. But the white plague got him.

Because huge audiences love to see beauty in danger and escaping unharmed there has developed a great body of girls whose duty it is to take great leaps and dives and all kinds of consequent chances with their lives.

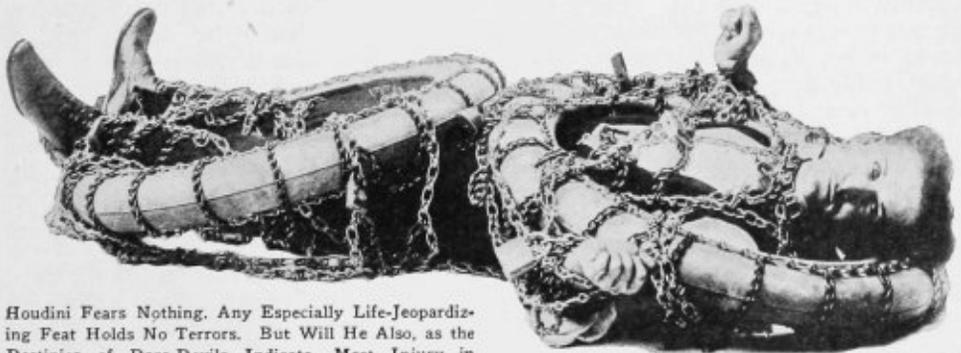
What most of these girls do besides their thrilling stunts is to double for the great stars when the scenario requires dangerous acting. When the audience gasps as some popular film favorite is shown in terrible distress, it is not their heroine imperilled, but one of these strong-hearted girls who is doubling for her. So skillfully is this piece of movie "business" done that rarely does anybody in the audience know that the substitution has been made. Without these brave little dare-devils the movies would be minus most of their thrillingest thrills, as few of the real Queens of the Silver Screen would take the chances.

many mountain lakes in the Fall, would be so cold that it would cause a fainting spell.

The director who had to have his picture, ordered her to go through with the scene; and to show that she was not timid she consented. The bear was of course not a wild Grizzly, as he was supposed to be. He was a genial, good-natured bear borrowed temporarily from the zoo, but made wild by a bit of bear hooch-honey. Then having acquired a taste for it, honey was smeared all over the back of little Miss Virginia, and the bear, following the scent, appeared to be chasing her with utmost ferocity.

The path led to the lake. Virginia plunged in, shivered a bit and kept up her circulation by strenuously thrashing about. But poor Mr. Bruin, once he felt the icy water in his fur, was paralyzed with the cold and went down. Whereupon Miss Wolf went in again with a rope, slung it around the bear's neck and the company hauled him to safety. Miss Wolf, after this, severely hurt herself in a fall down some steps.

Mae O'Laughlin is another one of this daring sisterhood. Her specialty is leaping from bridges and piers. It might seem that to people used to this there would be no danger, but the fact is that danger lurks in this more than in most



Houdini Fears Nothing. Any Especially Life-Jeopardizing Feat Holds No Terrors. But Will He Also, as the Destinies of Dare-Devils Indicate, Meet Injury in Some Common, Prosaic Manner?

One of these girls, Victoria Wolf, has the unique distinction of saving the life of a bear. It happened in this fashion; she was supposed to be chased by a wild bear in the mountains and to be driven into a lake. The weather was very cold and the young lady protested to the director telling him that probably the water, as in

other stunts. For divers practically never know for sure the depth of the water and what is underneath. Sometimes there are heaps of submerged driftwood; sometimes the tide has silted up the bottom at that point; at any rate it is considered the biggest risk in the stunt game, and an il-

(Continued on page 298)

DO YOU WANT TO WRITE?

An Intimate Glimpse Into Journalism

by WILLIAM FLEMING FRENCH

THERE is a saying in the profession which those with ambitions to write might well ponder. It is: "Millions want to write; hundreds of thousands do write; a few hundred *can* write."

This may seem an exaggeration, but plain figures tell us that of every thousand who attempt to "get into print" less than two hundred are successful in that respect; that of those two hundred less than one hundred actually earn money writing; that of those who earn money writing less than thirty are able to support themselves through the efforts of their pens; that of those who do support themselves entirely by writing less than five can be considered even modestly successful, and of that five only 10 per cent will be really successful. In other words, it takes a net of two thousand starts to produce one successful writer.

Such a "mortality" is not encouraging to the hopeful, prospective author; nor are the comments, warnings, advices and "hints" of experienced scribes exactly tuned to a pitch of welcoming cheer. In short, those in "the game" do not encourage others to enter it. And it is, in truth, a profession that demands the maximum in application, originality, persistence, study and inspiration and, except in rare cases, returns the minimum in material rewards. The same degree of efficiency in almost any other calling carries at least double the financial returns, and in many other lines of work triple or quadruple those returns.

That is one reason why professional writers do not encourage beginners to make writing their life work. There are other reasons: For one thing, they realize that the lure of seeing one's name in print and the romance and fame that seem to have woven themselves into the fabric of story-telling fascinate the imaginative, the romantic and the ambitious and early start them taking notes and planning plots. They know, too, that the only equipment one needs to start in this profession is a pencil and a block of paper,

plus a little imagination. Because of this, every year thousands of beginners plunge into the sea of literature without the slightest preparation, with no foundation upon which to build and without any conception of the technique or mechanics of the profession. In the majority of cases they do not even know what branch of writing they wish to follow. As a matter of fact, many of them do not know that there are several different branches of this profession to choose from and that the different branches vary greatly. They think writing is writing and that's all.

But the most universal reason why experienced writers do not freely encourage beginners is because they know, only too well, that on account of the number of entries, because of the rough, winding trail ahead and due to the lack of mapped routes and proper supervision, the novice will need a stout heart and a strong will to make even appreciable progress, and that if a plain statement of facts will discourage him he has not even the remotest chance for success.

So the old theory that every prospective writer should be discouraged is based on the idea that it is wise to make one ford a creek before he attempts to swim a torrent. In short, if a knowledge of the obstacles ahead will make you drop your idea of becoming a writer, the quicker you get that knowledge the better it will be for you. Especially is this true in the case of those who strive for success in this line without proper direction and supervision—and until recently such direction and supervision was not obtainable.

During the last decade, however, the colleges of the United States have developed schools of journalism and correspondence schools and private institutions have added this course to their curriculum. This, naturally, has decreased the "mortality," or percentage of failures, in the ranks of the amateur scribes. However, fully 90 per cent of those entering



A Foursome of Successful Writers. From Left to Right They are Samuel G. Blythe, Who Makes Politics Plain to All Who Read American Magazines; Hugh Wiley, Who Created "Wildcat"; Harry Leon Wilson, Best Known for "Ruggles of Red Gap", and George Ade Who Is Famous for His "Fables in Slang"

the writing game are not in a position to attend a school of journalism or literature and must depend upon their own efforts and the help they may be able to secure from correspondence schools.

In the past, writing has been a gamble, nothing less. The novice writer, be he young or old, started writing and sending his product to the editors. Ninety-nine times out of a hundred the child of his brain came back, accompanied by a neat and efficient little rejection slip. Just why it came back he could not tell. The manuscript was "unavailable for our publication" but this "does not mean that it may not find ready market elsewhere." These were kind words, but they didn't say anything, and the novice writer stood just where he did when he sent it out—that is, if he had become calloused to rejections.

In short, he was shooting in the dark; trusting to luck and to the percentage of averages that some day one of his stories, or poems, or essays, or articles, would win the favor of an editor and he would "be over." Then he would be recognized and his work would be in demand. And if he kept at it long enough (maybe a month, maybe a year, maybe five years)

he would finally win an acceptance. And then perhaps another.

About this time he would begin to lay plans for the future, when he would have fame and wealth. When, lo and behold, back came his latest and best product, accompanied by the long-familiar rejection slip. He sends another script, and back comes another slip. And once again he is back in the blind rut. The worst of it all is that he has nothing to take hold of, he has no idea how far he has traveled nor how distant he is from this goal.

There is an old saying that everyone has a story—and it is an undeniable fact that thousands of beginners, many of them young school girls, at first blush, have written interesting stories and even books that found ready sale—and who later could not repeat.

It is this that gives writing its gambling flavor and that holds its followers as does the gambling table and the prospector's lure. Always the next manuscript, like the next hand or the next claim, may be the turning point, the "strike," the break of luck. And by the same token it is the thing that leaves the struggling writer forever in a quandary as to his chances of ever making good.

The one route that has permitted the young writer to proceed steadily along the path of his chosen profession is through the newspaper office. Many a famous writer has learned his art in the office of the great newspaper. But, unfortunately, newspaper work is not the best training for all kinds of writing, and many writers have had to unlearn all that was taught them in newspapers in order to make a success of the special kind of writing they were to do.

For example, newspaper work is the finest kind of training to teach one to ferret out news, to develop resourcefulness and to learn to meet worth-while people. It offers a concentrated and high-tension course in news gathering, in taking care of one's self and in handling situations—items mighty valuable to the writer of news or articles. But when it comes to actual writing it does not do so well. Its first requirement is speed—and haste is not conducive to good writing. Also it is not conducive to good thinking, nor to the development of original philosophy. It teaches one to contract and concentrate, to conserve space and to jam as much thought as possible into as few words as conceivable. This does not make for clear, powerful writing.

Because of the speed with which the paper is thrown together, style must be sacrificed for speed and thoroughness sacrificed for condensation. Because of its fleeting nature, the newspaper requires only superficial treatment of all stories except editorials. All the grain that goes through the daily newspaper office and into the paper's columns is not grist for the writer of stories or essays or serious articles. The style of the newspaper is not the style of the magazine article or story, the novel, the history or the drama.

So a newspaper training by itself is sufficient only for the newspaper writer, though many a newspaper man has, by specializing on the writing of special articles, interviews and acting as correspondent, developed an ability to write for magazines and book publishers. The schools now teaching journalism and literature realize the limitations of newspaper training and are offering courses in journalism and story-writing designed to correct the shortcomings of newspaper

style, and to train beginners in the game of writing.

All of which indicates that there must be considerable to be learned about writing in general before one attempts to strike out on the sea of literature. And there is, for writing has as many branches and angles as has any other line of endeavor, and to attempt to write without knowing definitely what class of writing you wish to follow is to burden yourself with a heavy handicap at the very outset.

We have learned that Salesmanship and Advertising and Electrical Engineering are all professions of specialization; that there may be a dozen different branches of any one of these professions and that each branch is a life's work in itself. We have found that not only do the different professions require different qualifications from those entering them, but that the different branches or special phases of each of the professions also require individual qualifications—and offer different rewards.

And so it is with writing. For our purpose we may divide writing into four general classifications: Imaginative—poetry, fiction, drama, motion-picture scenarios. Descriptive—scientific, historical, repertorial. Editorial—political, inspirational, educational. Advertising.

Surely even the most inexperienced novice can, at first glance, understand why special training is required, not only for each general classification, but for each phase of classification. In descriptive writing, for instance, anyone would appreciate that a scientific education is necessary to the writing of scientific articles on medicine, chemistry, physics or electricity and that special training is needed to enable one to do repertorial writing. This because a newsgatherer must be trained in the school of experience to know the sources from which to draw his information, and to know how to garner those essential facts which are often hidden under a mass of unessential trivials, or disguised or even suppressed. He must be nimble-witted, tenacious and resourceful—able to handle men, circumstances and situations.

In other words, the mere ability to write smoothly and interestingly would not qualify one to become a first-class reporter, any more than would the ability

to write the most popular kind of fiction or the most fascinating photo-plays. The job of the reporter is to get the facts, to get the meat of the story, and to rush it in to the paper without the loss of a second of time. Later he may be called upon to write the full details of the story, though it is more likely that the "rewrite" man in the office will do the actual writing, drawing upon his trained imagination for the coloring and descriptive phrases that are to turn the notes and facts before him into a gripping story.

In editorial writing we see that the political writer must have a wide and keen knowledge of politics and that the inspirational writer must understand human nature and know the weaknesses and little prides of his readers. He must be able to draw stirring and convincing pictures with his words—and know what he is talking about. He must possess to the greatest degree what we will call written personality. He must carry his readers with him. And the educational writer must, of course, be a natural educator and have a worth-while message for his readers.

Thus we see that the ability to write the finest kind of verse or the most convincing fiction would not qualify one to fill a reporter's job and that a score of years at the reporter's desk would not necessarily prepare one for editorial or imaginative writing. The truth of the matter is that the mere ability to express oneself clearly and grammatically does not turn one into a writer, for the first essential in professional writing is that you have something to say. And you cannot have something to say without doing one of two things: gathering facts and news for distribution or producing original thought. After all, it doesn't matter how nice you can say it if you have nothing to say.

All of this clearly proves that the ability to write is merely the possession of a conveyance with which to circulate a thought, information or news. If you do not have thoughts or information worth circulating, the ability to express yourself in written language is of no particular value. This sheds a new light on writing and its requirements, for we cannot help but realize now that the ability to write correctly and interestingly is lost unless



Mary Roberts Rinehart Has Won a Wide Popularity. She Has Always Something Worth-While to Say and Has Learned How to Present It Entertainingly. She Began Writing as a Nurse

we have something worth saying, to which people will respond.

And there you have the reason for so many failures in the writing game—the novice concentrates his efforts upon learning how to "write," without realizing that he must first learn how to "think." An editor will buy a manuscript full of misspelled words, grammatical errors and without any sort of punctuation at all—if it only contains something really worth giving to his readers. That something may be a story, a bit of original verse, a scientific article or some homely philosophy.

To iron out the grammatical, rhetorical and other minor errors is a simple matter for an editor or publisher. He can hire a staff writer to do that at a very nominal price. But the thought or the information—that is what he wants! This does not mean that one should not learn the mechanics of writing—for the young scribe will find plenty of breakers ahead without water logging himself with an awkward style and a carelessly done

(Continued on page 295)



A General View of a Section of the Famous Signal Hill Oil Field in

The World's Richest City

by ROY ALDEN

WHILE most cities in the United States are wrestling with the problem of reducing property taxes, Long Beach, California, a city of eighty thousand people, has so much money in its city coffers that the officials of that municipality are having a hard time figuring out the best way to spend it. Royalties from oil wells drilled by oil companies on the three hundred acres of oil-bearing lands owned by the city in the famous Signal Hill district are multiplying with such rapidity that Long Beach is expected to be in a position soon to completely do away with all taxes, if it chooses to do so.

Long Beach, as a municipality, is being heralded as the richest city in the world. This year, with activity just started on the city-owned property, the royalties exceeded three hundred fifty thousand dollars, and it is estimated that if all the wells now drilling on the city land produce as generously as those already completed, the city will not only be able to provide for its entire annual budget of two million dollars out of its oil revenues, but will have considerable to spare. Eighteen months ago Signal Hill was like any one of a hundred such domes in southern California, while today it has reached a place second to none in California in the matter of production.

Though Long Beach, as a municipality, is the greatest oil producer in the world,

the city is not the only participant in the riches pouring from the ground. Hundreds of working men who purchased lots in the Signal Hill district years ago to escape from the high rents and high realty values closer in, were made rich overnight as a result of the discovery of oil on or near their properties. Outside of the tract owned by the city, most of the land in the Signal Hill district was controlled by the poor and when the great horde of oil companies sought to lease the now valuable acreage it was to the folks of moderate means they had to come. Hundreds of families in Long Beach were enabled to enjoy daily incomes ranging from twenty-five to five hundred dollars as a result of the oil discovery in Signal Hill.

The city officials of Long Beach are inclined to look with disfavor on the reduction and possible complete elimination of taxes by using the oil revenues to provide for the city's annual budget.

"At the end of five years the oil may be gone and then the people would be so used to being tax-free that they would probably set up a loud protest when the tax statements would have to be sent out again, with resultant injury to the city," it is argued.

No definite decision has yet been reached as to what to do with the flood of money coming into the municipal treasury from the oil royalties, but it is



Which the City of Long Beach Owns 300 Acres of Oil-Bearing Lands

more than likely that a large portion of it will be spent during 1923 in the erection of a great municipal auditorium, in providing additional parks and playgrounds, acquiring and developing the city's beach front, etc. It is pointed out that in this way all the people of Long Beach, whether property owners or not, will derive equal benefit from the city's great prosperity.

Due to the tremendous output of each well in the Signal Hill district and the extensive holdings owned by the city in the very heart of the producing center, Long Beach may eventually be forced to apply at least a portion of the revenue on taxes for lack of other ways of spending it. There is no way of estimating the possible producing life of the wells in the Long Beach field since the district, as an

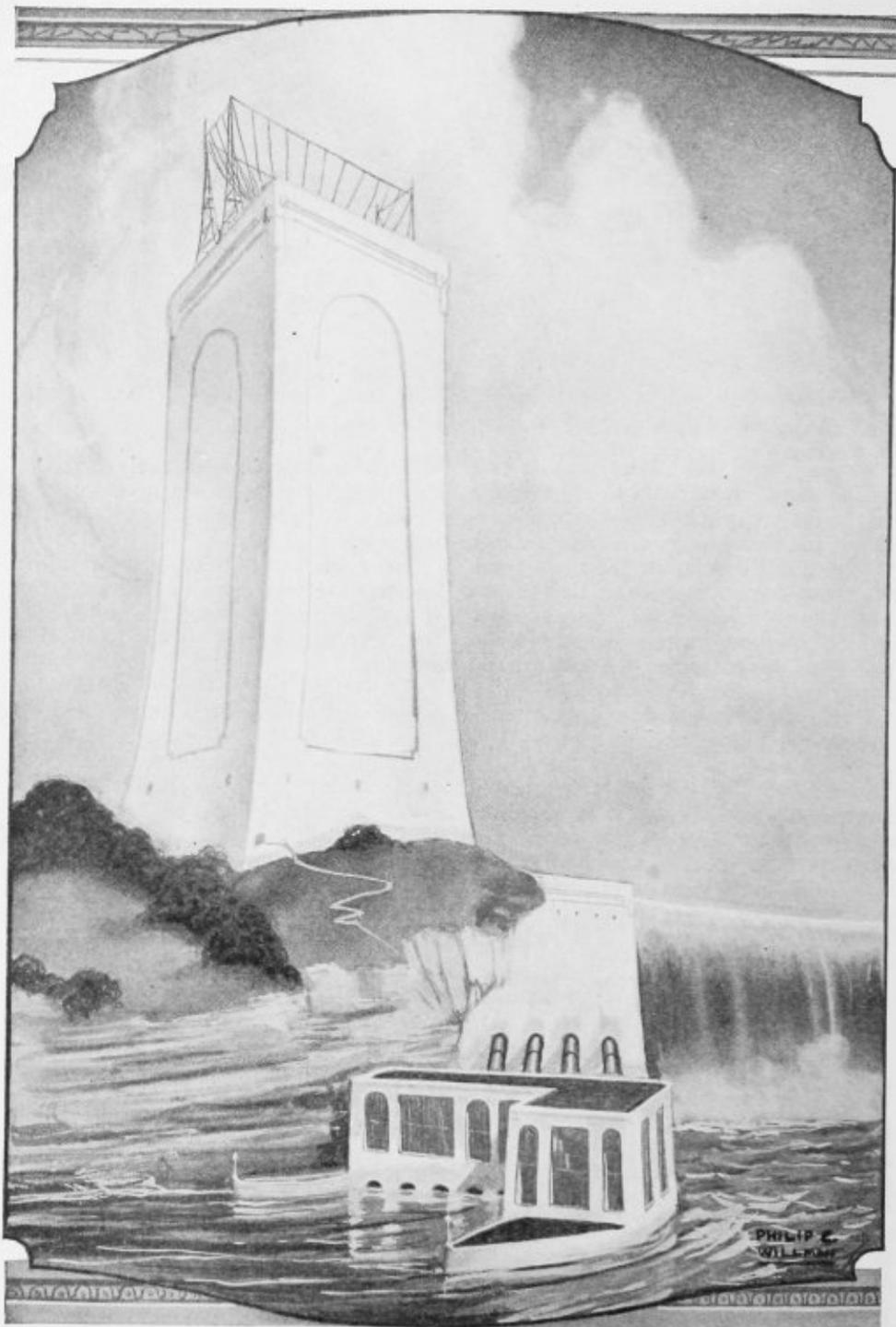
oil producer, is comparatively new, but experienced oil men are confident that within a very few years the city will be independent of taxes.

Some of Long Beach's most ardent boosters are even inclined to believe that if the oil revenue keeps on multiplying the "city may pay dividends to its residents."

To live in a city and enjoy all the benefits of metropolitan life without shouldering any share of the expense is a rare proposition. But, instead of that, the better procedure for Long Beach to pursue is to beautify and endow its commonwealth so all additions to its territory, public institutions and government shall be of a permanently attractive nature. Long after the oil is gone, these will bring people to Long Beach.



A "Lake" of Oil at Signal Hill That Poured from One Well Before It Could Be Brought Under Control. A Waste of Thousands of Barrels Is Represented in This Pool



Perhaps the Future Will See Huge Storehouses, Veritable Giant Storage Batteries as Pictured Above: Here the Tremendous Electric Power Created from the Waterfalls Will Be Stored Until Needed, Then to Be Carried to Its Destination as Waves of Wireless Electric Energy

SETTING CIVILIZATION FORWARD A HUNDRED YEARS

How Two or Three Much-Needed Inventions Will Bring To Us the Real Electric Age

by MARK H. REVELL

THIS is the story of a chance awaiting the right man or men to win undying fame and tremendous fortune. It is the story of a chance almost unique in history to break a deadlock in the progress of the race. It is the story of two or three inventions, which, when made, will enable us to duplicate the progress made last century within a decade or two at most.

"Extravagant and flamboyant" you say? And "Human progress doesn't go in jumps that way," perhaps? Ordinarily you would be right; human progress isn't made that way, as a rule. But once in a century—once in a millennium, perhaps—the chance for a jump does come; and such a chance is with us now. That is why this opportunity was called almost unique in history.

What are these inventions? They are the inventions needed in order to usher in the real Electric Age.

Here we need perspective, lest we be tempted to say, "But the Electric Age is here right now." By Electric Age we do not mean an abundant use of electric light, nor mere "electric fripperies," such as electric dishwashing machines and radio broadcasting sets. The real Electric Age is something different entirely.

Its true meaning we can get best by obtaining perspective upon our own times from, say, the viewpoint of the eighteenth century. Two hundred years ago, in this century of the 1700's, laborers worked from twelve to fifteen hours a day, and an immensely higher percentage of the population consisted of laborers than is the case today. Yet with all this labor, the world barely raised food enough to go around. The slightest crop failure precipitated famine. Scarcely a road in the world was paved. They couldn't be when it took the labor of four men to raise food enough for themselves and one other. The surplus fifth was barely enough to provide artisans in essential industries, mariners, soldiers for

the tiny armies of those days and members of the so-called "higher classes." Progress—industrial, social and scientific—was slow indeed, because the world couldn't support non-food-producing workers enough to put real steam behind it.

Today the world has twice as many mouths to feed, and immensely higher living standards. Yet the percentage of laborers is much smaller than it was two hundred years ago. We support with ease a tremendous army of public workers, teachers, scientists, writers, artists, who are making life richer, better and happier for all of us. Our nonagricultural workers include millions engaged in building railroads, paving streets, and similar activities devoted entirely to making life easier and more productive. We have labor in abundance now for executing any project that seems worth while.

Why? Because of machinery and the steam engine. Thanks to increased productivity made possible by these, one man can raise food enough for himself and one other; only half our population is on the farms today, in the United States. Instead of an old-time cobbler being able to keep a few hundred people in shoes, as was the case two hundred years ago, a few thousand factory hands, with machinery, can make shoes for a million. Therefore, after all essential industries are manned, we have an immense surplus, both human and in capital, available for efforts directed toward improvement. The capital surplus is not well distributed, perhaps, among the different classes, but it is there, which was not the case two hundred years ago. We are making the rapid progress which creation of this surplus in the past two centuries has made possible.

So much, then, we must credit to machinery and the steam engine—and that brings us to the Electric Age. In order to grasp its significance, we must look behind the scenes a bit, see into the founda-

tions and dark places of the present Steam Age, and see upon what cost and toil it rests. Then we shall see wherein the Electric Age will be so tremendous an improvement.

All the benefits of the Steam Age rest, in the United States, upon the labor of well over a million men and an investment in coal mines alone, of over \$2,343,900,000. Eight hundred thousand men are required in a normal year to mine, haul, and handle the coal needed to produce the steam power used in the United States. Experts estimate that 34 per cent—over one third—of all the tonnage carried on American railroads consists of coal, and that this traffic employs the services of well over ten thousand locomotives, and nine hundred fifty thousand coal cars. Add to these investments the value of land used for coal yards and storage, cost and labor of producing and operating coal-handling machinery and power plants, and you see the labor and capital required in order that we may enjoy the benefits of the Steam Age.

Meanwhile, engineers and geologists tell us, in our rivers and streams alone there is power enough to do every bit of this work! Our industries use approximately fifty million horsepower a year; and our potential waterpower, even without storing spring-time floodwater, is from fifty million to fifty-four million horsepower. With such storage, several reputable estimates claim that we have available two hundred million horsepower. This is waterpower alone, mind you; it takes no account of the electricity we might get from harnessing the wind, the sun, and the tides.

This power, we are told, could be distributed, once the dams and machinery were installed, by forty thousand men! This means that power for the nation, after the necessary installations, would cost only the wages of these men, and replacement and maintenance costs for the dams, dynamos, and transmission lines. Contrast that with the tremendous annual bill for steam power sketched above! And think what such a cheapening of power would mean to all of us!

One tiny detail—the matter of domestic heating—will illustrate the possibilities. It is perfectly feasible now, as a

matter of engineering, to heat a house by electricity. We don't do it, because the current bill would be too high. But with cheap current—well, what householder wouldn't like to turn a switch at his bedside, instead of getting up to start the stove or furnace?

The possibilities in industry are staggering. We use handpower now in countless back-breaking, soul-grinding tasks because power processes, all things considered, would be more expensive. But with cheap power available, the situation would be reversed. The only use for handpower would be in tasks requiring special skill and delicacy. Our railroads, relieved of coal traffic, would be able to haul half again as much tonnage as at present, and thus could care for that much increase in national production without expanding their present facilities.

But the most impressive possibilities are in the effect upon that barometer of social and economic progress—the length of the working day. In our century the working day is from four to six hours shorter than it was in 1700, simply because eight or nine hours' work on the part of present-day producers gives us all the goods the world needs. If we divert the labor and capital now devoted to producing steam power into other channels, and increase machine production in proportion to lowered power costs, there is no reason why six hours, or even less, might not be enough in productive industry. Since production would be the same as now or better, so would the monetary return to workers, owners, and managers. In view of the common statement that much of our present-day industrial unrest comes from the monotonous nature of factory processes, the possibilities for social good in this comparative emancipation of labor also are suggestive, to say the least.

There, then, is the real picture of the Electric Age—an age with as great an emancipation for all over present conditions, as steam gave from the days of hand and horsepower. And power is available, waiting to be harnessed. Why, then, are we not harnessing it? Why aren't we working tooth and nail to bring about this new Age, when the day's work will consist perhaps of five or six hours,

when everyone will have money and less trouble, and when life will be better all around?

The answer is simplicity itself. We are not working to bring about the Electric Age because as yet we lack three or four inventions essential to it. The race is marking time, waiting for them. The instant these inventions are made, we shall be up and away to these better times, and the lucky men who make them may settle down to fame and fortune. And that is the opportunity we mention—the opportunity awaiting the men who make these necessary inventions.

What are the inventions needed?

First is one that will solve the transmission problem. Our waterpower exists most abundantly and can be harnessed most economically in the west and south, where rivers on the average are strongest and payment for areas flooded by dams would be lowest. But the power is needed in the east and north and, with our present methods, electricity cannot be transmitted economically more than two hundred and fifty miles! Even this distance is achieved only by using pressures in hundreds of thousands of volts—pressures so high they leak off into space around the wires, and become seriously diminished after journeys longer than stated.

It follows that before we can harness all our water power to advantage, either we must relocate our rivers—an impossible task—relocate our industries—a task that is all but impossible—or solve this transmission problem. And there is opportunity No. 1 for you to break into the Hall of Fame and the company of multi-millionaires.

Second on the list of difficulties to be solved is the storage problem. The beauty of coal is that after being dug it can be kept where you want it, and until you want it. Electricity must be used as it comes from the dynamo or not at all, and, with hydroelectric power, the dynamo runs only when the water runs. Since most of the streams we should have to use are at their highest in the winter and spring, either we must do the bulk of our work then, or contrive some means of storing the excess generated during these months and pay it out during the lean season.

For this we have two methods at present—storing the water in special reservoirs, or storing the electricity in storage batteries. On the scale that would be needed, both are out of the question. The Mississippi in spring-time floods discharges 1,630,000 cubic feet a second more than its average flow. To store even a week of this excess, we should need reservoirs containing 986,000,000,000 cubic feet. With a depth in the reservoirs of twenty feet—more on the average would be impracticable, considering the country through which the Father of Waters flows—the reservoirs would cover 18,000 square miles of our richest land, approximately half the state of Indiana! And this is only a week's flood-time flow of the Mississippi alone, remember!

Appropriation of land on such a scale is impossible. Consequently hydroelectric developments are confined at present to regions like Niagara, where stream flow is relatively constant, or are supplemented by steam plants for use in summer months—which is precisely what we want to avoid. And last but not least, there is the matter of evaporation. If we used the water storage method, we should have to guard against our stored power disappearing into the air!

The storage battery case is even worse. Everyone who drives a car knows the weight of battery required even for current enough to supply a self-starter and the lights. Think of the size and weight of battery that would be required to store horsepower by the million!

There is no reason, however, in the nature of things, why an adequate storage means cannot be devised—and if it were, it would clear the way not only for hydroelectric development, but for the third great opportunity—an invention of devices for harnessing wind, sun, and tides. We have a good device for harnessing the wind in the windmill, but it works only when the wind blows. Hence, the storage problem must be solved before windmills will be worth much in this connection. Harnessing the sun is subject to the same condition, with the additional requirement of an adequate method for utilizing sun power.

We have sun motors, now, it is true, which use great mirrors to reflect and

(Continued on page 294)

Could You Land a Monster Game Fish with a Spool Cotton Thread Line?

The Noted Angler and Author Who Has Held the World's Record Since 1916 for Catching the Largest Game Fish (a Twelve-Pound Florida Barracuda) on the Lightest Line, Clark's No. 24 O. N. T. Spool Cotton Thread, Here Tells About the Most Exciting Episode in His Angling Career

by FRED BRADFORD ELLSWORTH

MOST anglers have read or heard about The Cotton Thread Fishing Club of America, whose headquarters are at The Raunt, Jamaica Bay, New York, whose members catch several thousand fresh- and salt-water game fish each season, with split bamboo rods weighing from three to six ounces and about six feet in length and for a line nothing heavier than a spool of Clark's No. 24 O.N.T. spool cotton thread and similar lines. The breaking tension of the No. 24 thread is about three and one-quarter pounds.

To see these members trolling from motor boats until a strike is obtained, then play and land the fish is a joy forever. It is a sight that gives a novice something to think about when it comes to skill in handling a game fish with such tackle.

The last time I fished off the Florida Keys on the East Coast, several members of The Cotton Thread Fishing Club of America, were there for big-game sea angling. Frequently, for diversion, we all went out together in one launch to spend the day catching barracuda, kingfish, etc., with cotton thread.

It was a glorious February morning, one of those perfect days that are a distinctive feature of the Sunshine land. With Boatman Jordan at the wheel we soon headed out to sea, bound for the Gulf Stream in quest of sailfish. On reaching there we started trolling and cruising about looking for them, but could not locate any.

Suddenly we ran into a school of dolphin. We had often caught them with cotton thread, but never before had seen them in large numbers. A dolphin is one of the most beautiful fish I know of. In the water its color is kaleidoscopic and of gold, blue, green and rose; I doubt if the gorgeous splendor could be imitated.

We caught quite a number with "Light Tackle," releasing them at once. Then I utilized my cotton thread outfit and caught several very gamey ones. They made from six to ten leaps and weighed about a pound and a half each. Finally

we saw a large one, and after Jordan had placed an attractive piece of mullet on my hook, I threw the bait over and quickly stripped line from my reel. As my bait sank, a big dolphin rushed for-



Fred Bradford Ellsworth with a Twelve-Pound Barracuda, Taken at Long Key, Florida, January 8, 1916, with Clark's No. 24 O.N.T. Spool Cotton Thread. This Is the World's Record for the Largest Game Fish Taken on the Lightest Line

ward and seized it, and Jordan stopped the engine.

"If you can land that baby you're a wonder," exclaimed Jordan, much interested. "It weighs twenty pounds at least, possibly more."

"I hope so," I replied. "Remember the day I played a barracuda, fully as large, for forty minutes?"

"Yes I do," he said, "and at one time the fish had out over a hundred yards of cotton thread, but in thumbing the line on a rush, the pressure was too great and the line parted."

Holding my little rod at the proper angle in my right hand, with thumb resting on the spool I let the fish take out about thirty or forty feet of line. Then pressing gently on the line, I took up the slack and with a twist of the wrist drew my rod backward, and the "feel" told me the dolphin was hooked. A very fine sharp hook should be used, because you cannot snub hard with such a line and a fish practically hooks itself.

The dolphin, on feeling the taut line, made a wild rush and then started leaping. It made fifteen leaps and took out about one hundred yards of line the first run. Possibly the reader will have some conception of what it means to have a twenty- or twenty-five-pound fighting game fish on the end of such a line; of the delicate handling of the rod and skill required to play the fish.

When it stopped at the end of the first rush I emulated the same method of holding my rod as when I made the record. This was by quickly changing it to the left hand, palming the reel with three fingers under it—the forefinger to

steady it and thumb to control the line, and used the tips of the thumb and forefinger of the right hand to reel with.

Very carefully I retrieved a little line and the dolphin turned and with considerable speed made another run and several leaps. The line bowed now and there was considerable slack. This was bad, for when it occurs the water causes additional strain. If the launch had been started to follow the fish, it would have described a larger circle, causing more line to vanish and a greater pressure.

Again the fish ceased its flight, and I took in considerable line this time. To tell the truth, I felt confident of success now—for I knew the dolphin was tiring and the strain of the rod telling. He was swimming parallel to the launch and we could see him at times. Very cautiously and slowly I was working him in and endeavoring to head him towards us. My rod bent gracefully each time I forced the fish forward. I knew the pressure of my thumb on the line was nearly the limit. Now he was on top of the water and sailing along beautifully, but still a long way off.

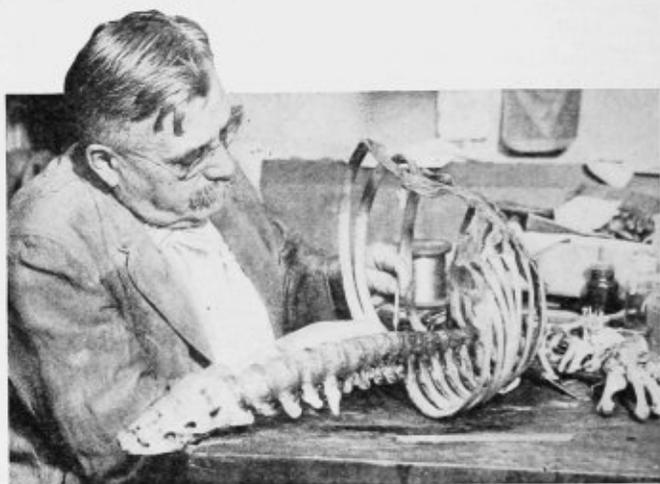
There is less resistance when a fish is on the surface and I was enabled to play him better. But in that position they are likely to jump at any moment—then look out! That is just what this sagacious dolphin did a few moments later. I was anticipating just such a play, and it occurred when I had finished reeling and was about to "pump" again. The very instant the dolphin leaped I raised my rod and maintained a taut line, but the fish escaped. This was the most exciting episode in my angling career.



Mrs. Ellsworth Was the First Woman Angler to Take a Kingfish on Cotton Thread. This Fish Weighed Three and One-Half Pounds



Near Sydney, Australia, a Monster Sea Leopard Sixteen Feet Long Attacked Some Fishermen Who Had Wounded it. It Was Killed. The Animal's Coat of Fur Is Worth a Small Fortune



Mr. Mignet Has the Cheerful Job of Assembling Skeletons. He Is Attached to the Smithsonian Institution and Likes This Job of Assembling the Frame of a Giant Gorilla



The Very Latest Idea in Sleighs Is This Motor-Driven Caterpillar Affair Propelled by a Gasoline Engine. The Sled Climbs Hills or Mountains. It Is Capable of a Speed of 45 Miles Per Hour

Only a POSTAGE STAMP

but

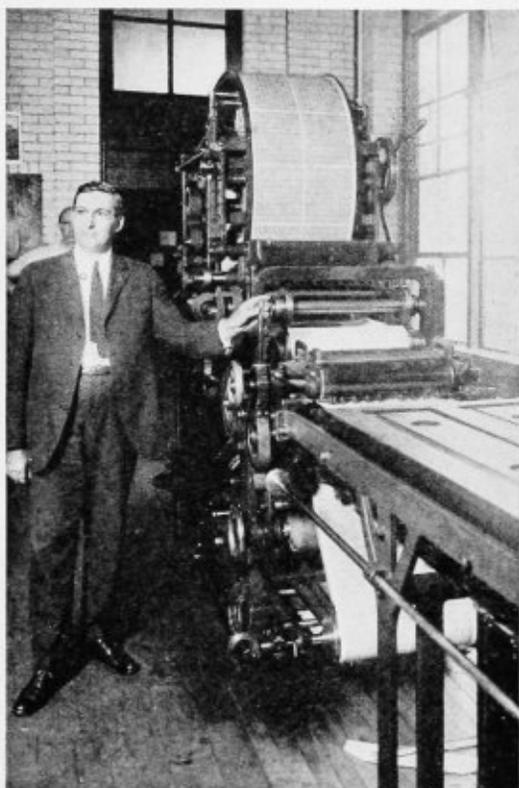
*Have You Ever Wondered How Many
Operations It Must Pass Through to
Reach You for a Licking?*

by EVERETT SPRING

WHEN you exchange two cents at the post-office window for a postage stamp, you probably do not realize the infinite care that the government has exercised to bring that little bit of gummed paper to perfection. It requires a bit of keen imagination to visualize the immensity of the daily output of postage stamps. There are manufactured each day an average of fifty million postage stamps. These stamps would cover eight acres, and placed end to end would make a strip eight hundred miles long.

In making fifty million postage stamps there are used three thousand pounds of paper, twenty-two hundred pounds of ink, and thirty-two hundred pounds of gum. Six hundred and fifty men and women are engaged in their manufacture. While this average production looms large and is large, it fades into insignificance when compared with the output of 315,265,000 stamps turned out in one day last October. This production made seventeen hundred packages, each fourteen inches long, twelve inches high and ten inches wide. It took five hundred sixty-eight mail pouches to carry the stamps, three packages to the sack.

An idea of the business growth of the United States may be had from the fact that the Bureau of Engraving and Printing delivered 13,354,943,861 perfect postage stamps during the fiscal year 1920. The sheets of one hundred stamps each, as sent to the post office, piled upon each other, would make a shaft over eight miles high, and placed end to end would make a strip twenty thousand miles long,



A New Method Evolved by Benjamin R. Stickney of the Bureau of Engraving and Printing, Prints, Gums, Perforates and Rolls Stamps Without Their Being Touched by Human Hands, and Requires Only Three Separate Operations as Compared with Twenty-four by the Old Method

and as there are ten rows of stamps in each sheet, a strip of single stamps would be two hundred thousand miles long, and would girdle the earth eight times.

The method used for printing the larger portion of stamps is accomplished upon what is known as the "four-plate power press." Four plates are used in order that the operation of inking, wiping, polishing and taking the impression may be done rapidly. This press requires the services of a plate printer to properly polish the plates for printing, one girl to lay the sheets in position, and another girl to take them off after printing.

After each two hundred sheets are printed upon the four-plate power press they are dried. To secure a flat surface for subsequent operations they are pressed in a hydraulic press. Next they are gummed by passing beneath a glass

roller which is bathed in a solution of dextrine, which forms the gum, and the sheets are then carried by grippers through a drying chamber in which the gum is dried in less than thirty seconds.

The printed and gummed sheets of four hundred stamps are put through a rotary perforator that perforates the stamps in one direction and cuts the sheets in half. Another perforator of the same construction perforates the stamps crosswise and makes another cut, thereby quartering the original sheets. The face and gummed side of all sheets are examined for imperfections. An operator then bands and seals each package of one hundred sheets with initials and date on seal.

Every package is stitched with a wire staple and sealed with the initials of the stitcher handling it. This insures absolute security and a perfect history of each package. As much care and attention is given to the making of stamp books and coil stamps as to any other operation undertaken by the Bureau of Engraving and Printing.

In the manufacture of postage-stamp books the paper, carefully printed, gummed, perforated, and examined, is received in half sheets of one hundred and eighty stamps each, three rows, three stamps deep and twenty stamps long, with a "working stub" of blank paper at the extreme top of each strip.

The sheets are separated by cutting machines, leaving white stubs. After cutting into strips, the strips are prepared for the next day's assembling. For example, two hundred strips of two-cent stamps, sixty stamps to the strip, are placed together with one hundred top and bottom covers, representing one hundred strips, ten books each, three sheets of wax paper, and two strips of stamps, making a package or box of one hundred strips of ten books each or one thousand books in all. The finished box of strips is then carried to a cutting machine, squared off on the back, cut to standard size, and a thin coating of glue placed on the smooth back to hold it for examination.

It is next very thoroughly examined and counted, after which it is stitched on a specially constructed stitching machine of ten heads which makes and places in

the work ten stitches at every stroke. The work is then taken to cutting machines in packages of one hundred strips and separated into small books. These are counted and small bands placed around each ten books. Six packages of ten books each are placed in a box with openings in the top so that they may be counted and sealed ready for delivery to the vault. The average output of one-cent and two-cent stamps in book form is about two million five hundred thousand stamps each day.

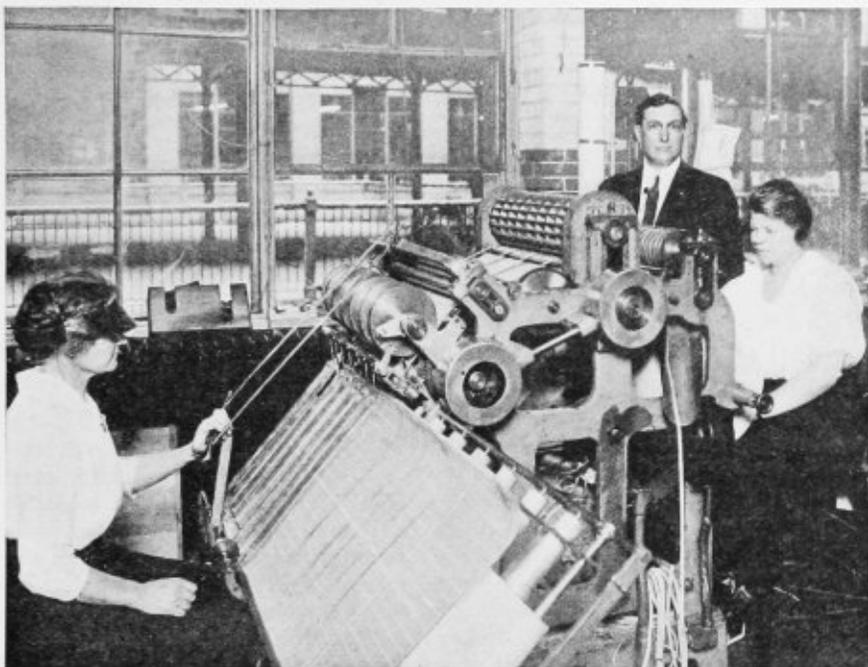
The process of printing millions of dollars' worth of postage stamps in coil or roll form has been revolutionized, in recent years, by an ingenious machine perfected by Benjamin R. Stickney, expert mechanic and designer of the Bureau of Engraving and Printing, which gums and perforates the stamps and prints them on the rolls, almost without human assistance.

After leaving this machine they are moved to an adjoining table, examined and counted in strips of five hundred stamps long and ten stamps wide. A separating label is placed between each section of five hundred stamps, then the coiling machine receives the work on reels and cuts them with rotating knives into ten parts, thus completing ten coils at the same time.

After a balance is reached on each separate main roll, the finished coils are carefully counted and boxed, then doubly wrapped with heavy paper ready for delivery to the vault. An ordinary day's output amounts to about eight and a half million stamps of different denominations.

Forty-five different kinds of postage stamps printed in fifteen different colors, in denominations from one cent to five dollars, are made for the United States and its insular possessions. The two most recent stamps issued by the Bureau of Engraving and Printing are the 11-cent stamp—the first copy of which, together with the die-proof prepared from the master die, was presented by Postmaster General Work to Mrs. Harding—and the Roosevelt stamp, which was placed on sale October 27, the Ex-President's birthday.

The safeguards thrown about the transportation of postage stamps to the local post offices of the country seems al-



New Perforating Machine Used by the Bureau of Engraving and Printing for Perforating Postage Stamps in Roll Form Crosswise and Lengthwise and Cutting into Sheets of 100 Stamps Each

most out of proportion to the value and importance of the stamps themselves.

The loss of a single one of the millions of stamps shipped out of Washington each day would mean that there is a hole somewhere in the system of protection. The boast is made that there are no holes, and the precautions taken for their safety is almost enough to convince one that the boast is not an idle one.

There are no open trucks for the valuable little postage stamps in those stages of its journey that reach from the printing press through the registry office out to the city and country post offices. At no stage of that journey are the stamps, whether in hundred or million lots, out from under the strongest kind of supervision and the most absolute safeguards.

The system of protection takes everything into account and provides for every emergency. For example, it was found a number of years ago that, although strips might be put around a package of the hundred-stamp sheets so that it was effectually sealed, it could still be torn and tampered with and a sheet abstracted. This might be done in the post office where the package was received, and the

claim then made to the Bureau of Engraving and Printing that the package had been short in count when it was received.

So the plan was adopted of putting a wire staple through the margin of every sheet of stamps sent out, the staple going through the outside seals of the package. Now it is impossible to remove a sheet from one of the sealed packages without leaving a stub to show that fraud has been practiced.

These safety devices are all that the Bureau of Engraving and Printing can provide. Up to the minute the package leaves the cage of the shipping division it contains exactly the number of stamps that it is supposed to contain. Even after these packages are opened in the local post offices the director will vouch for the number of stamps and will be responsible for any shortage.

The protection that surrounds the printing, gumming, perforating and counting of the stamps and their preparation for shipment is of a different character from that thrown about them after they start on their journey, long or short,

(Continued on page 297)

IS THE COLLEGE WOMAN A MISFIT IN THE BUSINESS WORLD?

by GRACE ANDERSON ORB

The writer of this article has well-defined views on the subject and expresses them plainly. It is not a case of "sour grapes," because she holds an M. S. degree and two other diplomas, and has actually done nearly ten years of university study. She has had considerable experience in the business world, both as an employe and as an executive. However, there are two sides to every question, so ILLUSTRATED WORLD will present the "other side" in the May Issue.—The Editor

THE statement that the college woman is a misfit in the business world was made to the writer by one of the largest employment managers in the Middle West and has been corroborated from many sources again and again. It is a fact that one of the hardest individuals which the employment agency has to place in the business world (if not the hardest to place satisfactorily) is the woman college graduate. She has no place!

And yet a large number of women—graduates of such schools as Vassar, Smith, Wellesley and scores of other schools—who have gone into the arts, domestic science, or higher education are leaving these avenues of the world's work and seeking entrance into the business world; an entrance which they are finding it exceedingly difficult to make with any degree of satisfaction to themselves. Nevertheless these are fine women; women whose minds are trained to think, and think logically and effectively, along many lines.

They have accumulated a fund of information on many things which, if they could apply it, would be of untold value both to them and to the business world which they seek to enter. They are well-bred, high-grade women, but they are a misfit when they attempt to enter business. True they are underestimated; but the stubborn fact remains—the business man does not want them! He's afraid of them! Again and again the recent high school graduate is given preference over her college sister.

Every day more and more women are finding profitable places in the great commercial fabric of our country. So it is not a question of man's prejudice against women in general; as a matter of fact, it is not a case of prejudice in any considerable degree. It is true that the present college woman is not fitted to enter into the business activities of today! And her proper placement in these fields is a vital problem which is as yet unsolved to any appreciable extent!

The college woman has not had the contacts with business which are absolutely essential. She has not had the training and does not know the habits and practices of business. She does not know these things as well as the college man and his knowledge along these lines is all too limited. The high school graduate who has taken a business course (either in the high school or business college) is really four years ahead of the girl who has just come out of the university without knowledge of these subjects.

Do you protest these facts? Let us look about just a bit. Here is a large retail merchant who is also doing a national wholesale business. He suddenly finds himself without an office manager—a position which commands from \$1800 to \$5000 a year, and even more if the firm is a large one. Where does the executive look for one to fill the vacant place? In point of general knowledge the college woman is admirably fitted for the position, but she has no knowledge of office management or methods. She is neither

a stenographer, typist nor bookkeeper herself and naturally she does not know how to handle a force of stenographers, typists, and clerks of various kinds. Dictating the various kinds of business letters which are required by the position is something about which she knows next to nothing! Office routine, which has been worked out in the interests of and which is absolutely essential to efficiency, is unknown to her. She has not had the discipline which is so essential in the making of a good manager. In short, she does not fit into the position! The executive has learned this. What does he do? He promotes someone from his own force, the usual way, or else looks about to find a girl with similar experience in a kindred line.

Take the many positions which lead to the executive's chair in banks, in large insurance offices, with the various manufacturers, wholesale and retail commercial establishments—services of many kinds including industrial management, advertising, and the like—all these are dependent upon a knowledge of definite business methods and procedures which are in large measure characteristic of the particular field. Knowledge of and contacts with the particular phase of business which the individual wishes to enter are essential to success in it. A certain amount of discipline is also required.

What is it, then, that governs the market value of a man or woman?

Before we answer this question, it might be well to think a bit about what the business world itself is—this great world of industry and finance. What is the underlying thought which is woven so persistently through it all?

Isn't it primarily one of "selling"? Each phase of the industrial world—the great hydroelectric plant which sells power, the manufacturers who shoe the world and those who feed it, the many hundreds of "services" (employment, industrial management, advertising, etc.), the banks, trust companies, and bonding houses—has "something to sell" humanity. The woman who would enter any one of these avenues of development must perfect herself in the knowledge of the particular practices of that particular field just as an engineer perfects himself in the principles and practices of civil,



Grace Anderson Orb, Herself a College Woman, Has Found by Experience What Is Necessary for Success

mechanical, electrical or chemical engineering before he attempts to enter these lines of work.

The man who expects to find his life work in mechanical engineering lines does not take a university course in the fine arts and expect this to teach him how to make a success of mechanical engineering! He may be interested in and study the fine arts but he must study mechanical engineering and equip himself for this particular field of engineering if he is to enter it and make a success of it. Then when he comes out and applies for a position with a particular engineering firm he has something to sell that firm. If his course of study in the university has been a practical one in mechanical engineering he can command a good position. After he has had some actual experience in putting his theory into practice, he will climb, and *climb higher* than the man who has not had the university training—other things being equal.

With the woman college graduate the situation is different. She hasn't a thing to "sell" except a lot of general knowledge which bears very little direct relation to the position for which she is applying. Naturally the business man does not want her service! She knows very little that

is of value to him! Nor is she quite as amenable to training as her younger high school sister. She has to unlearn some things before she can learn those others which are absolute essentials in the phase of business which she seeks to enter.

Just as soon as our universities and colleges wake up to a realization of the fact that they must train their women in business principles, practices, and "contacts" for the particular line of business which they wish to enter, then will the college woman find her rightful place in the business world and prove successful in that place! Until this is done the college woman must of necessity remain more or less of a misfit in the business world.

Then there is another thing which the college woman must learn if she is to find a welcome in business. And that thing is what has been well named "honesty of purpose." In other words, she must take the responsibility which she agrees to take for the given time for which she agrees to take it. There have been all too many women who have applied for definite positions which require continuous long-time service, and when asked by the executive who was hiring them if they would be permanent, have replied that they would be; when they knew at the time that they would not stay long!

Women have been notoriously unreliable when it came to keeping a promise to the firm with which they found employment. They have not recognized "business loyalty" as an asset. Whether this be unscrupulousness, or merely irresponsibility, the result so far as the employer is concerned is the same. And he rightfully resents it! There is no more logical reason for a woman to make a promise which she does not expect to keep in the business world, than there is for a man to do so. Nor can women expect to receive the confidence of business men so long as they refuse (or neglect) to accept this responsibility. It rightfully belongs to them and they must take it!

Take another example. The woman college graduate who aspires to a high secretarial position must ultimately come to a realization of the fact that, no matter how much she knows about science and the domestic arts or about law and the languages, unless she is a good stenographer and typist, she is always at a dis-

advantage if, indeed, she is able to hold a private secretary's position at all! The unfortunate thing is that somebody has not recognized this need and influenced her to study these subjects and perfect herself in them *before* she leaves college!

Again, there is the college woman who wants to enter the real estate business—a very productive field for woman's activity. Of how much value (that is, value that can be directly applied to her new work) is her university course in general science? What she needs to know is the governing factors which enter into real-estate values, the best methods and practices of real-estate salesmanship, advertising, and the laws governing these in the particular community in which she expects to work, as well as general business practices. Here, too, typing and stenography are almost, if not absolutely, essential.

Some of our colleges are putting in courses in advertising, salesmanship, employment management, etc.; and where the college woman has taken these prior to her attempt to enter these phases of the business world she has advanced rapidly! She has had something to sell! Her service was a trained, technical service in the particular work which she was attempting to do. She knew how to do the particular thing which she was attempting to do. Her services are constantly in demand, and at interesting financial figures. She is a success in the business world because she was trained for it!

Does all this mean then that a college education is not advisable for women who wish to enter business? By no means! But it does mean that the college woman who is not trained for the particular business which she wishes to enter is a misfit just as a man would be. And it also means that women have not yet recognized this fact in such degree as to attain the success which is possible when they do realize and act upon it.

The avenues open to the college woman in the business world are many and varied when she learns the technical phases of the business she wishes to enter! By all means let her take this training before she seeks to enter, else she is not only handicapping herself but becoming an economic loss as well!

Cho Tso's Spectacles and Yours

by H. E. PINE, Opt. D.

THOUSANDS of years ago there lived upon a sacred mountain in the Middle Kingdom, one Cho Tso. One day the Great Spirit visited Cho Tso and made known to him that if he would take crystals which the gods had placed in the sacred river and grind them with the sand and water of this river, then frame them in the shell from the back of the sacred tortoise that swam the mountain stream he would be able to see marvelous things. He would be able to see through the darkness, look into the future and spy out the secret places where treasures were hidden in the earth. The good Cho Tso did as the Spirit directed and was able to see all these things.

One day, however, while wearing the spectacles he saw the day of his death approaching and, true to the vision of the magic lenses, when the appointed day arrived he died. Even to his death, Cho Tso retained an interest in the optical business of China, for it was he who sent his messengers to put crystals on the sacred mountain where the lens makers of the future could find them. Thus runs the ancient Chinese legend, and while we moderns may not be able to subscribe to the truth of this story of the beginning of spectacles, we must admit that the comfort they can bring to defective eyes seems almost magical.

This legend has, by no means, lost its hold upon the Oriental mind, and many Chinese in America today are wearing lenses ground in this country from Chinese pebbles which they themselves imported. The writer has furnished

Typical Glasses of Chinese Dignitaries. At One Time the Sacred Tortoise Shell of the Frames Was Supposed to Bring Luck According to Size. Large Frames Were in Demand



three Chinese students of one of our leading universities with glasses, using pebbles which they supplied, although they disclaimed belief in the legend of Cho Tso. These pebbles, by the way, are in no way the equal of modern ophthalmic glass, and, because of the additional work required in grinding, cost these student wearers more than regular glass lenses.

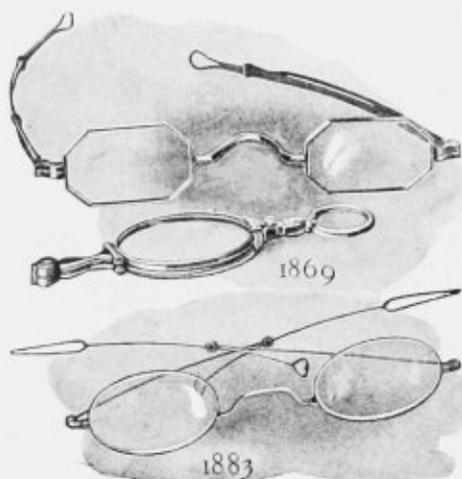
Written records do not uphold China's claim to priority in the manufacture of lenses, although there is record of tortoise frames being worn there a very long time ago. The wearing of these frames was restricted by custom, if not by law, to scholars and rulers, as the large shell circle around the eye was supposed to make the wearer resemble an owl, and therefore to acquire the quality of wisdom which this greatly overrated bird is supposed to enjoy.

Until recently in China it was considered an insult to address a friend without first removing one's glasses, much as the gentleman of our western world removes his hat when meeting a friend. It was a sign of grave disrespect to wear glasses in the presence of a judge. The judge himself, no doubt, would wear his



These Are George Washington's Own Spectacles. He Was Wearing Them at the Time the Constitution Went into Effect in 1789 and When He Was Inaugurated as the First President of the United States

glasses (if an empty frame can be classed as "glasses") as an aid to his dignity, if not to his sight. The tortoise is a sacred



The Progress of American Spectacles from 1869 to 1883

animal in China and the wearing of shell rims was believed to insure good fortune and long life for every wearer. Since this luck was believed to be due to the shell, the wearing of rims without lenses was thought to serve equally well and, because it was believed that the larger the frame the greater the luck, the wearing of frames of a very large size was quite common.

The first written reference to a lens was a mention of one used for burning holes in parchment in the comedy "The Clouds" by the Greek poet Aristophanes (450-380 B.C.). There is no authentic reference to the wearing of lenses mounted in any sort of a frame for the correction of faulty vision until about 1305 A.D., when Friar Jordan of Pisa said: "It is not twenty years since the art of making spectacles was found out, and it is indeed one of the best and most necessary inventions in the world."

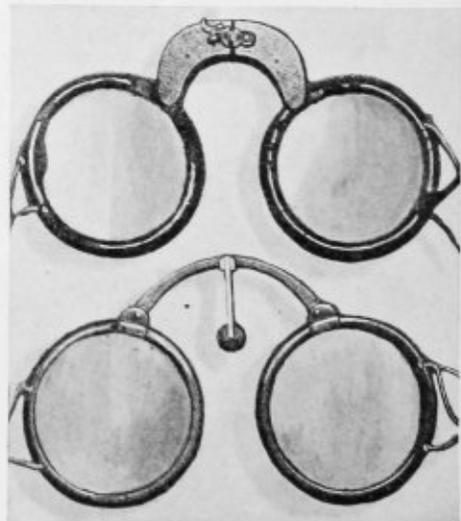
The invention is generally credited to an Italian, on whose tombstone may still be read "Here lies Salvino d'Armati of Florence, the inventor of spectacles. May God forgive him his sins." The wording of this inscription suggests the thought that his friends may have classified his invention as his chief sin. Let us hope that he had nothing worse to answer for.

About this time (1300 A.D.) there

seem to have been several men of science in different countries working along similar lines. In England Roger Bacon, who was often referred to as the father of science, was experimenting with magnifying lenses. So far as we know he never mounted these lenses into glasses, for in that day of superstition too much knowledge was likely to earn for its possessor a far too intimate acquaintance with the rack, thumb-screws, boiling oil, and numerous other forms of popular indoor sport. All during the Middle Ages scientific progress was at a standstill. This was essentially a religious era and any attempt toward scientific investigation or any attempt toward relieving human suffering met with disfavor, such attempts being regarded as efforts to thwart the Divine will.

As a result of this attitude the clergy joined with the medical profession in trying to suppress the fitting of glasses to defective eyes, claiming that it was a deliberate interference with God's purpose in afflicting the aged. Roger Bacon was imprisoned on several occasions, charged with practicing black magic, and these days in prison (and what prisons they had in those days!) seem to have cured him of any desire to be responsible for the introduction of glasses.

Of course, there was not the great need for glasses then that there is now,



A Group of Early Eyeglasses. Notice the Earstrings, the Joints in the Nose-Bars and the Metal Bar Which Rests Against the Forehead

for, to quote "The Book of Wonders," "there was so little chance of using the knowledge, very few indeed even knew how to read. Nor did the people in general do other things which require close application of the eyes. The fine gentlemen and ladies—if we are to judge from ancient tales—spent their time, respectively, in tournaments and fainting fits, while the men and women of the lower classes tilled the fields and kept the homes, and went to bed o' nights and saved their eyes. But with the introduction of printing a great change took place—not all at once, of course, but very gradually with the passing of the years. People all over the country (England) began to read for themselves; religious prejudices gave way; interest in science increased; the beginning of manufacturing crept in; international trade was organized; and Europe began to lead a more complex existence."

When lenses were first invented, and for many years thereafter, it was necessary to hold them by hand before the eyes, and while this was possible, even though not convenient, while reading, it was impracticable to attempt to work with such a handicap. Some scheme had to be worked out whereby lenses could be retained in place allowing the freedom of both hands. Today the dowager at the opera is served nicely by a lorgnette, but it would be hard to imagine a myopic hodcarrier climbing a ladder with his hod in one hand and his lorgnette in the other.

A helmet in which lenses were riveted was presented to Henry VIII, in 1535 and was, as far as we know, the first one of its kind made. For many years it was the custom to fasten the lenses to the hat brim; but, because all head coverings had to be removed in the presence of the king and because the constant wearing of the hat was unsatisfactory for other reasons, this system was not practicable. The top and sides of the hat or hood was, therefore, cut away, leaving a broad band which circled the head. Among the nobility this band was often painted or otherwise decorated. It is interesting to note that spectacles in this long-gone day were procurable only by the wealthy, as their cost, which in most cases was several hundred dollars, put them far beyond the reach of the average man.

It is certainly a far cry from these early, crude leather spectacle frames and their iron descendants to the light, rimless, gold mounted spectacles and nose glasses of today. Of course the change in frame pattern, as vast as it is, is not as great as the improvement effected in the

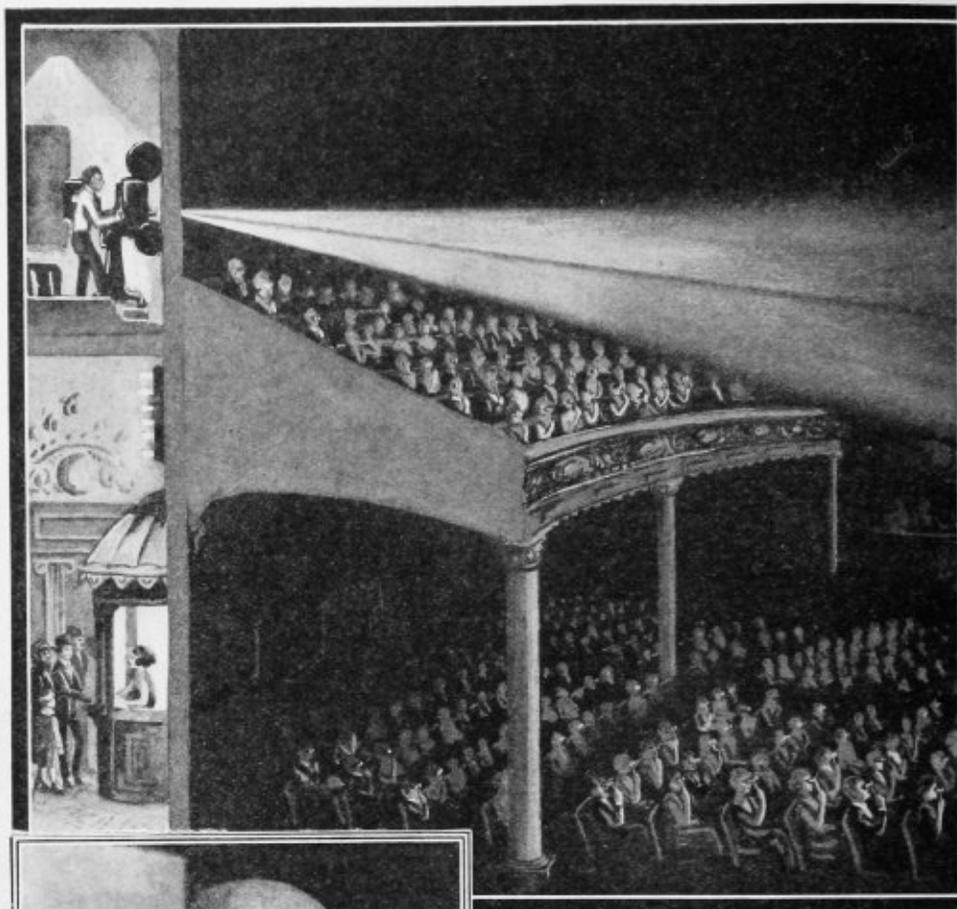


A Modern Descendant of Cho Tso's Spectacles

lenses themselves. In the earlier days there was no attempt made to furnish other than plain magnifying glasses, which were used by the aged for near work. Today about forty million people in the United States alone are wearing glasses, many of them for the correction of astigmatism and nearsightedness (myopia). These two conditions could not be corrected then—probably could not even be detected, as the method of eye-testing was as crude as the frame itself. When we visit the office of the modern optometrist and see the delicate instruments of precision which are in use for the examination of the eye and the detection of muscular strain, we are forced to admit that there is something new under the sun.

A few years ago a craze for old-style Chinese shell frames swept over this country, but this fad soon died a very natural and timely death, as the public today will not be needlessly disfigured by

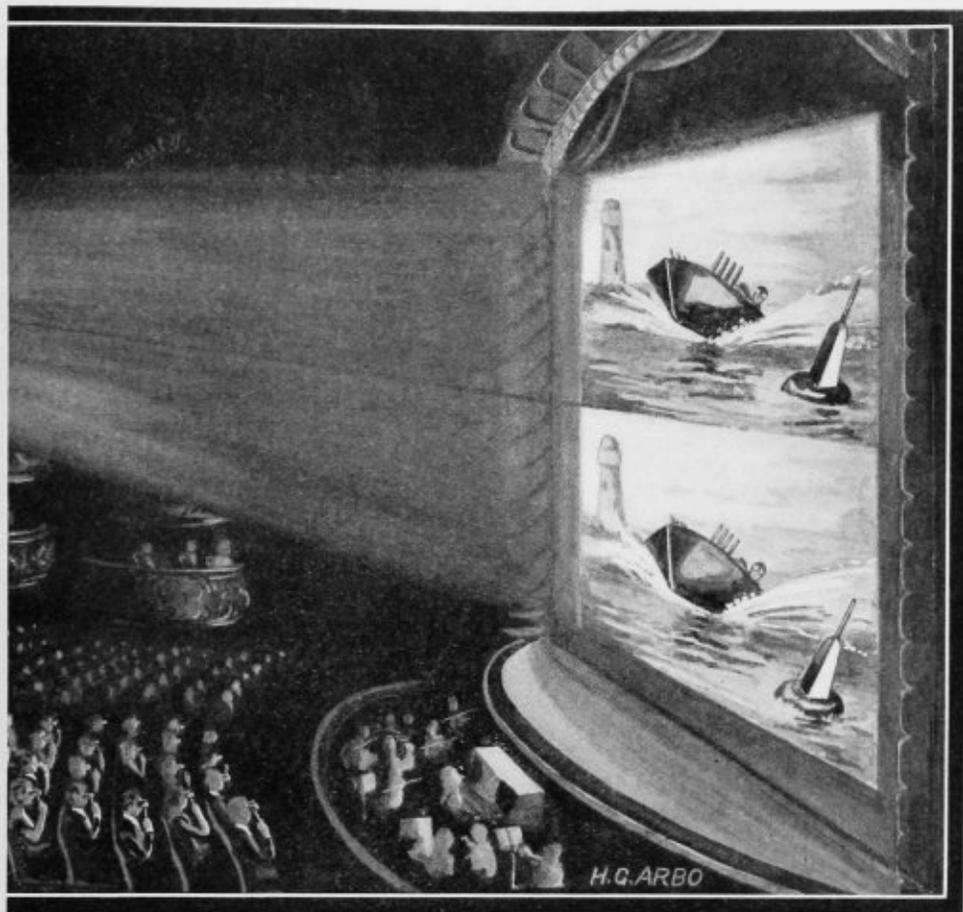
(Continued on page 302)



STEREOSCOPIC

THE moving pictures of today have height, width and motion, lacking only perspective to make them as realistic as the stage. Proper perspective is lost in the present method of filming such scenes as thrilling rescues on the crest of waterfalls, or leaping off a speeding train into an equally swift automobile beside it. Pictures appear flat to the audience and thereby lose at least 70 per cent of the thrill. However, a new stereoscopic method of filming does away with the aforementioned flatness and actually makes the scenes jump out on the screen.

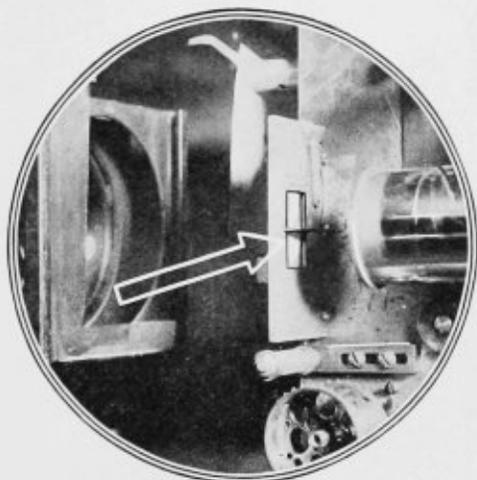
The stereoscopic movies are taken with two cameras set in positions corresponding with the right and left eyes. In the developing, the two films are printed as



MOVIE SHOWS?

a pair on one film. In the projection room this film is run through a machine with a double aperture, which throws two images on the screen, one above the other, the upper being the reproduction of the film taken by the camera representing the right eye and the lower representing the left.

The stereoscope-like instrument has for its eye-pieces prisms arranged so as to reflect the light rays from the upper picture to the right eye and the rays of the lower picture to the left eye. The two combine, on the principle of the old stereoscope, to show one picture and to also give the sense of depth. The important step was recently demonstrated before a number of scientists and proved to be an interesting success.



A Close-up of the Machine, Showing Double Aperture for the Pair of Pictures Which Are Projected Upon the Screen

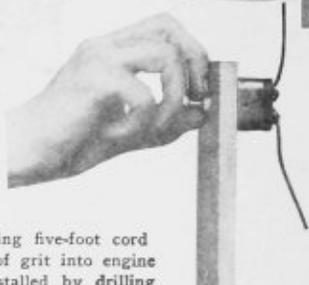
ACCESSORIES FOR THE MOTORIST



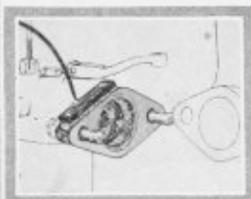
DASH BOARD



SAFETY FUSE



Above—Cigar lighter is equipped with self-winding five-foot cord
 Left—Dust trap for carburetor prevents drawing of grit into engine
 Right—Small electric push-and-pull switch is installed by drilling one hole and tightening one nut



Electrically heated wire gauze and deflector helps engine starting



Spotlight has bellows attached to windshield and works from seat of car. It has means for being used as a trouble light also



Deflector of new design efficiently prevents glare but gives strong light



Recently evolved set of socket wrenches assist quick repairs, having extensions and ratchet handles

BRIGHTENING THE CAR FOR SPRING

The Passing of Winter Has Left Its Mark Upon Your Car. Possibly All It Needs Is a Good Polishing to Make It Presentable. If This Is the Case, You Are Lucky. A Good Many Cars, However, Will Be Only Temporarily Renewed by Polish. Something More Permanent Is Needed to Give the Painted Surface a Bright, New Look for the Spring Season and for the More Glorious Coming Summer Months. A Reliable Method Is Here Told

by A. REINHOLD NIELSEN

A COAT of varnish will in many cases restore the gloss of your car. Such a coat of varnish put on by a regular painter will cost from fifteen to fifty dollars. This amount can easily be saved to you if you care to do the work yourself according to dependable directions.

The first requisite in automobile painting is to have a scrupulously clean surface to work upon and a dustless place to work in. Dust is the greatest enemy of varnish, because it will rise in the air and settle in the soft and undried varnish to form a surface that will be rough and gritty when dry. Therefore it is very important to work in a room free from dust.

Have the car washed beforehand. It is best to have the outer surface of the body rubbed with a fine grade of steel wool such as is used to clean aluminum ware. This is easier for the amateur to use and it does not have the tendency to leave scratches and streaks on the paint as sandpaper does.

Besides, steel wool is better to handle and easier to manipulate when working around curves and corners.

After the rubbing has been thoroughly done so that the surface feels

smooth and velvety to the palm of the hand, the entire car should be well dusted so that not a single steel-wool particle remains to be picked up by the varnish brush. If the car can be re-washed after being smoothed, it will decrease the likelihood of dirt or pieces of steel wool remaining to get into the varnish. When the car is ready, it should be driven into the room which has been prepared for it by having the walls and floor soaked with water to prevent the stirring up of dust while putting on the varnish.

Before applying the varnish, go over the surface to be refinished and look carefully for places where the paint has been scratched or chipped off. With a very small brush, touch the marred spots with a little paint of the proper color. This color should be what is called japan—meaning that it is mixed with japan oil, a flat drying oil which dries quickly.

Purchase a quart of the best varnish obtainable. It should be what is

termed spar varnish a varnish that will not soon be affected by the action of the weather. Cheap varnish would be false economy and any extra outlay is good business.



The Necessary Tools Are Few and Are Easy to Obtain at Your Neighborhood Store

A small brush for applying the varnish should also be purchased. This should be of high grade and not less than $2\frac{1}{2}$ inches wide. A brush of this sort will cost about a dollar and twenty-five cents, an investment which will pay well later in the smooth appearance of the varnish. It is also well to get another brush about three-quarters of an inch wide to do the windshield parts, instrument board and door hinges. Such a brush will be found especially handy when it comes to getting into cracks and crevices which would injure and break the bristles of the large brush.

A pint of turpentine will also be needed, some of which will be used to thin down the first coat of varnish that is applied to the car. A first coat must be put on to stop suction and to give a solid bed for the second and final coat. If only one coat is applied, the chances are that the suction will absorb the varnish here and there and make it appear dull in patches.

Use a small, round, open-top quart can to mix the varnish in. The first coat should be mixed with about one-third turpentine and about one-third of the quart of varnish. If the body is a bit discolored, it is well to stir in a tablespoonful of the japan color and then to strain the mixture through fine cloth to take out any small lumps that may not have been broken up and which, if left in the varnish, will make the coat rough. This latter mixture is

called color varnish and will tend to give the body an even-looking shade.

Do the body first because the varnish is clean and it is important to keep it so while the body is being done. The varnish should be flowed on with an even, straight stroke and brushed out so there is an equal quantity at every point. Do a small surface at the time, such as a door, or space between doors, and be very sure that the varnish does not "run" or "sag" so that it later presents the appearance of "curtains."

These sags and runs can be avoided by brushing the varnish carefully and evenly and by passing over the surfaces at least six times. While it is important to do this, it is also important not to rub the varnish out and expose a bare surface. This first coat is good practice in becoming more adept in applying the second.

After the body has been coated, the wheels and chassis should be varnished. It will be a great deal easier to apply the varnish if the wheels are first jacked up so that they may turn freely and be varnished as they turn. Care should be taken not to let any of the varnish run over on the tires as it will later present a very "bungled" appearance which can easily be avoided with a little care. After the car has been given the first coat, it should be allowed to dry for two days before the second coat is put on.

It is not now necessary to use steel wool on the wheels or chassis parts, but the body of the car should be gone over



Clean the Car Well With Steel Wool

lightly with the steel wool to remove any lumps that may have gathered. After the car has been well dusted off, preferably with a damp cloth, it is ready for the second coat.

The varnish which is used for this coat will be of almost the same heaviness as that poured from the original, sealed can. A very clean can should be found and about one-fourth of the amount of varnish remaining should be poured into it. With this small amount, the little things like lamp brackets, tire rack, glass front irons, hinges and other small parts should be finished. Do the wheels next. Last of all, the can should be rinsed very clean and the remaining amount of varnish poured into it. This latter amount will finish the body.

Before beginning to apply the final coat, clean the brush well. Be very sure that not the smallest particle of grit remains in it. Then proceed with the varnishing of the body.

This coat is most important and the greatest care should be taken so that its appearance will reflect credit to you. The "feel" of the varnish will be a good guide to follow in applying this coat. The pull on the brush should at all times be equal and the strokes of the brush should be first up and down and then crosswise. Repeat this motion three times and conclude with neat, careful strokes that follow the general trend of the piece you are varnishing. If it is the hood, the last strokes should be from the dash to the radiator and back; if the doors,

straight up and down; if the curved portion over the rear fenders, they should follow the general curve of the upper line of the body. These last strokes are what will give the final perfect smoothness.

It is well to go slowly and stop now and then to look over the work that has been done. If any sags are noticed they should be "pulled" out with an almost dry brush. Be very careful not to apply more varnish as that will only aggravate the trouble when there is any trouble. If the work has been carefully and conscientiously done, no sags will be found and the car, when dry, will have a mirror-like shine that will last throughout the summer season.

When the varnish has dried for a day or two, it should be dashed with cold water to set it. This tends to harden the surface and renders the varnish impervious to the

action of the weather. After having been well dashed with water, the varnished surfaces should be carefully chammoised. The car is then ready for many months of service.

Some car painters polish the surface of the varnish with powdered rottenstone. The effect of this is to give the car a high French polish. For the average owner, however, simple varnishing will prove to be entirely satisfactory and he will, furthermore, be spared much labor. The man who varnishes his own automobile will save money and will have the added pleasure of driving a car glistening with his personal handiwork.



Varnish Puts on a Final Brilliance

ALONG AUTOMOBILE ROW

SOMETHING new in a passenger bus has recently appeared on the streets of Detroit. This bus is operated by one man and has proved very successful.

The body of this bus is 20 feet long by 6 feet 10 inches wide. It has twelve double seats and one long cross seat in the rear. There is only one door, which is opened and closed by means of a long steel arm—the driver simply pulls on this arm to open the door and pushes to close it.

The bus seats thirty passengers. It is equipped with the customary "Pay-as-You-Enter" box, which is mounted close to the driver. It was found that the busses were very efficient and that



THE puncture vine or caltrop (*Tribulus terrestris*) is mentioned in the old Testament as "thorns." It has been introduced from Asia Minor into the United States and has spread along the highways in California.

That the translation of its scientific name means literally "Earthly trouble" can be seen by the automobile tires. Tires are punctured in 500 places if the least bit worn. The State of California has started a campaign of eradication against the pest and efforts are being furthered to enlist the assistance of motorists in particular.



one man was able to take care of the passengers besides doing the driving. Other cities will no doubt adopt a similar service which may take the form of independent lines or as an adjunct to already existing transportation systems.

DISCARDED automobile tires, which were so eagerly sought at one time by junk dealers and which eventually found their way back into new tires, have now lost some of their popularity in that way.

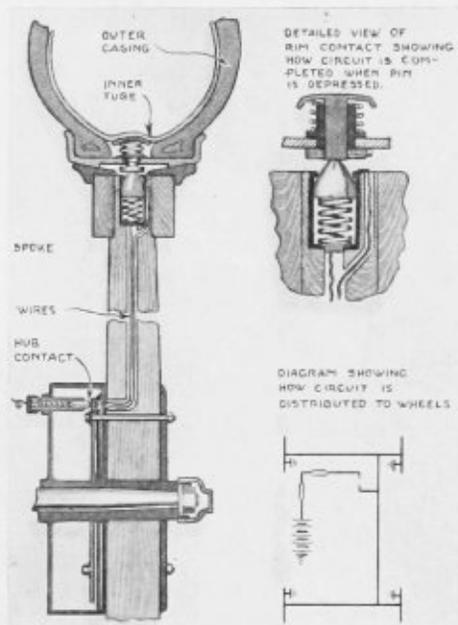
New uses are now being found for them. A gardener of Hollywood, California, has found a novel use for them by placing them around his roses and shrubs, half submerging the old tires to have them hold the moisture and fertilizer where it belongs. The circles add to the appearance of the grounds and the idea is being adopted by many who see it. If the old casings are given a coat of white-wash now and then, it will tend to give

the grounds a clean and well-kept look. The perfect circles are a pleasing change from the whitened cobblestones previously used for this purpose.

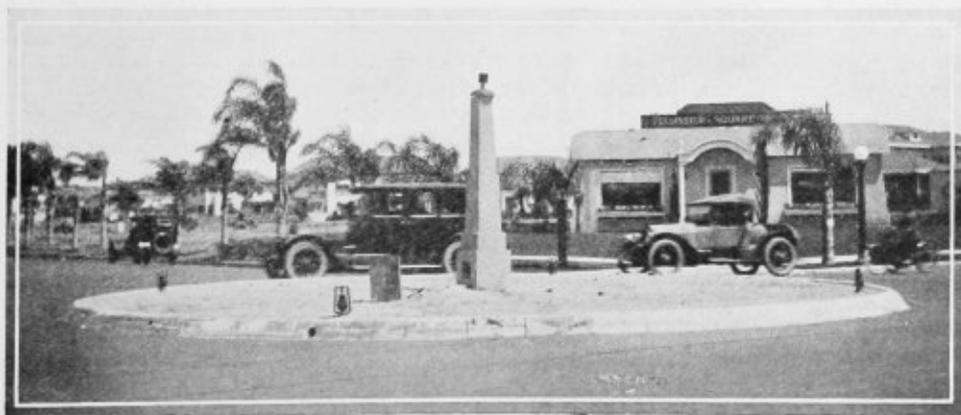


AN electric tire signaling device has been invented by Frank Bergier, Manhattan, Kansas. It is used in conjunction with demountable rim tires and its function is to warn the driver of the car of the deflation of a tire, so that it may be pumped up before the tire is cut and injured by the rim.

The device includes a flat-headed pin which projects slightly inward against the inflated inner tube, being held in this position normally by a coil spring. It contacts with a slidable member also supported by a spring and positioned in the felly. This second movable pin on being depressed completes an electric circuit which either sounds a bell or lights a warning electric light. The wires for the circuit are led through a spoke of one of the rear wheels of a car. This signaling device warns the driver before any damage can occur.



THE Los Angeles City Engineer has removed the traffic guiding circle illustrated below. It was found that the circle restricted the width of the roadway and loomed as a fixed obstruction on the boulevard, which might make the city or some of its administrative officers liable for damages to vehicles or persons colliding with it. It was also believed by many that delay to traffic occurred when a large number of vehicles tried to cross the intersection in single file, as was necessary, and that this more than counterbalanced a possible reduction in the number of collisions. Two light systems were needed, making maintenance costs great.



Get More Mileage From Your Tires

"A Little Care Gives Longer Wear"

by J. E. McDOWELL

MOST tire manufacturers today are building automobile tires better than ever before. A more careful selection of raw materials coupled with thoroughly skilled tire makers enables them to manufacture tires which will give the car owner more mileage and less trouble than was dreamed of a few years ago—if they are given proper attention.

Under-inflation is no doubt responsible for more tire trouble than any other one thing. If a tire is run without sufficient air to support the load properly, the constant bending of the side walls at too sharp an angle will break the cords or fabric. Also, the excessive stretching and heating will soften the rubber cement and the tread will loosen from the carcass. Front tires should ordinarily be inflated to between 16 and 18 pounds per inch of tire section and rear tires 17 to 20 pounds—the variation, of course, depending on the load carried. In addition to looking at your tires every day check the air pressure with a gage at least once every week.

Excessive wear on the tire tread is usually due to the wheel's being out of true or not running in a parallel line to the other wheels. Turning into gutters, hitting curbs or bad holes in the road, and other excessive strains are likely to cause "wobbly" wheels or misalignment. The wheels will then travel with a skid-

ding motion which will wear the treads very rapidly. The rear wheels should run in parallel lines—that is, the wood felines should be the same distance apart in front of and behind the axle. The wood felines of the front wheels should be approximately $\frac{3}{8}$ of an inch closer together in front of the axle than behind it.

If your wheels "wobble" or do not run true, have a mechanic determine the cause and make necessary repairs immediately. It may mean worn out or broken hub bearings which could easily cause an accident. Whenever a tire wears faster than it should it is always a safe plan to have an expert examine the wheels, axles, and bearings carefully. This is especially true if the tread of the tire is rough as if it had been scraped with a coarse file.

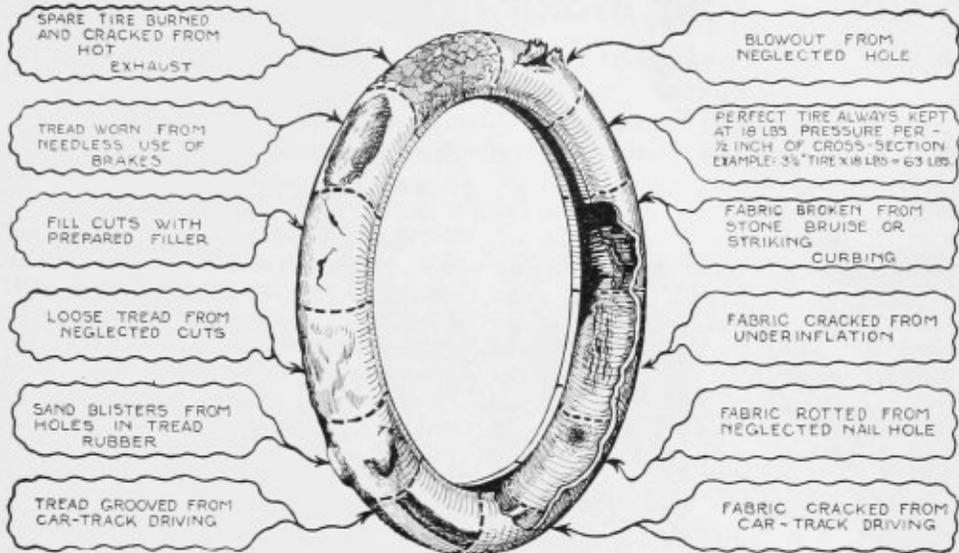
Be sure that the life of a tire will be cut short if punctures, cuts, and snags are neglected.

The elasticity of the rubber permits a cut to expand under the pressure of the weight of the car and sand, pebbles and dirt will be forced in. This accumulation of foreign matter acts as a wedge and with each revolution of the wheel is forced farther between the tread and the fabric of the tire. This may in time cause a complete separation of the tread. Small cuts should be repaired at once with the aid of tire putty. Vulcanize large cuts.

Fabric breaks may be caused by driv-



Misalignment, Locking Brakes, Wobbling Wheels and Careless Clutch Pedaling Ruins Many Tires



ing at a considerable speed over stones, holes, or ruts in the roadway or by striking the curb with force when turning around. A fabric break may not be noticeable on the outside of the tire but should show on the inside. Examine the inside of the casing carefully every time a tire is changed and if any roughness or break in the fabric is apparent have it repaired. A temporary repair may be made by using a rim cut patch or shoe.

Tires are very often badly injured by starting or stopping jerkily or too quickly and by fast driving on sharp curves, which usually causes the rear wheels to slide or skid sideways. This will grind off the tread and develop a condition exactly like the "flat wheel" of a street car. Probably more damage is done to tires, however, by unevenly balanced brakes, for one wheel will then take most of the strain of stopping the car. When making a quick stop that wheel will always lock and slide with the usual bad results to the tread as well as throwing an excessive strain on the tire fabric. Watch your brakes and have them tested for balance at regular intervals.

Some further suggestions to aid in getting better tire mileage may be summed up in a few words:

Avoid ruts and scraping curbstones and save the side walls of the tires.

Do not drive in car tracks.

Do not allow grease or oil to stay on a

tire—clean it off at once with gasoline as oil will soften the rubber.

Keep the rims painted and free from rust.

Keep all cuts in the tread rubber well filled so that water cannot enter and damage the fabric.

Keep spare tires covered.

Apply chains loosely enough to allow them to "creep."

Do not allow hot exhaust gas to strike the tire or back the car too close to steam pipes in the garage.

Change the air in the tires twice each season as stale air has a deteriorating effect on the tube.

Use enough talc in the casing to lubricate the tube but not enough to accumulate in one place and "burn" the tube or to set and harden in cakes.

Carry spare tubes in a bag to avoid chafing.

Have tires big enough to carry the load.

Do not store extra tires too long.

Do not store tires in too light a place.

One of the most important points to remember is that the fabric must be protected as it is the backbone of the tire.

Carelessness on the automobile owner's part has led many manufacturers to abandon the definite mileage guarantee. But the quality is there, in most cases, and with just a little care and attention real tire service can be had.

Rescue Your Motor from the Dirt Demon

Is Your Motor Wearing Out Very Quickly? Do the Bearings Knock and the Pistons Hiss Protestingly at Conditions Under Which They Work? Do You Know the Remedy? Here Is a Logical and Practical Advance Idea for Greater Service

by LOUIS J. BECKER

THE amount of dirt, sand and grit that passes through the radiator of an automobile and into the space under the hood would no doubt fill a fair-sized barrel every season. If gathered together in one heap it would no doubt make an astonishing pile. It sweeps in through the radiator and over the motor continuously. Luckily, a great deal of it passes away with the current of air that swings out under the floor boards. A considerable portion of it settles on the motor, as can be attested by the grit and soil-coated appearance of its outer surface, concealed beneath painted hoods. A quantity settles on the motor side of the dashboard and some on the under side of the hood itself.

Have you ever considered what amount of this damaging material is sucked into the engine by the continuous suction of the air intake at the carburetor? It stands to reason that on account of the drawing suction of that intake a great amount of dirt and grit is drawn into the cylinders in the course of a season. It is strange that engineers have not given this phase of the shortening of the life of automobile engines more thought. It is a positive fact that no one would consider for a moment the act of deliberately pouring a spoonful of sand into the carburetor intake to be absorbed and drawn into the cylinders of the engine, and yet this is what happens time and again during a few months' driving.

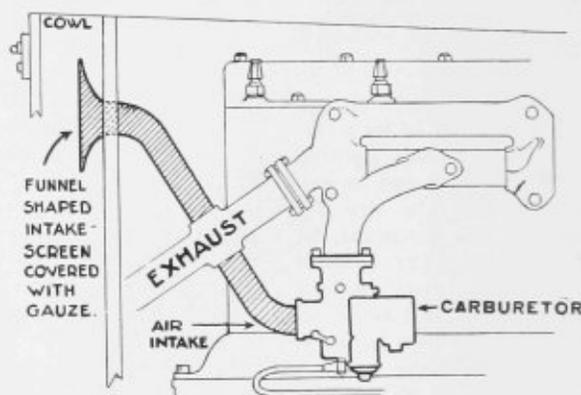
Other parts of the modern motor are well encased and protected from the stream of grit. Valve stems and guides have been covered with enclosures. Rocker arms are protected with dust-proof casings. Gears, flywheels and clutches are enclosed. But in the vast majority of cases the motor is allowed to suck grit into the very heart of the engine—to be rasped up and down the

sides of the cylinder walls and wear away the pistons and the rings; to get down into the crank-case and then between the bearings to proceed on the same destructive course.

Is not here a viewpoint for an automobile economy that has been over-

looked by some zealous seekers for long-life service in automobile engines? Does not this point deserve careful weighing and consideration? Probably it has been simply taken for granted that here was an existing situation which could not be remedied; that it was a condition of motor operation which had to exist simply because of natural elements which could not be changed. The difficulty, however, can be remedied. If the carburetor air intake is piped to a location on the car where there is the least dust—such as inside the car under the cowl or under the instrument board—and the pipe is spread to a wide funnel shape and covered with a screen which in turn is spread with a removable layer of cloth gauze, the problem will be solved.

The gauze will strain all the air taken

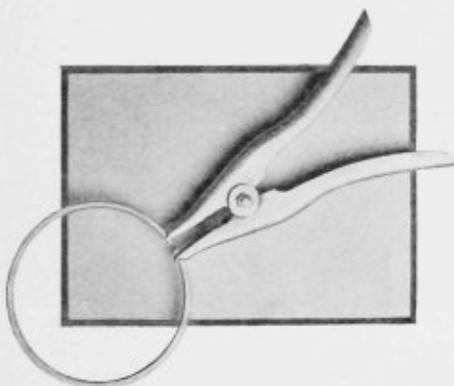


Your Engine Will Run a Good Deal Better and Longer if It Is Given This Protection

into the engine and will filter out all injurious substances. The soil and grit will be caught upon the surface of the gauze, which should be clipped on with a wire ring so that it can easily be removed and washed. A few extra gauzes might be carried in the tool box and replaced every few weeks, or whenever necessary. The consequence of using this attachment would be that the engine would be fed only filtered air and that the engine "innards" would be kept scrupulously clean with the natural result of a sweet-running motor, smooth operation and long, serviceable life.

Still Another Piston Ring Tool

A NEW piston ring tool for placing piston rings in position on the piston of an engine and to facilitate the removing of the ring from the piston has been invented by Elmer J. Rogers of Quincy, Mass. The device consists of a pair of levers pivoted together and terminating in opposite small outwardly facing prongs having grooves on their outer edges of suitable size to engage the free edges of the split ends of the piston ring. Pressure on the handle above the pliers will spread the prongs apart and



A Spring Bearing on the Handles of the Pliers Normally Holds the Operating Prongs in Contact in Closed Position

increase the diameter of the ring so that it may be readily slid over the piston to put it in place or to remove it.

A tool of this sort will prevent the skinning of fingers which is so common when rings are removed or replaced by hand. The tools are made of steel.

Jack Up the Rear Wheel and Pump Up the Tire

STANTON H. PRICE, of Chelais, Washington, makes his automobile pump its own tires. This is done by jacking up the rear wheel and securing to it an attachment which operates a tire pump



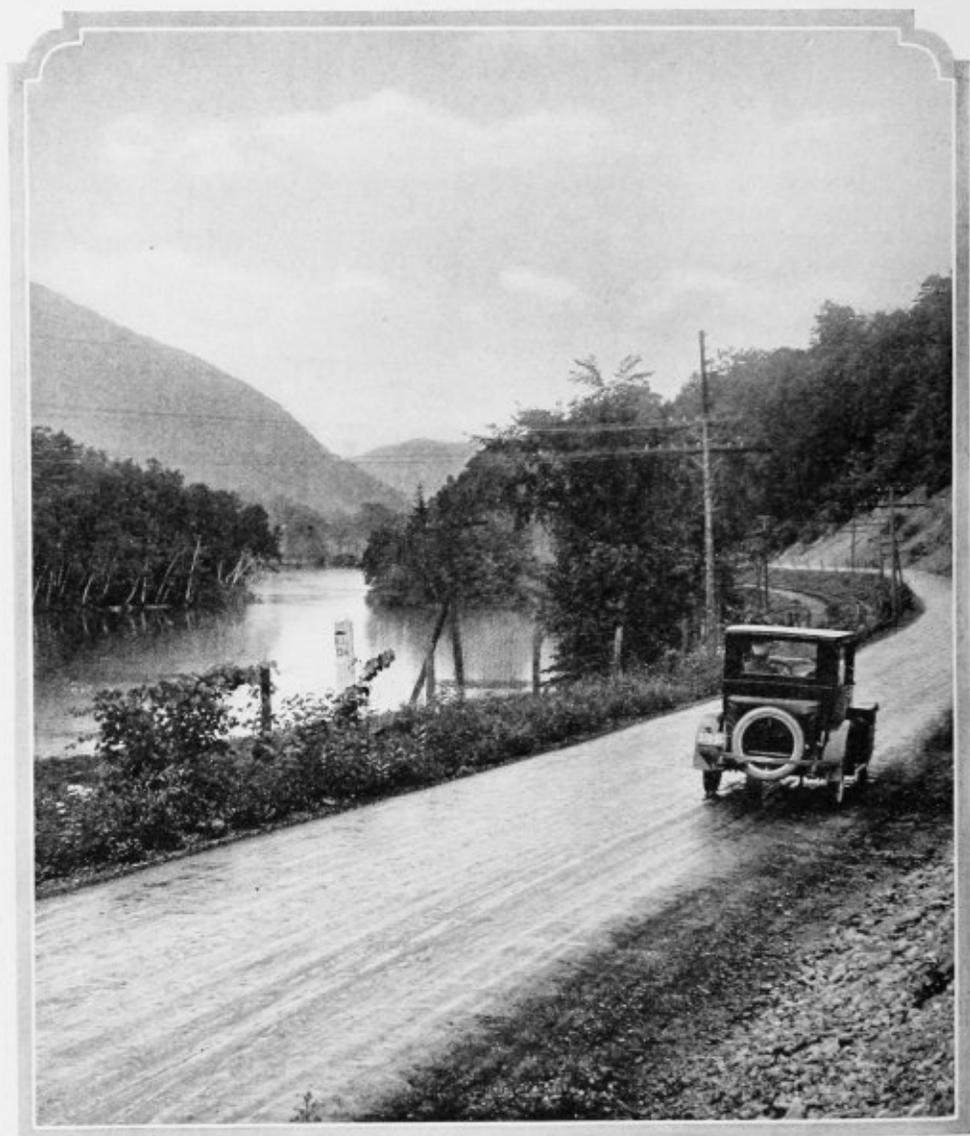
The Turning Motion of the Wheel Actuates the Piston Rod of the Pump and Spares Manual Pumping

that is clamped to the running board. The pump has a transverse handle which is engaged by a separable clamp having a T-shaped socket. The means for operating the pump include a pitman and a substantial universal connection between the pitman and the clamp. The pitman has its driven end attached to a crank affixed to the rear wheel of the automobile, near the hub. The universal joint is of the well-known ball-and-socket type. The entire operation of jacking up the rear wheel, starting the engine and pumping up the tire with this automobile-operated pump requires less than five minutes.

Filling Gasoline Lantern at Gas Stations

AUTOMOBILE tourists are making considerable use now of a popular make of gasoline lantern for lighting up their camps after dark. It throws a brilliant light and is almost indispensable, but the filling problem is a bugbear. It usually means carrying a bottle of gas somewhere about the car, and this is more or less dangerous and bothersome. The writer filled his lantern as follows:

Each day when stopping for gas at filling station the pint or more left in the filling hose was drained into the lantern instead of into the car tank. This did both jobs at once.



APRIL DAYS

by FLORENCE R. PAESSLER

*Comes April in our welcome midst,
Her eyes of crocus-blue a-smile,
And glist'ning dewdrops all the while
A-trembling on her lashes.
She tosses back her Spring-gold hair
And sunlight dapples all the dale;
Bird choristers fill every vale;
The wind soft stirs her sashes.*

*She wafts her scarf of rain—a charm,
Spring flowers peep above the mold
And bees start gathering their gold,
While frogs commence rehearsal.
The winding brooks are symphonies;
Cicadas tune each violin;
The tree-frogs pipe a welcome din,
And joy reigns universal.*



COURTESY DENVER TOURIST BUREAU

Loveland Pass Road on the Way to the Mount of the Holy Cross, West of the Denver National Park System. Feeding Chipmunk at Estes Park, Colo. A Tame Woodchuck at Canyon Camp, Yellowstone Park

MILADY AND THE MOTOR

WOMEN are quick to appreciate new forms of enjoyment, so this year many more of them will experience the keenest joys of the motor tour. Last year large numbers made such trips, but the approaching season will swell the multitude. Happy groups will cruise the country, seeking scenic

beauty and adventure in the great outdoors that stands always ready to welcome with an inviting splendor. The kinship of the open places will sweep away traces of conventions and draw strangers into closer unity—into a companionship and friendly feeling which will form thousands of friendships.

HELPS FOR THE HOUSEWIFE



Left — Metal freezer does work quickly, can be put in ice box
Below — Plug lowers switch so it may be reached by short persons



Center — Folding safety ladder has iron hand rails. Makers claim that this ladder cannot upset



Rapid comb cleaner makes use of a revolving bristle brush. It rolls over the comb and between the teeth. Brush is removable for sterilizing



Above — Electric table cooker boils eggs without water, toasts both sides of bread at once and fries or shirs eggs while toasting

Below — Household drain pump clears pipes



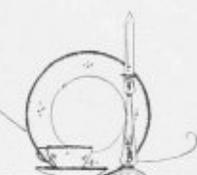
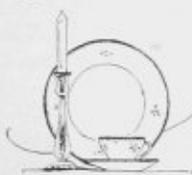
This is a combination stand for home sewing-table, card table and for use when typewriting. The top is of wood and the pedestal of metal



Pan scraper has handle and three corners with edges that keep sharp

Right — Glass stove leg prevents floor damage and makes cleaning easy





CUTTING DOWN THE SOAP BILL

Do You Seem to Be Using More Soap Than Necessary? Do You Know the Reason? Are You Acquainted with the Various Water Softeners Which Effect Economy and Better Cleaning? Good Methods Are Presented in This Article

by MARY ELIZABETH ALLEN

SOME economical soul has calculated that two ounces of soap are wasted for every grain of hardness in each one hundred gallons of water that housewives use for washing. But this waste of soap is not the worst, for the minerals from hard water are deposited in the meshes of the fabrics, and white clothes take on a grayish, dingy appearance; while that insoluble curd or scum, which laundresses call "lime soap," streaks the garments and often settles in the hems and tucks making rewashing necessary. If it dries in the clothes it stiffens the fibers, and ultimately causes them to break where folded.

We say the hardness of water is "temporary" or "permanent" according to the particular kind of minerals it contains. If your teakettle is incrustated inside with a layer of scales, you may know that the water is "temporarily" hard. That is, it can be "boiled out." When the minerals occur in forms that are not affected by boiling, the hardness is said to be "permanent" and can be removed only by the use of some such reagent as soap, soda or ammonia.

Both temporary and permanent hardness are usually present together and, if either one is allowed to remain, it is just as bad as the other for laundry purposes. The reagents most commonly used are washing soda, borax, ammonia, lime and soda lye.

A chemist can, however, by knowing the exact degree of hardness in the water, calculate the precise amount of chemicals to use to get the maximum softening effect without any resulting injury. The local water department can usually tell you the nature and degree of hardness in the water, indicate the right reagent, and



Putting in Too Little of a Softener Will Result in Not Completely Softened Water. An Overdose Will Leave Dangerous Chemicals in Solution

just the correct proportion to use in softening. When such information cannot be had, you will have to resort to some good general rule for softening average water.

Washing soda is the commonest and cheapest softener that you can use. The chief objection to washing soda as a softener is that only a certain amount can be utilized in softening the water. If too

much is used, the excess simply stays in the water and is extremely injurious to the hands and to the clothes, especially such fabrics as wool, silk or linen. However, if only the correct amount of washing soda is used, none is left in the water. It is

throwing it in "by the handfuls" that does the damage. Two ounces of washing soda for a large tub of water are the most that should ever be used. It must be remembered that while washing soda removes permanent hardness by precipitating carbonate of lime, it has no effect on temporary hardness.

Borax as a water softener has the advantage that using too great a quantity is not so dangerous as using too much washing soda. But it is too expensive and too ineffective to employ as a softening agent on any considerable scale. However, it may be used economically and with good results when only small doses are required, especially when it is suspected that there is iron present in the water. For the hardest water, one-fourth of a pound of borax to a large tubful is about right; most waters, however, do not need that much.

Ammonia is better than either borax or washing soda, because the ammonia is volatile, and does not leave any residue to act on the clothes. It is especially valuable in washing woolen goods or materials likely to shrink. As ammonia vaporizes readily it should not be poured directly into hot water, but should be added to a small quantity of cold water, before pouring into the tub. You save your eyes and nose, as well as the am-

monia, this way. There is no need of inhaling strong ammonia fumes.

Waters vary so in composition that a softener which proves best for one may not be suitable for another. A combined dose of both lime and soda will effect the softening of most waters. There are few hard waters that will not yield to their combined reaction. The lime re-

moves the temporary hardness, and the soda the permanent. One ounce each of dry slaked lime and soda may be used to thirty gallons of average hard water. Many housewives claim that they get better results this way than by any other softening treatment.



Reagents Most Commonly Used Are Washing Soda, Borax, Ammonia, Lime and Soda Lye

It is always a doubtful and uneconomical practice for the housewife to purchase any unknown package-chemical for softening purposes. Make it a point to read the label, and to reject any package that does not give a statement of the ingredients.

Success in softening water will vary with the temperature of the water, how thoroughly it is mixed, and the sedimentation. The hotter the water, the more rapid and complete will be the precipitation. Thorough mixing gets the best reaction in the shortest time. The more the mixture is stirred, the longer the chemical is kept in suspension, the more complete will be the softening.

No hard water can ever be made as soft as rain water. But the results are ample to justify the bother. Our laundries no longer use hard water, for they realize that money is wasted, and that poor work results from the curd that forms. Even when you don't know much about the nature of the hardness of the water, the average treatment will be worth while.

When the water is hard, don't use twice as much soap to get a lather, but add washing soda, borax, or ammonia to effect a softening of the water—and you will save money on soap bills!

COFFEE CAUTIONS

by KATE M. HUNTING

THERE should be no argument over the fact that some people's coffee, not mentioning any names, is literally a caution. The New Jersey woman whose head was the target for her husband's morning cup of coffee will be

more cautious in the preparation of this beverage, if she ever again takes unto herself a husband. The cup that cheers at the breakfast table is brewed from the coffee bean, and it is the inalienable right of every man, (also woman) to have his or her "appetite juices" stirred into action by a delicious taste. This, say authorities, correctly made coffee will do. In further substantiation that good coffee should not harm us, we quote

from Professor Hollingsworth of Columbia University who says, "Exhaustive research proves that coffee well prepared has strengthening influence on mind and muscles." You may have been getting more of the unhealthful parts of coffee than the healthful if it does not agree with you.

There is but one correct way to produce good coffee. There are four wrong ways. The first wrong way is by boiling in the old-fashioned coffee pot. We are told by chemists and biologists that the continuous boiling of water extracts from coffee an excess of acids and insoluble fats. If you make coffee this way, look in the bottom of the coffee pot some time and you will discover for yourself a sediment of a scummy nature. Coffee standing for thirty minutes or even less time in a metal coffee pot is greatly changed by chemical action. Such coffee is said to be unfit to drink. Percolator

coffee is made under practically similar conditions. If brewed in a bag or tied in a rag, the result is merely strained coffee with a chemical scum at the bottom of the pot.

The real way—and the right one—is the dripping and filtering process, which makes the ready-to-drink coffee fall into a glazed earthenware container. This prevents the possibility of a formation or deposit on the metal, which is now believed by chemists to be a chemical combination of some coffee ingredient and the metal itself. Perhaps the infuriated New Jersey husband was not to blame after all. He may have been drinking a chemical combination to cheer him at the breakfast table.

One of the new coffee-making methods accomplishes three filterings at once through paper-covered metal into a china coffee pot. The coffee pot illustrated here is one of the new tricolators that operates in this way. Its base is vitrified china with an aluminum section fitting over the top to filter and tricolate boiling water through pulverized coffee. With a finely perforated bottom, over which a filter paper is placed in addition to two other perforated disks, three filterings are provided which remove injurious substances. The coffee is placed in the first paper-covered disk next to the top of the pot. Only the aromatic, healthful part of the bean reaches the beverage you drink. A coffee infusion results that is hot, exceptionally clear, and pleasing to the taste. It is said to aid digestion and gently stimulate the system. The ground coffee is immersed too short a time to ex-

There Is But One
Correct Way to Make
Good Coffee. That
Refreshing Beverage
Relished by Nearly
Everyone



tract a bitter acid—a taste frequently referred to as “sour,” giving a sharp bite to the tongue. In this newer method, the water and *not* the coffee is boiled.

It is stated by an eastern coffee expert that he is ashamed of the average American cup of coffee. The other day, for the first time in history, this gentleman told, by Radio, two hundred thousand people how to make good coffee, and incidentally to keep husbands happy. One of his important points, other than the method employed for brewing, was this: A better cup and a cheaper one can be produced with a little more intelligent buying. Buy in the bean, we were told; otherwise we buy with our eyes shut.

If we buy in the bean, we must have bean knowledge, which does not come to anyone at once. We can, however, select a good brand, buy from a reliable

dealer and grind our own coffee. When buying coffee remember you pay for the flavor.

The cooking of coffee has been done in the roasting, whose color degrees mean rare, medium, and well done. No amount of additional cooking can ever produce that rare aroma and taste given off by a real cup of coffee. This new method may seem quite revolutionary to some of

us, but it is up to the women to improve the American cup of coffee, since it is frequently claimed to be the cause of domestic infelicity.

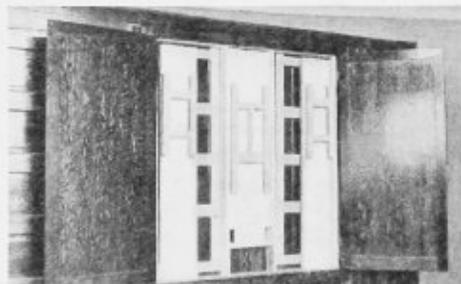
So now you have the gist of the coffee situation. Perhaps “chemical coffee” does not apply to your style of making the beverage but, nevertheless, it is well that this new knowledge

concerning it should be disseminated. To do so cannot but have a beneficial effect for we have been negligent as to coffee.



The Tricolorator Does Not Have Filter Paper
But Muslin Cloth

A Built-in Folding Breakfast Table



The Table and Benches Fold into a Wall Case

THE built-in folding breakfast table illustrated above can be collapsed completely and folded into a small cupboard in the wall when not in use. It was invented by Willis D. Perry and W. P. Ballard of Portland, Oregon.

The main leaf of the table is hinged to the wall and has legs hinged to its outer end. It also has opposite leaves which may be folded under the main leaf or lifted into alignment with it so as to form the complete table top, ready for use. Folding benches are a part of the equip-

ment, the benches having a construction similar to that of the table but with the addition of folding backs.

The idea is particularly applicable in small homes or rooms where space is limited. In a nursery the set is splendid, because it can be folded out of the way after the children have eaten.

The outfit is one that will also appeal to those who need space or an occasional extra table.



The Table Can Be Quickly Let Down for Service

HOW TO SAVE MONEY WHEN SHOPPING

"What Do You Call This Shoe?"

The Shopper May Have a Very Definite Idea of What She Wants in the Way of Shoes and Yet Be Unable to Find Them Because She Does Not Know How to Ask for Them Correctly. It Is Confusing to Have the Salesman Ask "Kid or Calf?" and "French Kid or Vici?" When One Does Not Know the Appearance of These Products

by MRS. HARLAN H. ALLEN

Kidskin is a very lightweight leather. It is comfortable to wear because it has a greater amount of stretch than any other leather. Kidskin is not so durable as calf because it scuffs more readily, but it is dressier. People with very tender feet generally claim it is the easiest of all leathers on the feet. The term "kidskin" has nothing to do with the quality, and it is applied alike to all kid and goatskin. You can gage the grade somewhat by the appearance of the pores. In the very finest grades the pores are hardly visible.

"Will this patent leather crack?" is perhaps the one question heard oftener than any other from women shoppers in the shoe store. The smooth, glossy, black surface characteristic of patent leather is made by treating dry, softened skins with successive coats of varnish and baking after each application of varnish. Large, thin, firm hides are generally selected in the first place. The varnish is made of gums and vegetable oils and each coat is worked into the fiber and thoroughly dried before the next is given. The last coat is applied with a brush and the leather baked for three days in an oven at low temperature, then finally exposed to the sunlight, which oxidizes the varnish and gives the finish.

When the customer begins to wear the shoe and the leather expands, as it frequently does when affected by the warmth and moisture of the foot, the coating of varnish, which is inelastic and cannot expand with the leather, may crack. No manufacturer can tell whether the leather is going to crack or not and for that reason it is seldom guaranteed. It does, however, frequently give good service.

The finish is a very popular one, being especially suitable for semi-dress wear, but appropriate for almost any other occasion as well. This handsome leather brings out the lines of the shoe to the best advantage and no polishing is necessary. The varnish is also an effective waterproofing.

Patent leather may be made from kid, colt, calf, and cowhide. Coltskin, because of its firm, solid texture, is said to make the most satisfactory of all patent leathers. Patent leather was made in the United States as early as 1818, but only recently attained its present excellence.

Calfskin is one of the best leathers for a practical everyday shoe. We usually think of it as heavier than kid, but it comes in all weights, from very light to heavy. It resists water and does not scuff so easily as other leathers. It is easy to keep a calfskin shoe in good condition, because it can be given either a high polish or a dull velvety finish. This shoe is not so pliable, but for that very reason it holds its shape better under hard walking.

It is very difficult to judge the quality of a cloth shoe. If the shoe is a high-grade line, put out by a reliable house, you are safe in assuming that the cloth is of good quality. A cloth shoe will not always wear as well as a good leather, but one of quality ought to give service. It cannot, of course, be polished and kept in shape as easily as leather can. You can generally tell a very poor quality of cloth shoe by the "cottony" look. Canvas shoes are light, cool, easily cleaned, and not so expensive as leather, so are general favorites for summer wear when such shoes are desirable.



COURTESY H. H. BIRDSONG CO.



Modern Home Decoration

Artistic Treatment of Interiors and Furnishings

by ODA ALEXANDER



THE lower hallway is the room which usually gives the visitor a first impression of the residents. If things are awry, out of place, or the decorations in poor taste, that impression of the hostess is given the visitor. If the general unity of the decorations is gloomy, dark and depressing, that effect is thrust upon the one entering. But if the hallway is bright and cheerful, light in tone, spick and span and inviting, the visitor is at once favorably affected.

The hall should for these reasons receive first attention, for it is like the handshake or smile that you give to your friends on meeting. Since the recent rage of bright and lively colors, as distinguished from the previous black-and-whites and the more recent grays, it is well to introduce some element of it. This should not stand forth as a garish display but rather as a symbol of a happier attitude towards everyone and of the approaching better times.

Life does not lie in drab stagnation, but in movement. Though you may

hesitate to introduce a dominant and emphatic hue, safety lies in this course because stimulation and interest is there. It is interesting to watch the effect of a colorful decorative scheme upon those who see it when complete. Almost invariably it results in a pleased look and happy exclamation. And, though it takes courage to introduce what standing alone seems a glaring, screaming, shade, when introduced with its complements in reduced tones, it beams forth with a brilliant note.

The casting off of drab tones is certain to be continued for, once having reveled in the cheering company of brighter colors, drabness will not be tolerated. While it is not desirable to have the wall space decorated in too-bright hues, the colors may find their places at the windows, in the furniture, carpets or ornaments. Splotches of high color here and there are sure to introduce a new element of interest.

Therefore, watch your hall—give it a note of cheer and welcome.



Delightfully Planned House with Steep Roof

by CHARLES ALMA BYERS

THE little house illustrated above has a decidedly attractive exterior and a well-planned interior. It is also of practical design both inside and outside, and surely constitutes a little home of which almost anyone might justly feel proud.

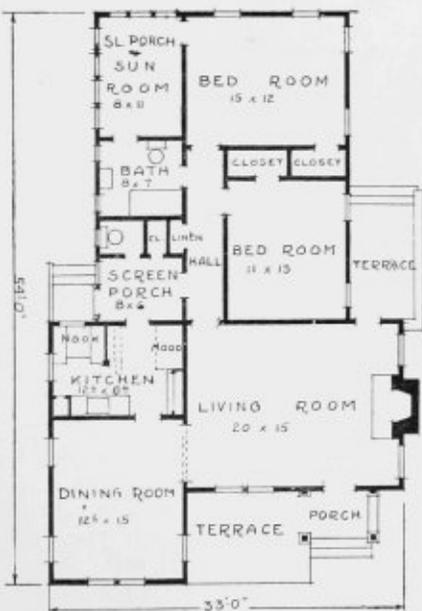
The very steep roof, with its peak ornamentations and its every fourth course of shingles effectively doubled, contributes particular charm. The outside color scheme includes the walls of gray cement-stucco, over frame construction, and the roof of wood shingles painted brick red. The principal trimming is dark brown, but the window sashes are white. A special little entrance porch is a feature of the front, and immediately adjoining it is a small open terrace. There is also a little corner terrace on one side. Both of these terraces, as well as the entrance porch, are floored with ce-

ment. The chimney is constructed of brick and surfaced with stucco, and the house foundation is of concrete.

From the floor plans, it will be seen that the front door opens directly into the living room, and that the little side terrace is also accessible from this room. The dining room is joined to the living room by a broad cased opening.

From a rear corner of the living room a hall extends to the two bedrooms, the bathroom and the kitchen-entry porch.

Features deserving special notice are the little sleeping porch on a rear corner and the special Pullman breakfast nook in a corner of the kitchen. The former, accessible from both the back bedroom and the bathroom, has two outside walls given over almost entirely to windows, and is so located as to receive the early morning sunlight. It, therefore, is always pleasant.



A NEW KIND OF PLOW

This Farm Implement Plows, Disks and Harrows

by OLIVER S. ARATA



This Rotary Agricultural Tool Is a Development of the Idea That Fathered the Cable Layers Used in the World War on the Fighting Fields of France

At last there is something "new under the sun." The something new is a plow. Although the principle of the plow is very old, it has been improved upon to such an extent that it can justly be called a new invention.

Instead of the sharp point that dug into the ground for ages the new plow is constructed along entirely different lines. It does more work for neither harrowing nor disking is necessary when you use this plow.

Lytle Adams is an inventor by instinct and a farmer by profession. One good thing that has come out of the great World War is this new plow. He designed the cable layer that laid cables in trenches in France. It was from the cable layer that he derived his idea.

The plow is triangular in shape and made of channel steel. There are nine vertical shafts which project downward. Upon the ends of these shafts are revolving spiral disks which are, in reality, the plows.

The cutters, or plows, may be lowered by a handwheel to any required depth, either above or below the ground. They are constantly revolved by a gasoline engine above and upon the plow. The entire machine can be drawn by a tractor or by six horses. The apex of the frame points forward. All cutting disks or plows revolve in such a manner that the tracks of the cutters overlap in the forward progress of the plow.

Shafts and cutters rotate in opposite directions. Thus, all obstacles such as rocks, roots, etc., are removed easily and at the forward movement of the plow.

Every time the plow invented by Adams passes over the earth, it plows a strip of ground 11 feet in width, thus gaining 9 feet over the old method.

The handwheels on three angles permit the worker on the plow to adjust the cutters from 1 to 16 inches of plowing depth. The cutters only strike objects superficially and not solidly, according to the inventor.

The back cutters always remove the tracks in plowing when the new plow is used. Disking and harrowing are unnecessary. Only one man is needed to drive the tractor or horses. The gas feed and speed of the motor are regulated by a governor upon the plow proper.

With the new plow from thirty to forty acres can be plowed in one day. When the plow has finished a field, the ground actually looks like someone has raked it with a fine rake. The land is then ready for seeding.

The plow does two things: It prevents a so-called "mattress" of vegetation from being turned over and then under, and thus allows a free circulation of air; it distributes all nitrogen found in vegetable life equally when plowing. All sod is pulverized and mixed thoroughly with the soil. Where dry farming is necessary, the plow will be equally useful.

Two Motor Trucks Haul 92-Foot Poles

THE accompanying photos show how two motor trucks were used in hauling 92-foot poles on the Pit River Project of the Pacific Gas and Electric Company in California.

The arrangement worked well. The only extra equipment necessary was a powerful siren on each truck.

With these sirens the truck drivers signaled each other in a special code for various movements. The poles were hauled a good distance over rough country very successfully.

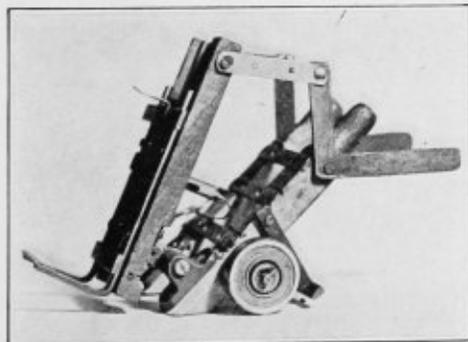
Especial care was called for when the poles were transported through the forest. Since the logs were pivoted quite a distance from the ends, they made a wide sweep when being turned. The success with which the venture was handled reflected credit upon the truck drivers.

A HAND truck has been designed to enable one man to move large packages, thus doing away with the services of a helper. A platform is placed above the wheels and handles so that it may be raised or lowered by double leverage, making loading and unloading much easier than with an ordinary truck. A



hook attached to a wire cable is fastened to the platform and when placed on a case and the levers lowered the box may be readily loaded. A metal bar is so adjusted behind the wheels that it forms an effective block holding the wheels in place while cases are being moved onto the truck.

SPIRAL wire springs have recently been perfected to hold tennis balls securely to the racket for carrying. The device enables those who do not use



A Spiral Wire Spring Holds the Tennis Balls Securely to the Racket and Thus Offers a Convenience That is Certain to Be Popular

racket cases or covers and those who do not have pockets in the racket covers for the carrying of balls to carry the balls to and from the tennis court without having to use either their pockets or their hands for holding the balls.

THE BOYS' WORLD IN PICTURES



Leonard Martensen, 13, son of an Arctic fur buyer whose ship was captured by bandits, was rescued in the Siberian wilds



Manual training is one of the most popular periods of the school hours as the boys make standard furniture



This is what happened in Central Park, New York, when a movie concern turned loose a greased pig

This real little automobile is the property of an English boy who attracts much attention in it



Radio is always present with the boys. These boys took a set along on a winter hike



THE BOY AND THE BICYCLE

by H. M. LEWIS

PRACTICALLY every boy at some time of his life wants a bicycle. The bicycle desire crops up after the boy's graduation from the small wagon period. With the little wagon he was limited to the neighborhood, playing with the youths of the immediate locality. As he grows older, his field of activity expands—he finds the dragging wagon is too slow for him, and begins to wish for a bicycle. After that, he is not satisfied until he owns one.

Some boys are too self-reliant to ask their fathers for bicycles. They go out selling newspapers, doing errands, or working at odd jobs for the merchants of the vicinity. The time spent in earning money to buy a bike is often one of the most interesting times of a boy's life, for each time he gets a little nearer to the total price of the machine, he gets an exultant thrill. On the day when the complete amount has been saved, he is so brimming over with enthusiasm and delight that he wants to buy the shiniest, the speediest and the best bicycle in the world.

On the day that the bicycle is delivered, that is the greatest day of all, and the wonderful time that he has showing the new wheel to his boy friends and the opportunity he has to ride like a conquering hero past the window of the little girl of the white dress who lives nearby,

exceeds all previous. Proudly does he ride past her window.

The bicycle is the boy's first piece of actually practical mechanism. In taking care of it he learns many mechanical things and is taught to appreciate that if anything is to give good service it must be well cared for. He learns the mysteries of the coaster brake and the ball bearing. He comes to understand what gearing means. About sprockets, rims, spokes and tires he is soon adept and all the new things he learns will stand him in good stead when he grows up.

The fact is, a boy feels like a man when he has earned the price of his wheel and is able to make the repairs and to earn money besides by equipping his bike with a delivery basket or luggage rack and doing errands.

Eventually, some of the other boys of the neighborhood will get bicycles. They should get together and form a bicycle club. This is the real beginning of a wider field, for the number of roads that lead to woods, hills and brooks are unlimited. In these explorations through the open country, boys learn to depend upon themselves, to shoulder responsibilities and carry them.

A healthy life in the open air and vigorous exercise are exactly what boys delight in. The boy, the byway and the bicycle form a brim-full combination.

Interesting Things For Little Men

BUILT of wood, with complete equipment of lace and roller curtains, this little house is very interesting. It was used as a float in a parade in Califor-



nia. It is just large enough for the boy to crawl around in. The windows are 18 inches high and the door 3 feet high. The house is valued at five hundred dollars.

THE novelty of mechanical toys soon wears off and they are cast aside, but a motor is something that holds the interest all the year around. A mechanical toy does not often broaden and tax the ingenuity like an electric motor does. Really, a motor is not a toy but a piece of apparatus that has unlimited possibilities for the mental improvement of its owner.

The average boy likes to make things. He longs for a workbench and a few tools. When given an electric motor, he will study the mechanical principles of pulleys, belts and the parts of the motor itself much harder than if he had to get all this information from books. First-hand information fills him with a joy that leads to achievement.

He will not be content with merely running toy machinery but will construct workable lathes, grinders and drills that he will use. This will lead to the making of other things of a practical nature and his experience and knowledge will be

broadened further. Since most boys would rather devote their time to making things instead of reading, the small horsepower motor and the many attachments that can be used with it fit naturally into their desires and inclinations.

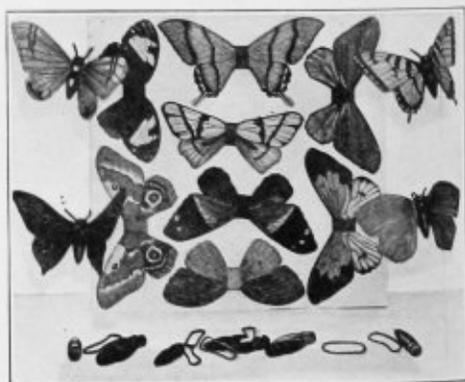
Boys will not turn ice-cream freezers very often if they have small motors. Old bicycle wheels, cogs and a pulley shaft will do it instead. In accomplishing this, they will glow with enthusiasm and feel that they are worth something in the home.

This education comprising the absorption of electrical fundamentals and the mechanical possibilities associated with them—which boys acquire quickly by using small motors—will be a starting point from which to build for future advances and attainments.



A HIGHLY educational pastime for boys, or even girls, is a new butterfly game now offered. Butterfly bodies are printed on paper sheets in colors which duplicate exactly those of nature.

When the butterflies are put together, the paper wings are slipped into slots on the wooden bodies provided. Rubber bands are then fastened on to furnish feelers.





YOUTHS REPRODUCE INDIAN ART

by EARLE V. HITCH

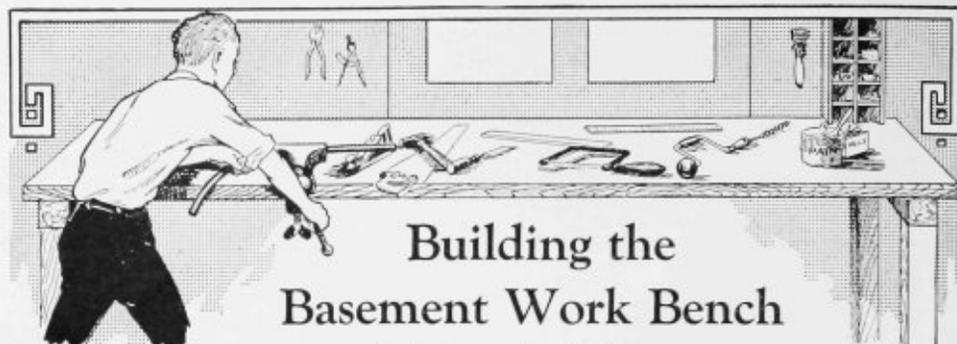
WITH no tools or materials other than those available to the Indians, whose work they copy, these woodcrafters fashioned objects which no good Hopi or Navajo would be ashamed to own. Basketry, weaving and pottery were the handicrafts taught and with surprising skill and dexterity these lads followed the inspirations of the savage creators. The boys, who range from ten to fourteen years old, displayed a patience and perseverance which would do credit to a master craftsman, and, though they yearned to see their work progress, their pride of workmanship never permitted them to call finished a work they considered inferior in quality or faulty in design.

Sharp rocks, sticks and scout knives were the only tools used in the process of pottery making. The clay was dug in the locality and molded by hand, as the American Indians knew nothing of the potter's wheel. The boys were allowed free range in the matters of proportion, symmetry and design, subject only to the influence of specimens of work done by the Indians themselves. The colors were all obtained from whatever Nature had at hand. The earthen pigments of ocher

and hematite supplied yellows and reds, and black was obtained from the juices of cultivated cactus and yucca plants. All of the firing was done in Navajo fashion; a pit was dug in a hillside, the pottery set in and the fire made over the top. The blaze was started with a pair of rubbing sticks.

The materials for basket making were gathered from wild growths in near-by fields and woodlands. Some artificial reeds were used. In basketry the workers had the same latitude as in the other crafts and were left to their own fancy and ingenuity. The decorations were done mostly in colors made from wild berries and barks garnered from trees and bushes by the boys themselves.

Belts and hatbands were most commonly made by the workers at the looms. For these articles common wrapping cords were used on the primitive looms like the Indians made from the forks of the willow tree. The most noteworthy piece of handicraft achieved was a reproduction of a Navajo blanket. This was woven so expertly that it held water. The woodcraft school is located on Lake Maxinkuckee, in northern Indiana, and is popular with all boys.



Building the Basement Work Bench

by JOE V. ROMIG

WHEN the boy tires of his mechanical toys and loses interest in his model builders, he is ready to graduate into the class of Amateur mechanics.

Boys then want to construct something by following the designs which they see in the mechanical magazines of today and from designs which they work out for themselves. In order for them to work there must be a workbench—the first necessity of any workshop. Materials of various sorts and an assortment of simple tools are also necessary.

The amateur's first conception of a workbench is one rather elaborate and usually out of his reach, but a very suitable and serviceable workbench can be made according to the plans given in this article.

The design is simple yet gives one a strong bench, with plenty of drawer and storage space. The lumber should be one inch thick, dressed on both sides, of good grade pine except for the top which should be of hard wood such as oak or maple—preferably maple.

The main part or cabinet body is made like a box and dimensions are given in the accompanying sketch. Cleats are nailed to the ends, as shown, which stiffen and strengthen the whole affair. A partition is placed in the center of the inside and nailed to the top, bottom and rear. Small cleats are nailed inside the two compartments to make the slides upon which the drawers rest.

The top of the workbench is built up as a separate unit and is later placed in position. Carefully select the boards of a suitable width for the top, using the best and clearest piece for the front

board. These top boards are screwed to the two lower cleats as shown, using wood screws, $1\frac{1}{2}$ inches long, countersinking for the heads. After the top has been completed, it is ready to mount on the cabinet. Care should be taken to have the rear of both cabinet and top come flush with one another. Fasten by using wood screws, which should screw through the top into the cleats on the top ends of the cabinet.

The cleats are just 1 inch longer than the width of the top of the bench, allowing the backboard of soft pine to rest on the cleats and to be screwed to the back edge of the rear board.

The backboard is a necessity and should never be omitted on any workbench. To the top of this backboard is screwed the tool slat, held away from the backboard by three spacers an inch thick, one at each end and one in the center. Partitions can be made in this tool rack by spacing finishing nails every two inches, driving them through the front slat and into the backboard but not so that they project through.

The legs are made out of 1-inch boards, 4 inches wide, the front legs being 36 inches long and the rear ones 46 inches long. The front legs are screwed to the side of the cabinet cleats and the rear legs to the rear corners as shown in the sketch.

Screwing these rear legs to the backboard as well as the cabinet makes the whole bench a stiff and rigid affair and permits the bench to be lag-screwed to a wall or studding very solidly. The bottoms, sides and back of the drawers for the cabinet part can be

made out of thin box lumber. A piece of $\frac{3}{4}$ -inch lumber should be used for the front panel.

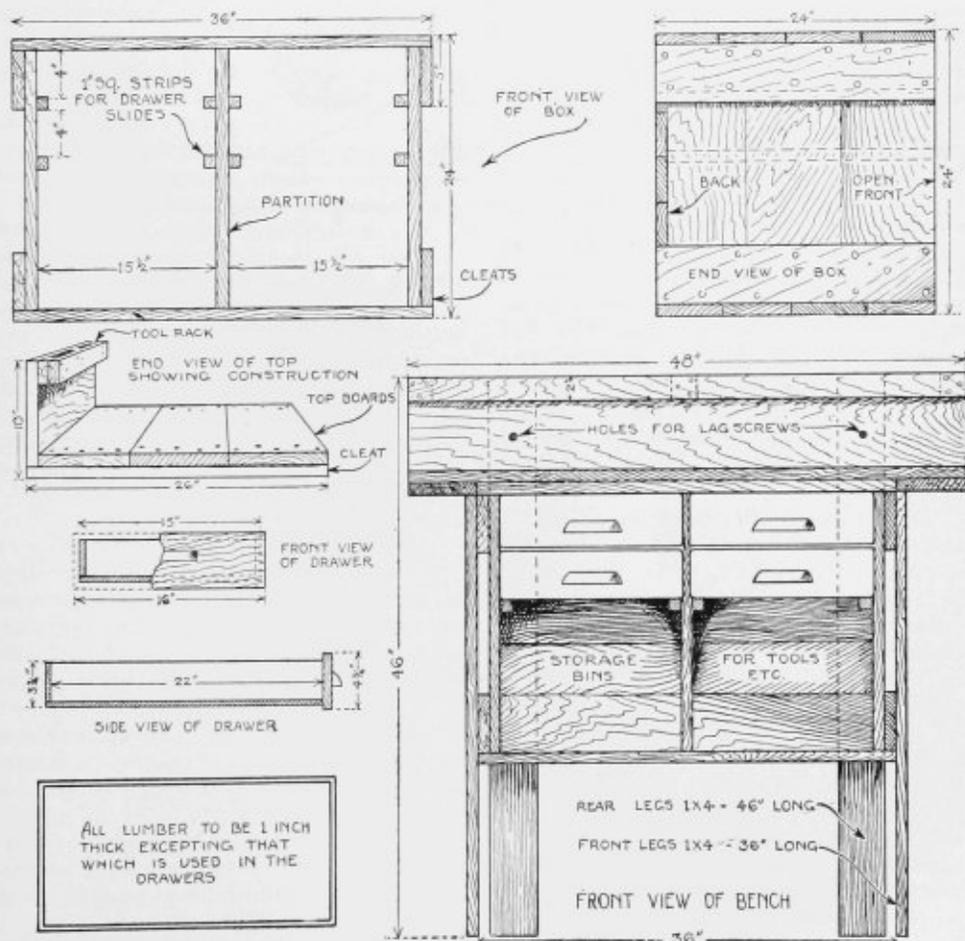
Drawers made to the dimensions given in the sketch will open and close freely. Never make tight-fitting drawers. Trouble will always result when they swell on damp or wet days. Drawer pulls can be fitted; the type made of stamped and pressed steel are the most suitable. Always remember that soap smeared to the sliding surfaces of drawers will make them slide easily.

A word as to the proper location of the work bench and the shop will be timely. The basement, an outhouse or a small room on the top floor or attic may be selected. For privacy and all around suitableness, choose the basement. Here one can work without dis-

turbing anybody in the house. The basement should always be dry and well lighted and the bench should be placed in the position shown so as to get the light over the right shoulder when working.

Although electric light makes the best illumination for night work, gas should also be piped over the bench for use when soldering and when open flame heat is necessary.

If the sides of the basement are plastered, sound out the location of the wall studding, nail a board along the wall at that height and fasten the bench to it. Use screws through the backboard, as before stated. If not plastered, fasten directly to the studding or brick by nailing into the mortar. A vise and drill press clamp well on the projecting edges of the bench.



GALENA—THE TALKING CRYSTAL

An Interesting Assembly for Unique Effects

by ROGERS D. RUSK

A CRYSTAL of galena deserves the name talking crystal because it can reproduce human speech directly when connected in an electrical circuit. The galena (lead sulfid) fairly talks, because nothing more is necessary than to place it in contact with the platinum point of a phonograph diaphragm and it will reproduce any words spoken into the sending circuit. Even without the diaphragm it will emit sound directly if the impressed current is strong enough.

For some time galena has been recognized as one of the most sensitive detectors of wireless waves. It belongs to the group of detectors known as rectifiers, and any kind of a metal point in contact with the crystal will permit electric currents to pass in one direction only. The peculiarity of galena is that weak currents are rectified so that they pass in one direction but strong currents are rectified so that they may only pass in the opposite direction. Points of maximum sensitivity, of course, must be located on the crystal in order to obtain the best results.

The cause of this peculiar action is believed by Mlle. P. Collet, the discoverer of the effect, to be due to the heating of the crystal at the point of contact. This heat produces a mechanical vibration which is the source of the sound waves. The crystal is so sensitive that the delicate vibrations of the voice are reproduced, though at times the pitch of the tone emitted is not the same as that received. Due to the rectifying action of the crystal, the electric current flows more readily across the point of contact in one direction than in the other. Hence, when flowing in one direction more

energy is used up and the point of contact is heated, while when flowing the other way less energy is used up and the point is cooled.

Why some points are more sensitive than others is not fully known, but some light was thrown on this subject by experimenting with nonsensitive pieces of crystal in order to discover how to make them sensitive. The crystals were subjected to various chemicals without effect until sulphur vapor was tried in a current of nitrogen gas. This produced surprising results and the poor crystals became as sensitive as the best.

The diagram shows in a simple form how the voice may be reproduced. The microphone M is connected in series with a source of high frequency current H. F. to which the crystal is sensitive, and the two terminals are connected to the galena. Best results are obtained with a platinum point and when this is used the phonograph diaphragm and horn may be attached to it. The wire leads may be lengthened out to another room,

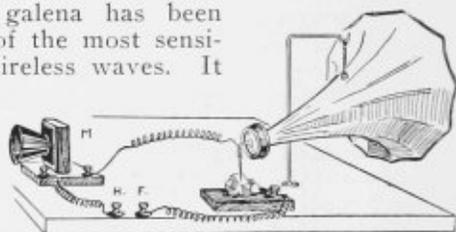


Diagram Showing Connections and Assembly of the Outfit

Discovery of the Telephone

A surprising fact is that the possibility of transmitting sounds over wires was discovered by Dr. Graham Bell because of an accidental misadjustment of his telegraphic apparatus. It occurred in 1875 when a transmitter spring jammed and caused the magnetized steel to generate a current. You can imagine the young inventor's excitement when he detected a faint sound being reproduced in his receiver. Realization of his dream of telephonic speech was then a matter of unremitting labor until he gave the world the telephone in 1876,

RADIO OFFERINGS

AFTER months of experimenting an instrument is presented which meets exacting demands for volume and clarity of sound at all frequencies. The novel principle upon which it operates is responsible for the true reproduction which it affords. In contrast to other loud speakers, the sound waves are given directly from the diaphragm rather than in an indirect way by reflection from the sides of a metallic horn. This completely eliminates tinny sounds.

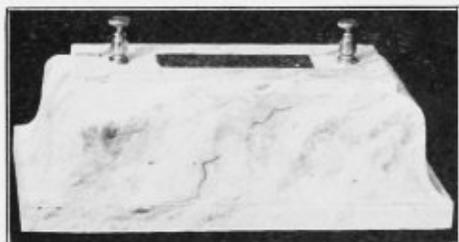
There can be no prolonged sound after the original sound ceases for there are no parts that can possibly vibrate. The only elements that can move are those whose movements are rigidly controlled by the impulses supplied to the loud speaker.

The electromagnetic unit of the instrument is exceptionally efficient, converting into mechanical energy a larger part of the applied electrical energy than other telephones of its class. This is accomplished without the use of an external battery.

In order to obtain maximum efficiency with various inputs of power a knurled thumb-screw adjustment is provided for setting the armature in a position to most advantageously take care of the feeble

impulses fed to the instrument. With this the operator can vary the volume and quality of sound to suit the particular conditions at hand.

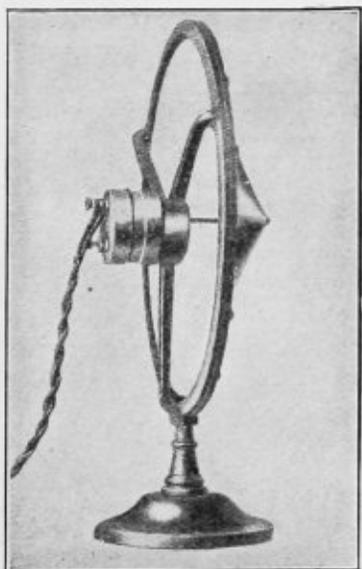
The instrument is light in weight and is extremely compact. It is so ruggedly constructed that it is not easily damaged, the diaphragm being the only part which rough handling might injure. The instrument will continue to give the same clear sounds even though the cone may be punctured in several places.



THIS apparatus may greatly change the present mode of radio receiving. The invention is a little block of composition marble 4 inches wide and 8 inches long, which, according to the inventor, takes the place of the familiar four-strand wire antennae and all outdoor wiring. The function of the marble antennae, says the inventor, is to separate the radio waves gathered from the ether by the wire systems erected for other purposes and conduct them to the radio receiving set.

Inside the marble block is an electric coil. Outside are two terminals. Attached to one of them, an electric cord leads off and is connected with an electric light socket. (It makes no difference whether it is direct or alternating, as no current is used and the switch is not turned on.) From the terminal on the opposite end of the marble a cord similarly leads off to the receiving set. Any other electric wiring system, such as the telephone, etc., can be utilized.

According to the inventor, "The Marble Antennae," as he calls the invention, eliminates not only static but also the danger from lightning by doing away with the aerial towers and wires. Further, he claims that he has operated the device during lightning and rain.



It Is Well to Use a Receiver Fitted With a Two-Stage Amplifier and 110-Volt B Battery

Toy Power Boat Made from Mousetrap and Clock Gears

by L. B. ROBBINS

WHEN the spring thaws come around it is always the delight of the boys to sail boats in the puddles and flooded areas that abound. Many types of power-driven boats are in evidence from the expensive toy steamboat to the lowly kind driven with an elastic band.

The one herein described is a radical departure from the ordinary type as it is driven from the power derived from a common spring mousetrap—popular in the five- and ten-cent stores—and a pair of old clock gears.

Make the hull from a piece of soft pine a foot long and about 4 inches wide. Fasten the mousetrap near the bow and in the middle of the board. Be sure that when the spring lever is released it rests on the base facing the bow.

Next, make a stiff metal bearing plate, as shown, about 3 inches wide and high enough to carry the gears clear of the deck. The two bearing holes must be drilled after the relative position of the gears are determined. Fasten the plate to the deck with screws behind the trap.

Choose one large gear and another about one-quarter the diameter to train with it. Solder a shaft of stiff

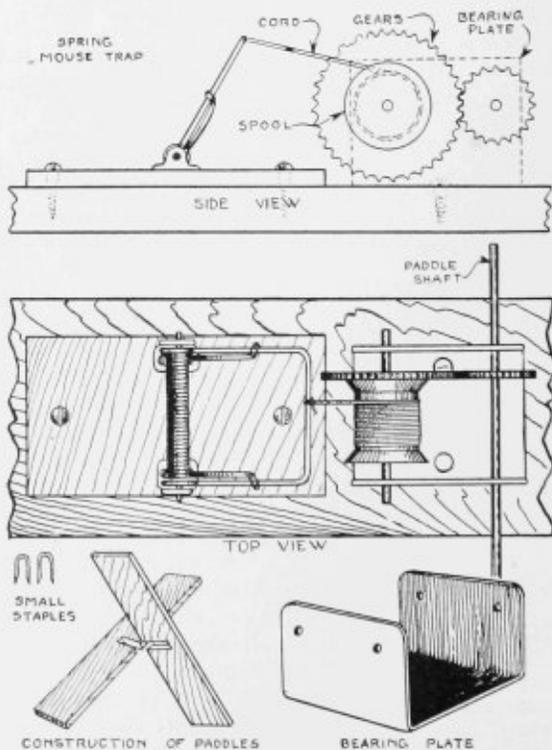
wire through each and mount in the plate in the relation indicated. A small silk spool should be fastened to the center of the large gear with screws.

The shaft of the small gear carries the paddle-wheels, which are indicated in the drawing. With the paddles assembled, bend the ends of the shaft at right angles and fasten them to their centers with a couple of small staples. Be sure they turn without any more wobbling than possible. Connect the spring of the trap to the spool with a stout cord and make a rudder of a piece of shingle by which the boat can be steered.

To operate the boat, pull the spring way over towards the gears and wind up the slack cord by turning the paddles. Set in the water and release the spring. Its effort to go back to normal

will pull the cord which operates the gears and turns the paddles. The width and depth of the paddles will determine their speed in the water and the speed of the boat. With gears of a considerable ratio, the big gear will turn slowly and the paddles quite fast.

Boys can have much fun making one of these boats now, and then sailing it when warm weather arrives.



A Knock-Down Hen House

By ERNEST F. AYRES

WHENEVER your income fails to stretch far enough to cover the monthly bills, someone can always be depended upon to suggest that a few hens will solve the problem. This is all very nice for people whose work keeps them in one locality, but civil engineers, ministers, school teachers, and other "educated tramps" soon find that the cost of housing her feathered highness is greater than the profits. It costs very little to build one house, but it gets monotonous to rebuild when you move frequently.

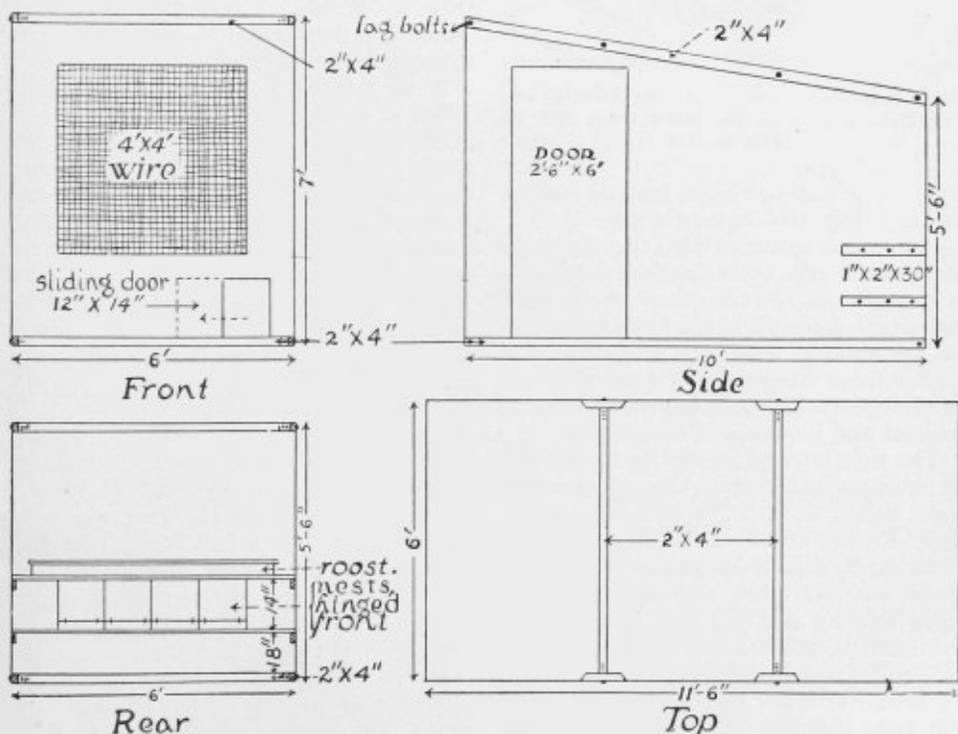
A western civil engineer solved this problem by building a house that can be knocked down and reassembled in half an hour—or less if you are handy with tools. Only a screw driver and a monkey wrench are needed for both operations. The house is built without a floor, and with no studding at the corners. The boards run up and down and are joined at the corners by 2-inch screws. The 2 by 4s used for sills and plates are joined at the corners by 6-inch lag bolts. The

roof is screwed on, as well as being held by lag bolts at the crosspieces. The inside furniture is set high above the ground, so there is plenty of scratching space, and, as it is neither nailed nor screwed in place, it is easily removable.

Bill of Materials

2 x 4s.....	76 lineal feet
1 x 2s.....	10 lineal feet
1 x 4s (for wire).....	16 lineal feet
1-inch boards (house).....	255 feet board measure
1-inch boards (nests).....	36 feet board measure
Wire	16 square feet
Tar paper.....	69 square feet
12 6-inch lag bolts, 24 2-inch screws, 2 door hinges, 8 nest hinges, 1 hasp and lock.	

Biddy likes familiar surroundings, so the house pays for itself in more ways than one. She does not need to be shut up in a barn, or in a neighbor's garage, while her new quarters are being built, or while the piano is being removed from her old home. She can move right into her old nest and get busy laying eggs for breakfast.



Tailor Your Own Chairs

By OLIVE GRANGER

FURNITURE is expensive nowadays, and the first thing the careful housekeeper thinks of doing to save her upholstered furniture is to have slip covers made. But when she essays to buy these slip covers she is astounded. Not



Many Pieces of Furniture Can Be Covered with New Material So That the Entire Home Will Be Brightened

only is the material high, but the cost of the tailoring, too, is exorbitant.

It is well worth while, therefore, to make these slip covers at home. There is enough interest in their mechanical construction to call in the aid of the men of the family for geometric figuring. Under these conditions, the construction of the covers will be a matter of general interest and money will be saved.

The first attempt should be made with an unimportant chair. One of the simplest things is a bedroom settee which may be easily fitted with 31-inch material. Five yards should be ample. Take the lower cut end when the material is the right way up and pin it to the settee at the same distance from the floor as the side edges come. Carry it along the seat, up over the head, and down till it is at the same distance from the floor as the

first end. See that it is all straight and even at each edge, then cut off.

Pin a mitered pleat at each corner of the foot to make the edges fit down; then, where the material leaves the seat to go up over the head, cut the edges of the material 2 or 3 inches till you reach the edge of the seat. Into this insert a square of material. An alternative is to push the material into the space between the head and seat till enough fullness comes at the edges, but this is more difficult for a beginner.

Pin paper over one end of the head and cut a pattern of the panel. Lay this on the material and cut two panels with 1-inch turnings, taking care to reverse the paper for the second so as to get the opposite panel.

Unless you are clever at sewing, do not attempt to pipe the seams the first time. Tack the panels with the 1 inch turned in, then pin in the center on to the settee and arrange the edges over the other material, making neat pleats where there is fullness. Machine this neatly on. Make a rather scanty flounce of the remaining material and machine on with a small heading; then the cover is finished.

To cover a Chesterfield settee and one or two large chairs requires more skill, because the settee needs a double-width material and the chairs work out most easily in single width. If you must use single width on the settee, you must match the pattern very carefully, but the stitching down the center of the seat is always likely to break from wear.

Supposing 50-inch material is to be used. Pin the bottom cut edge to the lowest front edge of the settee, carry over the seat and push into the upholstery about the length of the hands. See that it is absolutely even and true along the whole width; then carry over the back and down to the bottom edge of the back. The material for the two arms should come out of exactly half the width. Pin the lower cut edge to the selvage of the material on the seat and push in the same distance as the back piece. In a large settee the seat is 50 inches, so all the

"push in" must come from the arm material.

Arrange the material evenly with 1-inch turnings round the front panel of the arms, pinning in under the rolled edge, as the panel will draw it in here. Carry down the same length as the back. Cut arm panels the same as for the ottoman.

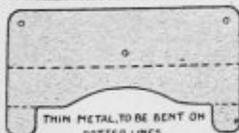
A lounge settee will require the same sort of panels for the ends of the back, but for a Chesterfield pin one corner of the material (with ample turnings) in where the back and arm pieces part; then carry over the pleat under the rolled corner of the back. Cut a straight piece to join on to the back and arm pieces from the floor upwards, turn its cut edge over the pleats and cut off the remainder of the corner piece. Finish with a frill around the foot.

Cutting chair covers is very much the same. Unless it is a small, all-over design, be very careful not to get it all to one side of the chair. Keep the foot frills rather scanty. They will mostly come out along the side of the material for chairs, and enable you to keep the seats and backs to the center of the design.

If the material is washable taffeta, do not fit too closely, as it tends to shrink slightly; cotton cretonne, on the other hand, generally sags a little after washing. In piping seams shrink the cord first and cut its binding all on the cross.

Pencil Holder

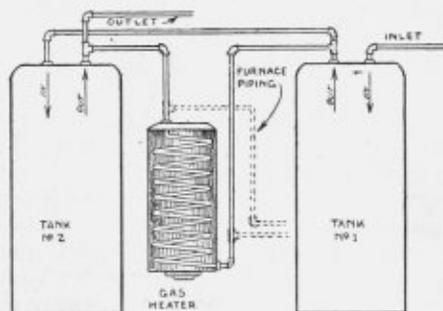
A simple pencil holder that will prove to be very handy can be made of one



piece of thin metal bent to the shape illustrated. It is easy to cut out and only requires three small holes so that it can be fastened where desired. The three bends are simple and easy to make. A little contrivance of this sort to hold pencils will be found especially convenient if located near the desk.

Improve a Water Heating System by This Method

It is a well-known fact that when hot water is drawn from the tank of most hot-water systems, it is replaced with cold water coming into the tank. For this reason, if a large quantity of hot



Save a Good Deal of the Cost of Heating Water by Installing This Better Method, a Double Tank System

water is drawn off for washing or bathing, the tank soon becomes cold.

A way to overcome this disadvantage is shown in the sketch.

The principle of the system shown in the diagram is very simple. When hot water is drawn, it comes from tank No. 2 and is replaced with hot water coming from tank No. 1, both tanks being heated by the one gas burner. This arrangement will allow hot water to be drawn even though large quantities have been drawn off previously.

Two tanks of standard size may be used instead of the small ones shown or one large tank for No. 2 and a small one for No. 1.

The dotted lines show how to connect pipes for heating with a furnace, which is done quite frequently. The two parallel pipes should project into and to one side of the fire pit.

Loose Nails in Plaster

Frequently a nail in plaster becomes loose and there appears no alternative but to make another hole. As holes are unsightly the nail may be wrapped with paper, smeared with glue or gum, or a wad of gummy paper made and the hole filled. The nail can then be fastened in the same place so that the walls may be kept in original perfect condition.

William Hodge—His Message

(Continued from page 185)

Just how you will read the message in Hodge's play depends upon you, yourself—upon what is in the back of your head and the bottom of your heart. But one thing is certain, it will prove this fact to you: much of the misery, ugliness, unhappiness, illness, trouble, hard luck or failure you have experienced was cooked up for you right in your own head.

Hodge's play is not based on autosuggestion. It goes farther than that. It deals with morals and with God. It teaches us that our thoughts mold our bodies—but it also teaches that something molds our thoughts. And that something is what you read it to be. That is why Hodge's play with his message is for all of us—because it leaves the picturing of that something to the individual.

Coué's autosuggestion is physical culture for the mind—Hodge's play is a sort of physical culture for the soul. And yet it's practical—everyday, hard rock, practical.

"How does Hodge's theory work?" You've heard the expression, "Nothing Succeeds Like Success." That's the answer. Success strengthens the positive brain and weakens the negative brain. Success brings thoughts of Success. Also thoughts of Success bring Success. As you think, so you are.

This actor's message teaches us that our thoughts mold our bodies. It teaches that when we thoroughly realize this we will watch those thoughts. It teaches that they mold more than our bodies—that they mold our character and our future; that they determine the degree of health we enjoy and our chance for success and happiness.

The play "For All Of Us" is causing considerable religious and scientific comment—in fact four different sects claim it as the exposition of their particular brand of religion, while the agnostic, the pagan and the atheist explain that it gets away from the old hide-bound traditions and tells the truth. All of which proves that it is based on a universal truth.

In "For All Of Us" the situation is simply this: A worldly man of great wealth is stricken and the finest physi-

cians are unable to do anything for him, but not through their own fault. They are unable to help him because his mind will not permit them to help him. He is feeding his evil mind and nourishing it in such a way as to defeat their efforts.

Mr. Hodge plays the part of the old laborer who pounds out in the street night after night, and who is finally called into the sick room. This old laborer has been through the mill himself and has developed the true philosophy of life—Hodge's idea of the real Christian religion. This old fellow analyzes the rich man's trouble in a series of talks with him, and proceeds to pump truth into him. He tells the stricken rich man, in a characteristic manner, colored here and there with originality and humor, that as long as he sits there and mentally fights those who are trying to help him they are helpless. He points out that the power for good or evil, for health or sickness, for right or wrong, lies within ourselves. And then he illustrates that mistakes are the result of wrong thoughts, and that so-called hard luck is usually the fault of mistakes. He says:

"There are just as many kinds of mistakes as there are kinds of bad luck. In fact, a certain kind of mistake will always make its own kind of bad luck."

"But," objects the rich man, "don't you think it is human to make mistakes?"

"I sure do," replies the old Irishman, "Lord knows I've manufactured enough of them in my day. But I don't think it's wise to stand around and let your mistakes murder you."

To use the words of the philosophical laborer of the show: "Sure there's no health exercise in the world like kicking the devil in the face."

Briefly, this is Hodge's message: Do the right thing—repeat it until it becomes a habit. That will strengthen your positive or good mind. Fight wrong thoughts, strangle your negative mind. When you develop your positive mind you develop the thoughts of success and happiness and health, and those thoughts bring their material counterparts. When you strangle thoughts of greed and hate and envy and revenge you are "kicking the devil in the face."

HAVE YOU HEARD THIS ONE?



A PHILANTHROPIC lady visited an asylum not long ago and displayed a great interest in the inmates. One old man particularly gained her compassion. "And how long have you been here my man?" she inquired.

"Twelve years," was the answer.

"Do they treat you well?"

"Yes."

After addressing a few more questions to him the visitor passed on. She noticed a smile broadening on the face of her attendant, and, on asking the cause, heard with consternation that the old man was none other than the medical superintendent. She hurried back to make apologies. How successful she was may be gathered from these words: "I am sorry, doctor. I will never be governed by appearances again."

WHEN the Germans say they didn't lose the war, they mean it isn't going to cost them anything.—*Washington Post*.

"YOUR father is a crack golfer," said a friend to the son of the golfer.

"So he is," agreed the youth as they heard a sharp snap, "that's the fourth club he has cracked this morning."

FROM the way these executions of Irish republicans persist we would gather that they still insist that the national emblem should be a harp.—*Manila Bulletin*.

SATISFIED GUEST—"That was a tiptop dinner, waiter. You know what that means, don't you?"

Waiter—"Yes, sah. It's one that you top off with a tip."

THE many rumors to the effect that Charlie Chaplin was to embark in the serious drama seems to be verified in the statement that he is about to be married.—*Kansas City Journal*.

WHAT'S de name of dis infant?" demanded the colored parson who was officiating at the christening of Mandy's latest offspring.

"Her name am Opium Bryant," was the firm reply.

The parson protested: "Opium ain't no fit name for a gal!"

"Well, it fits dis gal," said Mandy, "for dey say opium comes from wild poppy, and dis chile's poppy suah am wild."

GERMANY has given up the goose step for the side step.—*Washington Post*.

"WHICH way to Ottawa, my lad?"

"I-I don't know."

"Which is the way to Topeka, then?"

"I-I don't know."

"Well, can you tell me how to get back to Wichita, then?"

"I-I-I don't know."

By this time the drummer had become quite impatient and said to the boy: "Say, you don't know very much, do you?" To which the lad retorted:

"No! But—but I ain't lost!"

If he had done nothing else, M. Coué would deserve consideration for having crowded the monkey gland experts off the stage.—*Portland Oregonian*.

"ONE of them city fellers tried to sell me the Woolworth building."

"What did you say?"

"I sez, 'All right, young feller, wrap it up.'"

THE price of eggs has gone up again. The hen lays for the dealer, and the dealer lays for the public.—*New York American*.

Two hunters in the North Carolina woods had chased a wildcat to a clearing and were terrified to see the beast jump into the window of a cabin from which the sound of a woman's voice had just been heard. On the porch, rocking comfortably and apparently unperturbed, sat Friend Husband.

"For heaven's sake, is your wife in there?" screamed one of the hunters.

"Yeah."

"Good Lord, man, get busy! A wildcat just jumped in the window!"

"Yeah? Well, let him get out the best way he can. I got no use for the pesky critters and danged if I'm goin' to help him."

"EUROPE is on the Brink." Or would you, possibly, call it on the blink?—*Boston Transcript*.

Setting Civilization Forward a Hundred Years

(Continued from page 243)

concentrate sunlight upon a small boiler, thereby generating steam. But the mirror surface required is enormous in proportion to the power developed. Even were some more economical method devised, there still would be the problem of getting power at night and on cloudy days. Thus the storage problem is intertwined with both of these auxiliary methods.

Tide-motors must be included in any survey of possible power sources. It is the fashion, of course, to cry down tide-motors; but this is done by way of arousing and maintaining a healthy skepticism among credulous people who otherwise might fall for various "get-rich-quick" schemes based upon tide-motors, rather than because tide-motors are logically impossible. They are not in the class of perpetual-motion machines by any means. The power is there. Imagine the machinery that would be needed to heave the entire ocean up twice a day, if you don't believe it! The problem is to get at the power—to harness it. Here are a few samples of the difficulties to be surmounted:

A dynamo must spin at high speed in order to work efficiently. The tide takes six hours to rise, and six more to fall, through a distance of several feet. This speed must be "geared up" somehow, if it is to be hitched to a dynamo, or else a "slow-acting" dynamo must be invented.

Impounding schemes, such as imprisoning high-tide water and feeding it out through turbines, would cost more for dams and machinery than the current obtained would be worth.

Even if invented, tide-motors of course would be subject to the difficulties which are hampering full hydroelectric development—the difficulties of transportation and storage, particularly the latter. Transportation troubles would not be so bad on the Atlantic coast, where markets are near at hand; but storage would be

necessary, unless the motor worked both on the rise and ebb of the tide, and to conserve power generated at night against the needs of the following day.

We have seen now the principal obstacles blocking the Electric Age, as viewed from the engineering viewpoint. Back of it, of course, is the financial difficulty, that of paying for all the installations needed. This difficulty, however, would be temporary, once the necessary inventions were made.

Just as steam and machinery enabled the world to pile up the tremendous surplus upon which our present civilization rests, so would the first installations under the Electric Age pave the way for more—and the building up wouldn't take a century, either, as steam-power civilization did. Steam and machinery all but wrecked society a century ago, in the so-called "Industrial Revolution," by providing a surplus so suddenly that millions of hand-workers all but starved to death through being thrown out of work *en masse*. The world had to increase its population and develop higher living standards before everybody could be employed to profit under the new regimen. But the change has been made now. The "market," so to speak, has been created, and is ready to absorb improvements as fast as they are offered. The Electric Age can make its way the moment it gets started.

How are these inventions to be made? What is the line of attack upon the problems involved? The writer doesn't know. If he did, he'd make the inventions, and live at ease instead of writing for a living. But that is beside the point. The point is, there's no reason in the nature of things why they can't be made; there's ample reason why they should be made; and there's reward beyond the dreams of avarice for the man producing them—you, for instance, if you have the inclination and the ability!

Motorists will find the May issue brimful of practical articles, which include "Swinging in Comfort from Florida to Indiana," "Stopping Rattles and Squeaks in the Car," "Removing Carbon from the Motor," and "Monogramming the Car."

Do You Want to Write?

(Continued from page 237)

manuscript. No matter how wonderful your writing may be it must carry a real thought, and you cannot afford to handicap yourself by not understanding the principles of rhetoric or by using a stilted uninteresting style.

Do you still want to carry on? You do? All right. Let's see how we can smooth down the road and if we can find any short cuts, and let's see what the prospects are ahead. If you have weathered the storm we will see what's at the foot of the rainbow.

There is no profession that stands higher than literature. There is no honor that the writer has not enjoyed—nothing to which he may not reasonably aspire. He is essentially the leader of men, for he is the mold of thought. He is the thinker, the creator, the inspirer, the entertainer, the instructor and, when needs be, the scourger. He leads through inspiration or drives with the sting of the lash of criticism. He is the voice from man to man, from nation to nation, from race to race. He is the great commoner—the peer of kings. He is the voice of humanity, the mouthpiece of progress, the recorder of history.

And the rewards of his profession? Fame, world-wide fame—the fame of a Shakespeare, a Kipling, and O. Henry, a Hugo, a Byron, a Franklin, a Darwin, an Aristotle; power—the power of a Roosevelt, a Northcliffe, a D'Annunzio, a Wilson, a Disraeli; wealth—the most successful writers of today will earn a fortune in a single year. The day when the writer is thankful for a dry crust is long past. Today he wants his advance, his serial payments and his royalties—and then he will dicker with the theatrical and the moving-picture producer. In this way a single story will sometimes earn hundreds of thousands of dollars. "The Four Horsemen of the Apocalypse" is said to have earned more than a million dollars. The best editorial writers, especially those dealing with political and inspirational subjects, earn as high as a hundred thousand dollars a year. Oh, you need not worry about the financial returns if you have something to write about and know how to write interestingly.

Real writers are always sure of real rewards.

And now the environment, the conditions under which they work. No other profession or trade or calling can compare to the freedom, the pleasing environment and the possibilities for travel and enjoyment that are open to the writer. He is his own boss—the one free man, so to speak. He comes and goes as he will. All business, all science, all sports, all society is open to him. He is the peer of every class. Fame, fortune, power and friendship await his will. He is equally welcome in the palace or hovel. He is sought alike by beggar and merchant prince. Oh, it's worth-while, that writing profession, if you've the backbone to stick it out!

And now how to train yourself to write and to sell. First, set aside a certain period each day in which to study language, grammar, rhetoric and composition. Spelling, too, if you are weak in that.

Now put aside another half hour each day for the review of the class of writing you wish to do. For you must decide what you want to write before you try to write it. Perhaps you will want to write poetry, or fiction, or editorial matter. Perhaps you are interested in descriptive writing. Decide definitely what you are interested in. If it is politics, you need not spend your time studying the work of the scientific writers. Instead, you want to concentrate on politics. You must know politics, and you must see how the best political writers deal with that subject. Then you will analyze their stories and see where you think they are strong and where you think they are weak. You will copy them, substituting your own ideas here and there throughout.

But all the while you will remember that to be a finished writer you must have a broad knowledge, a knowledge that can come to you only by spending a little time each day reading good poetry, good inspirational writing and history. You will understand that though you are to concentrate your study and your writing to one subject you must broaden yourself by reading in all lines.

You will spend months studying the

particular subjects you wish to write on, and in learning the most acceptable style among the writers of that subject. You will learn what features and phases of the "stories" are "backbone" and which are merely fillers. You will learn to put your finger on the essential points.

Soon you will have a big idea yourself, an idea you think is worth passing on to others. This is your "story." But wait—don't rush. Revolve the subject in your mind. Mull it over. Digest it. Measure it by the stories of other writers—see if your philosophy and your facts are right.

When satisfied on these points, you will select the medium you think should run your "story." You will study that. You will get its editorial viewpoint. You will not in any way weaken your own story and your own idea but you will cut it to the cloth of their editorial contents. You will write that story carefully. You will put it away for a few days and revise it. You will do that again.

Then send it in. You will probably get it back again with a nice rejection slip. If that discourages you—quit. If it does not, remember that you are now competing in open market with trained writers.

See if you can find anything wrong with your story. If you cannot, put it away and get ready to do another one. If that goes the same route, put that away and do still another. Keep it up. Stay with it! Read the stories of other writers. The greatest of them struggle for years before they get recognition. Especially is this true of fiction writers.

As soon as you win recognition and sell a story or two, go and see your editor. Get his viewpoint. Find out what he wants. Submit ideas to him. Then go back and write. Write to please him and soon you will be writing to order.

But all the time you will remember that you are the captain of your literary bark—that you are going to do your own thinking. Perhaps there will come a time when you disagree with your editor in regard to what should or should not go into an article. Be sure you are right—then go ahead. If the finished product proves you are right the editor will respect you the more and be glad to get the story, too.

Once you get so you can write what he wants and he gives you assignments, don't follow the way of so many writers. Don't "play safe" and wait for his assignments. Don't let him do your thinking for you. Don't slouch around and make him furnish the initiative for you as well as for himself. Think out your own ideas.

Above all, don't be afraid to be original. As soon as your work is acceptable for publication let loose—don't follow the beaten path. Express your own thoughts in your own way. This will likely cause rejections, but it will teach you to write for yourself and to write original stories. That is the only way to success and fame.

Don't become a routine man. Don't write the same stuff over and over again, simply because you can find sale for it. You never stand still. You must either develop or atrophy. If you settle in a rut in writing and stop thinking for yourself you will simply become tiresome to yourself and to everybody else. Keep thinking and keep moving, for the writer must keep abreast of the times—ahead of them, if he expects to make a mark.

And the while you will remember to keep broadening yourself by reading and study and research and by listening. Keep your mind keen and your senses alert. Learning and writing—those are the twin stairs to success in the writing game.

In the May Issue

Do you know Rudolph Valentino, the man? Probably your impression of this most popular of all movie stars has been formed from the stories and discussions you have read and heard about "The Sheik." In the May issue of ILLUSTRATED WORLD William Fleming French gives you a real picture of "the man." Mr. French's article is based on personal contact. Here is an opportunity to really know Valentino.

Only a Postage Stamp

(Continued from page 249)

to the city or country post offices throughout the nation.

But after the stamps have been counted into bundles, sealed and prepared for shipment to the local post offices, the men who are responsible for them must trust to other agencies than their own supervision. The eyes of the government still follow the stamp, but it is through methods of safety adapted to the protection of great values rather than of small individual items.

Daily orders frequently embrace one hundred fifty million or more stamps each. The shipments of stamps to New York, Philadelphia, Chicago, and other large cities are of great value. The bulk of these shipments consists of packages containing two hundred thousand stamps, and at no stage of the journey are they exposed to danger of loss or theft.

The trucks in which the stamp bundles are handled are large wooden cases mounted on wheels and standing five feet high. These trucks are rolled into the cage at the Bureau of Engraving and Printing, where an order from a postmaster in a distant city has been prepared for shipment. The countless checks and recounts have made the sealed packages accurate beyond question.

The packages are thrown into the tops of the box-like trucks, each being checked off on a list as it goes in. When the truck is full, the man who has supervised the loading closes the top and puts a lock on it, the key to which is held in the registry division of the post office, or in his own pocket. The truck is wheeled out of the cage, across a little platform and into a big caged wagon. Guards stand by as it is placed in position. Four of these boxes can be put in the wagon at a time.

Two men step inside when the loading is finished, and the doors are locked upon them and the load of stamps. The other guards mount the rear of the wagon and the representative of the Bureau, who is to deliver the load of stamps personally to the superintendent of the registry division, takes a seat in front with the driver. When the wagon arrives at its destination other precautions have been taken to protect the stamps from loss and theft.

Under the eye of the representative the stamps are transferred to the custody of the superintendent of registry and prepared for the mail.

One at a time the trucks are taken from the wagon, the guards remaining at the wagon. The locked truck passes into an empty room and the door is locked behind it; then another door is unlocked and it passes into the registry room. This room with the two locked doors, both of which are never unlocked at the same time, is the scheme which has been devised to prevent any "get-away" from the registry office. In a large receiving cage the stamps are lifted out under the eye of the man from the Bureau, who checks the packages as they come out. When the count is completed the load is shifted to the registry division of the post office. This division now becomes responsible for the safe carriage of the stamps to their destination.

The same men who unload the stamps from the trucks put them into the sealed pouches for the registered mail. By this plan it is known exactly what men were in the registry cage at the time a certain stamp shipment was handled. If a shortage of packages should be reported a month later in any stamp shipment handled through the office, every man who might have handled it could be immediately located. This is accomplished by a system of checking every man into and out of every cage he entered in the registry office.

The shipments of stamps are handled through the registry office with great speed. It is the aim of the service to make the handling of this valuable registered mail as rapid as that of any first-class mail, notwithstanding the constant safeguards that must be maintained. A shipment of fifty million stamps can be handled from the Bureau of Engraving and Printing to the post office in four wagon loads, and it is a matter of record that a wagon load can be received, checked out, sacked and loaded into the wagon for the train within the space of a half hour.

After being put in the registered sacks the stamps are still subjected to close guard.

Is There Safety in Danger?

(Continued from page 233)

Illustration of the dangers is an experience of Miss O'Laughlin that shows the chances she takes. She was told that the depth at a certain part where she was to dive was eighteen feet. In her dive she discovered that it was four feet. She went a foot into the soft ooze and arose almost choked with mud. This did not deter her from repeating the stunt without injury. Later, while just fooling on a "baby's springboard," she met with a serious accident.

For Miss Madeleine Berlo, one of the most daring of the girls in the diving game, the same thing is true. Without a mark from any of her many breath-taking stunts, she yet carries a red scar across her temples. "The price of a life of danger" anybody would say seeing it. But the truth is she never met with an accident in her work and the scar is the result of the explosion of a can of over-ripe baked beans.

Her sister Miss Lillian Berlo, who does many of her tricks with her, recently barely escaped drowning. But not, mind you, during one of her feats. She was in swimming for her own pleasure without a thought of giving herself or anybody else a thrill. She was thinking perhaps what a change it was to be swimming in this fashion calmly and peacefully instead of risking her life diving off great heights. Suddenly one of her feet caught; in trying to extricate herself her other foot became entangled; she tried to get her feet free and her hands were entangled. It seemed that she was to meet her fate. Fortunately her calls for help met with timely assistance and she escaped. It was an old net floating under water in which she became entangled and that nearly drowned her.

Miss Dorothy Gates, another famous high diver, is having a hard time living down her mishap. She slipped while in her bathtub and sustained injuries so severe that she was laid up for several weeks. In all her dare-devil exploits in the water she has never met with any injury whatever.

Miss Eva Miller, who has performed one of the riskiest stunts on record, has this tale to tell. During midwinter in Minneapolis, she dived through a hole cut

in the ice. The dive was from a bridge seventy-two feet above the surface. In this dive she not only risked the chance of miscalculating and killing herself on the ice sheet, but also temporary paralysis from the shock of the intensely cold water and death from drowning because of the dangerous currents that sweep the river under the ice sheet. However, she performed her exploit without a scratch. But on the way back, an automobile in which she was riding was struck by a runaway milk wagon and she was badly cut by the broken glass.

Still more extraordinary is the experience of Ruth Loos. She varies high diving and similar thrilling stunts with dare-devil horseback riding. One of the things that she can certainly do is keep her balance. But the New York subway was too much for her. When an express train in which she was riding suddenly stopped she was thrown violently against a door and received the most serious injury she has ever suffered.

The Wealth of the Sea

The United States has what is said to be the most valuable fishery in the world, but probably not one person in ten can name it. It is conducted in every sea-coast state from Cape Cod to the Rio Grande, and from Puget Sound to San Francisco and it yields annually about 115,000 tons of food as prepared for consumption, an equivalent of 400,000 dressed steers. It employs about 67,000 persons, and its annual product, as it comes from the water, is valued at over \$15,000,000. There are other fisheries that possibly exceed it in the ultimate value of their products, but in such cases much labor and material and a heavy investment of capital have been concerned in manufacturing operations to prepare the product for the consumer; as, for example, the canned-salmon industry of the Pacific Coast.

The American fishery for codfish on the Atlantic coast, which has been the cause of much diplomatic discussion and of grave international negotiations, appears almost insignificant in comparison, its value in normal times before the great war being about \$3,000,000 yearly.

Reshaping Unshapely Paint Brushes

After considerable use and more or less neglect a paint brush will become ragged and out of shape. This makes it difficult to use where good work is necessary, as the crooked hairs will make undesirable marks and it will be difficult to make a good clean edge.

A good way to reshape a battered brush is to mix up a small batch of flour and water similar to wall-paper paste and fairly thin. Soak the bristles thoroughly and shape them out as smooth as possible with the hand. Lay the brush down carefully and allow it to dry over night. Dip it again in the paste until the outside is thoroughly covered, being careful to flatten down any stray bristles. Repeat this operation until all the bristles are flat and the entire brush is covered with a good coating of paste.

The brush should be allowed to dry out for several days—in fact until it is to be used again. It should then be soaked in warm water until all the paste is removed and rinsed thoroughly.

To Describe an Oval, a Heart and a Shield

The easiest way to get an oval of any dimension is with the aid of two pins and a piece of string. First, as in Fig. 1, draw the line AB , mark off the length of the oval, bisect it and mark off the breadth. Through the two center lines stick the two pins and, with a slipknot, make a loop in a piece of string. It is now a case of trying out until you get the distance apart of the pins and the length of the loop so that your pencil in the loop passes through the marks. The closer the pins the wider the oval. When you have it adjusted correctly, fasten the slipknot and mark off with the pencil.

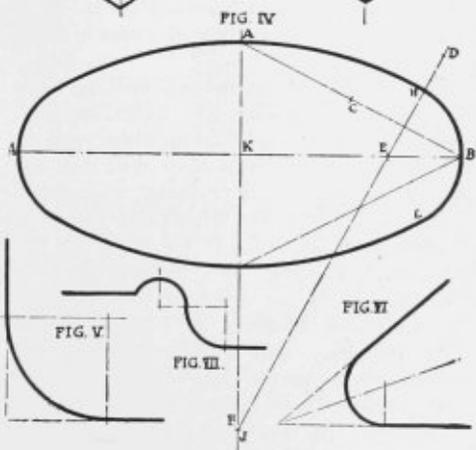
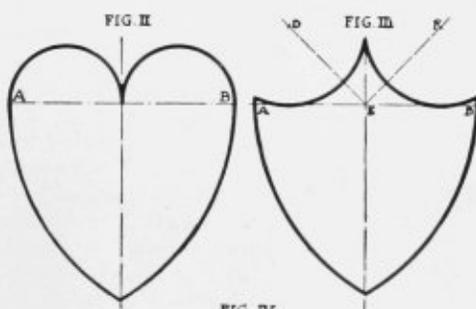
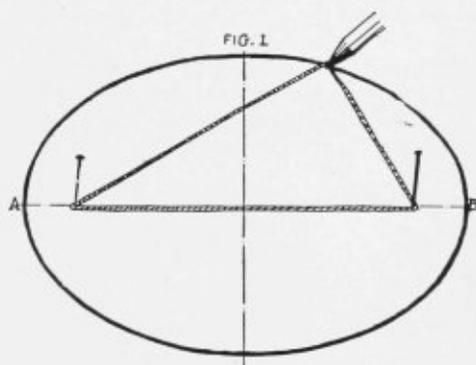
To make the heart, Fig. 2, bisect the line AB then bisect each half, describe the two arcs from these centers, then the big curves with A and B as centers.

For the shield, Fig. 3, describe the two big arcs as before from A and B as centers, bisect the two angles AC and BC , draw the lines DE and FE , and with the leg of your compass on these lines with any radius complete the figure.

Fig. 4 is an oval drawn geometrically,

in a special case. Mark off the length and width, half the length. Join A and B , bisect this line in C , bisect CB in D . Mark E one-third of KB from B . Draw a line from D cutting through E and joining A J at F . With radius FA describe the arc GH and with radius EB describe the arc HBL . Do the same for the other half.

Figs. 5 and 6 show the methods of getting around corners and are so obvious that no further explanation is required, while Fig. 7 is the application of Fig. 5 to a molding.



Analyzing Your Child's Future

(Continued from page 195)

run toward logical argument, to say that he will do best as a lawyer. But many a man with superb knowledge of the law has all but starved to death, because he overlooked the fact that success in law depends not only upon ability to win cases, but to *get cases intrusted to him* by clients. That is the great weakness of the "intellectual"—overdevelopment on the "sheer intellect" side, and inability to make good on the human side, the side where Tommy and Harry would shine. And so with the other types. Each type has its weaknesses as well as its good points—and we must plan how to overcome the weaknesses as well as how to determine the good points, before our character analysis has much practical value.

Once we recognize this, however, we have the clue to sensible education and training. In the case of Arthur, for instance, we see that it is useless to try the good old methods for dealing with such cases such as "driving him out" and "making him mix," to humanize him. The better method lies in using what the soldiers call a flank attack. The characteristic of his brain, as we have seen, is its preference for using the intellectual centers—its tendency to "see things as problems," we might say. All right; in order to "humanize" Arthur, all we need do is to get him to see the business of being humanized as an intellectual problem. It is useless to attempt making a motor type of him; but give him the character elements he needs, disguised as intellectual problems, and he will absorb them readily enough.

Exactly the same tactics will achieve victory in dealing with Ellen, the "motor." Many "motors" and "dominants" fail in life, because they cannot, or will not, acquire the intellectual training and grasp of abstract principles which are essential to great success. But if we work up the necessary training as "things to do," Ellen and her kind will take them. Both the modern tendencies in education and what we may call "self-education for business men" prove this.

Americans are largely "motor" and "dominant" in type, as their characteristic preference for business shows. The

"train-yourself" methods, therefore, so far as they are successful with Americans, consist of intellectual material, disguised and sugar-coated to appeal to the motor mind. And our schools are tending to forsake the "intellectual" training, which succeeds so well in Europe, and coming to give training suited to the motor mind. The intellectual child suffers, of course; but he usually goes on to college, anyway, where he finds a congenial atmosphere, while the great mass of "motors," which stops with high school at most, profits by the change.

Even Marion, the sentimental, yields to this flank attack. She is interested only in things of beauty, emotional appeal, and is deficient in prudence, judgment, and "hard-headed common sense." If given the character-elements she needs as methods of achieving beauty and symmetry in life, she will absorb them far better than under the traditional method of trying to "cure her nonsense"—that is, trying to change her type. The latter method, we know from experience, succeeds only in breaking her spirit or driving her into open and disastrous rebellion.

A glance at the way in which school methods are changing will show to what extent education is profiting by these hints from the psychologist. Instead of the serried ranks of desks occupied by children studying, the individual, formal recitations by one child, then another, we have "socialized recitations" more and more frequently. Such recitations consist of allowing the children to discuss the matter in hand as a group, contributing the information they have gathered about the subject, speculating as to "whys and wherefores," and gradually working out the answer themselves. The teacher's part is to *guide* the discussion, and help the children find the answer; she does not tell it to them. Thus the different types of mind have a chance to approach the problem in hand in their own way—and the teacher can approach each type in the most effective way.

Thus we are coming out from the old doubt, uncertainty, and guesswork methods of the past, and getting a real grip upon the problem of child-training.

Preventing Radiator Hose from Collapsing

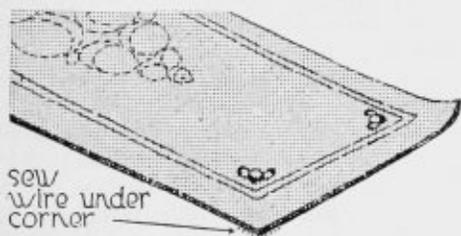
When it seems impossible to locate the trouble with an overheated engine look to the hose and see that it is in good condition, as in time the hose connections collapse. This is especially true with the thermosyphon system, because fairly large hose must be used and this eventually becomes soggy and the walls break down. Though it may appear to be in good condition externally, the inside layers of fabric practically shut off the water reaching the radiator. A hose in this condition will cause the engine to heat through lack of proper circulation. In order to avoid this condition, when replacing the hose, insert a light, coiled spring to hold the hose in its true shape.

Keeping Rug Corners from Curling

One of the most annoying and unsightly things about the home is the curling corners of rugs that have been in use for some time.

While doing some wiring in our home, the electrician left some small pieces of cotton-covered wire. These pieces were of varying length, so I selected those about a foot long.

Noticing the sharp ends of the protruding wire, I pushed back the cotton cover on the wire about one quarter of an inch on each end, clipped off the wire, and then drew over the cotton cover, which I tied with a small piece of thread, thereby

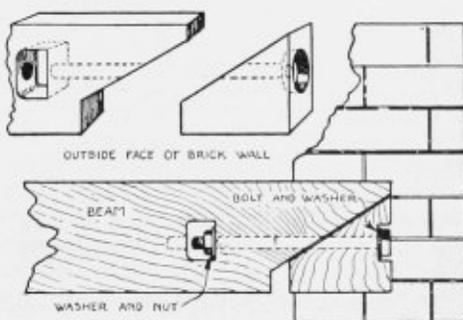


entirely covering the wire. This gave me full assurance that my hardwood floor would not be scratched. I then bent the wire at a right angle and sewed it under the corner of my worst rug. Imagine my astonishment when I found that the wire held the corner perfectly flat.

My husband no longer uses strong language at the rugs nor do the children kick them all over the place.

Attaching Porch Rafters into Face of Brick Wall

In the attached illustration is a detail view of a novel, simple but exceedingly solid means of attaching the end beams of a porch to the face of a brick wall. This construction, which is applicable to either new or remodeling work, makes it possible to place the beam in a small opening where bricks are removed from the face of the wall or where these are purposely



omitted when the wall is laid. The fastening is an idea of a local builder and has been used in the erection of several two-story porches built at the rear of homes and used as sleeping porches. It has prevented the porches from moving outward or settling slightly—a frequent fault with built-on porches.

The idea as shown consists of beveling the end of the beam and fitting a filler piece of the same shape. A bolt through this end of the beam and filler piece terminates in a set-in nut in the end of the beam. Tightening of the nut has the effect of spreading the beam-end which sets solidly into the brick. It is possible with this to make the junction as tight as will ever be required. It is not necessary to use this tie on each beam, as three or four ties will be enough, depending somewhat upon the size and width.

New Carbon Paper from Old

For the writer and business man carbon paper is quite an item of expenditure. It may be made to last about half as long again by holding the worn sheets near a fire of any kind. When the wax melts and runs, there will be an even coat, though it will be somewhat thinner than before.

Does the World Face a Cotton Famine?

(Continued from page 219)

vil can literally eat up half a crop. A rainy summer—so favorable to weevil increase and damage—can reduce a possible crop of twelve million bales to one of nine million bales or even less.

Adding to the danger of the situation is the mildness of the winter just passing. Freezes would have killed off innumerable hibernating weevils. But there have been no general freezes of any consequence. So it is almost certain that weevils will emerge in vast swarms from winter quarters to feast on the young crop and eat into the household money of every family in this country. Only a very late severe freeze can prevent this danger.

Never have quite such conditions faced the entire South on the morning of planting a new crop. Never has the consumer faced such possibility of a cotton famine. Both natural and artificial handicaps are

unprecedented. If it were not for the latter, the former could be overcome. The sun will shine in undiminished brilliancy and warmth over the fields and the green plant will unfold its spotless banners. Chemical food for this plant should be available in great quantities and at reasonable prices. And so should the arsenical dust to poison the natural enemy. Those who supply these products have blundered by not turning to modern methods of manufacture and distribution, or else human selfishness and greed for excess profits have gone to the extent of being utterly regardless of the vital needs of the world for cotton. All that you and other consumers can do is "to pay the price." All the cotton grower can do is to work like blazes and pray for Divine grace to grant him a reasonably dry season so that he can have an even chance in his battle with the boll weevil.

Cho Tso's Spectacles and Yours

(Continued from page 255)

wearing unsightly and conspicuous spectacles. There is a real reason for wearing framed lenses when taking part in some rough sport, and the wearer then must put up with the conspicuousness of the frame around the glass in order to guard against the possible splintering of the glass through which he might lose an eye.

In America the modern glasses are made as nearly invisible as possible, and the old heavy engraved gold and silver frames have gone the way of the dodo.

Modern glasses have much larger lenses than those of ancient times. Until recent years the great importance of having the center of the lens directly before the center of the eye was not appreciated. Our grandfathers wore lenses about the size of a quarter and, as a consequence, looked over, under and around them fully as often as through them. Today our favorite stage representation of the old "rube" has such glasses down on the end of his nose, while he looks over them to keep from wearing them out.

It must be remembered that there is style in glasses just as there is in hats or collars. A style of frame which may be perfectly proper for its purpose may be as far out of place with another costume

and for another occasion as a red shirt with a dinner jacket. A heavy shell spec at the opera is as improper as a rimless eyeglass would be on a duck-hunting expedition.

Glass styles properly chosen will conform to the type of face of the wearer. There are certain underlying principles which should be remembered if the glasses are to grace the face instead of disfiguring the wearer. A person with sallow skin, a light blond or a white-haired person should choose rimless lenses or a rim of light shade if their lack of color is not to be accentuated. A person with a short, broad face should avoid glasses with horizontal lines, while a glass frame of this sort would be best for a person having a long, thin face. If the upper edge of the lens is made with its curve to follow the line of the eyebrow it will result in a glass which will blend into the features, and which will be much less noticeable.

If you feel that you simply must wear a heavy shell spec, go ahead. They may bring you luck, too. They made Harold Lloyd famous. Did you know that his frames contained no lenses? Perhaps he heard the story of Cho Tso.

Piston Ring Is Excellent Bearing Scraper

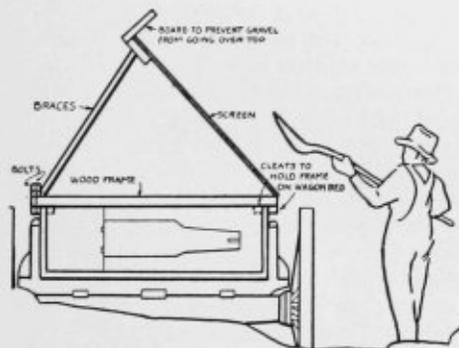
Bearing scrapers are delicate tools and it sometimes happens that when a bearing is to be scraped the tool is nicked, chattered, or otherwise damaged.

In this case use an old piston ring. By this is not meant one that has been worn out, but one that has been replaced by a new one because of the desire for higher compression. The ring will be found to have an edge fully as good as a scraper and can be grasped with both hands. Moreover, it will allow the user to see exactly where he is scraping. Further than that, the edge around the entire circumference can be used, and after that the ring can be turned over and the other edge used as well.

Screen Gravel at Its Source

Hauling gravel to the place it is to be used and then screening it is not a very efficient method.

A portable screen modeled after the one illustrated and made in lengths to fit the wagon bed on which it is to be mounted will screen the gravel as it is pitched into the wagon. The wire screen



This Arrangement of Heavy Screen on Your Wagon Will Assure the Loading of Only the Material You Can Use

should be of the proper mesh, so as to separate the large stones which are not desired.

The discarded material will roll down the incline of the screen and only the lighter gravel will fall into the wagon box. As the gravel would have to be screened in any event, this device saves the hauling of all unusable material.

Bit Handle for Working in Narrow Quarters

Sometimes it is necessary to bore a hole in a space too narrow to accommodate the length of a common bitbrace. In that case it is necessary to furnish a tool for the purpose. Here is one that will



be found excellent and of simple construction.

The "chuck" consists of a flat piece of steel about 6 inches long and 1 inch wide with a square hole in the center just large enough to fit over the square, tapered head of the bit without slipping

down over it to the round shank.

A bolt set at right angles to the face of the chuck, at each end, and covered with a loose-fitting piece of pipe, acts as a handle. The sketch shows how this arrangement looks when ready for use.

One hand or two can be used to turn the bit and a hole can be bored in a space about half that ordinarily required.

Strength Test for the Ford Magnets

Before tearing down a Ford magneto to hunt for unknown trouble, it may simplify matters greatly if the magnets are first tested out for strength. If found wanting, the investigation can be definite by the following method,

There is just one way to determine the strength of a magnet and that is to determine how much weight it will hold. In the case of a Ford magnet, it should be able to hold up a weight equal to that in a block of steel 39/16 inches long, 1 3/8 inches wide and 1 3/8 inches thick. This is the standard test.

If, however, you have no block of those dimensions, you can find the correct weight in another way. As it happens, a Ford camshaft gear weighs exactly what the aforesaid block weighs. Consequently, balance the weight of a gear on the scales with a piece of steel of any shape for the test and you have a testing block for future use.

Putting the Pop into Popular Songs

(Continued from page 199)

chestrations of "Smiles." Jobbers and dealers commenced to write and wire for copies, and the Woolworth stores, which had been unable to dispose of "Smiles" at less than two cents a copy, ordered in ten-thousand lots at six and one-half cents a copy. The song was later sold to another firm and eventually passed the two million mark.

When Robbins was released from service he went back to Richmond as manager and picked two hits in "Tell Me" and "La Veeda." For his excellent work he was taken in as a partner.

A little more than a year ago Robbins started to work on a waltz song called "Mello Cello," which he was certain would be a sensation. Six months later, after utilizing every device he knew to inject popularity into it, he discarded it at a loss of twenty thousand dollars.

The few thousand orchestrations Robbins issued on "Smiles" wouldn't be likely to start a dance hit today. Now a big publisher thinks nothing of printing and distributing from twenty-five to seventy-five thousand dance orchestrations of a number he is exploiting. And this is but one part of the work necessary to put over a big hit.

When a publisher releases a tune with a singable lyric he sends out high-salaried "act men" whose duty it is to talk or cajole vaudeville singers into visiting the professional studios to try out new songs, where you'll find a dozen or more piano rooms, with practically the same number of pianists in attendance. And unless an "act man" can bring in reputable singers quite regularly he won't hold his job long.

Joe, an act man for Blank & Company, may land a vaudeville headliner today, get him all set to feature a new song, only to discover a few days later that Bill, the "act getter" for Blim and Blim, has talked the headliner out of singing Blank's number and has interested him in one of Blim's. When the professional manager learns of this he goes to the mat with the act getter and demands an alibi.

In addition to act getters the publisher sends out crews of song pluggers who visit cabarets, dance halls, movie theaters and hotel grills, where they either sing the song or see that the orchestras play it. A plugger's job is to keep track of crowds which gather to sing, dance or be entertained and see that the songs his boss is working on get a good play.

And while act getters and pluggers are busy spreading propaganda, another high-salaried man keeps after the recording managers of phonograph and roll companies. He keeps the managers posted as to what is being done to make a song popular, because unless a publisher is able to create a demand the mechanical companies are averse to recording it.

In order to create a quick demand the big publishers maintain branch offices in all large cities, where staffs duplicate the work done by the main office. And all this missionary work is backed up by costly advertising in the various trade papers read by performers in all lines, recording managers, record, roll and sheet music dealers. Just as in every other line of business a publisher keeps salesmen on the road selling to the music dealers.

A song that becomes a real hit sells at least one million copies at an average of fifteen cents a copy—a total of one hundred fifty thousand dollars. Add fifty thousand dollars for mechanical royalties and you have approximately what a popular song hit earns.

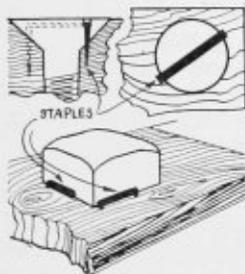
During the time a song is being exploited no one pays much attention to the author. But he says nothing and waits patiently until royalty day arrives. Then he gets a statement for two cents a copy, plus twenty-five per cent of the mechanical royalties. The cash is equally divided if two or more have written the hit. From a million-copy hit the writers would receive about thirty-two thousand dollars. Do you wonder why a million persons every year take a crack at writing popular songs?

Do not miss Rudolph Valentino's article, "What's the Matter with the Movies?" and William Fleming French's story about "Valentino, the Man" in the May Issue

How to Lock Screws

When things that receive a considerable amount of jar or strain are screwed together, it is frequently advisable to lock the screws so that they do not work loose. This may be done with the aid of small wire staples.

In the case of the wood screw drive the staple in across the slot, hammering or punching it well into the slot.



For coach bolts or wood bolts the staple may be placed across the corners, but it is better to drive two or more into the wood along the sides of the bolt head.

These methods of fastening bolts and screws are good to use on automobile work where there is danger of fastenings coming loose. Other work may be secured in a similar way.

Locating Distant Cannon

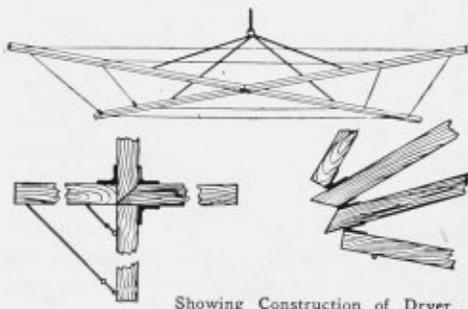
"Sound ranging" for the location of the enemy guns, as perfected during the World War, enabled American and allied troops to determine the position of German artillery with amazing accuracy.

The sound of gun-fire was collected by a number of microphones placed in scattered positions, usually in a trench, and connected with a central recording mechanism. When the microphone picked up a hostile gun explosion the shock was transmitted through several miles of wire and instantly recorded on a tape of photographic paper, calibrated to show fifths of seconds in time.

Six microphones were usually used, calling for six lines on the tape. The microphone nearest the explosion would be the first to pick up the concussion, and those more distant would pick it up in succession. By noting the difference in time between reports at the various lines, the observers were able to make calculations, based on the rate at which sound travels, and thus locate, by surveyors' triangulations, the distance of the gun from each microphone. By this means the location of guns could be determined within 50 or 60 feet.

Drying in Wet Weather

In April, when washing gets wet on the line outdoors, an indoor clothes dryer, which will be out of the way at all times, is a great boon. The one here shown is raised to the ceiling when loaded. When



Showing Construction of Dryer

not in use it is lowered, folded, removed from the rope which raises it—to which it is fastened by means of a snap hook—and made to disappear into a small corner somewhere. Two other snap hooks figure in its construction. They are placed on the lines and serve to hold the arms in their extended position by snapping to screw eyes in one of them.

The detail of the center, where the arms meet, illustrates the method of folding them when the hooks have been unfastened. This apparatus may be used right in the kitchen where there is sure to be warmth and a movement of air which will facilitate quick drying.

A Screw Driver for Inaccessible Places

A handy screw driver for placing screws in metal work which cannot easily be reached by the ordinary method may be made from two pieces of clock spring or, for smaller sizes, from watch spring by turning the ends of two pieces at a



right angle and riveting them together with a third piece between and setting the whole in a wooden handle.

The piece between allows them to be squeezed together to enter the screw slot. On releasing them they will spring out and hold the screw. An ordinary screw driver is used to make the final turns.

A Pioneer of Power

(Continued from page 192)

order to save a project Byllesby would, at times, have to operate it. In this capacity he learned much of the requirements of public service and put his finger on many of its weaknesses. He learned how to deal with the public, how to deal with governments and how to deal with politicians.

"The first thing necessary to efficient public service," he pointed out on many occasions, "is to get away from boodling, bribing and franchise grabbing. Instead of buying up legislators and getting legislation through by the special-favor route, a public service organization should deal squarely with the public and demand a fair deal in return."

This was a novel idea in those days, but from the very start Byllesby proved that it would work. With his record of accomplishment behind him, his reputation for integrity and the unlimited confidence and backing of the bankers, H. M. Byllesby was established. He was more than that, he was "sitting pretty," as the saying goes. He had now but to sit tight and collect his rewards.

But who ever heard of a pioneer sitting tight? There were more trails to blaze. For one thing, this versatile engineer had a modest little vision of his own. Just about as modest as the visions of his early fellow workers, Thomas Edison and Samuel Insull. He figured he would like to conceive, plan, build, own and operate a continent-wide string of public utilities.

The final cost of this little scheme of his might be two or three hundred million dollars but, as Governor Eberhart of Minnesota said of Byllesby, "what's a hundred million to a man who deals in light and gas meters?"

So, on the first day of the year 1902, H. M. Byllesby organized H. M. Byllesby & Company, of which he is still President and active head. Into this organization he brought the type of men experience had taught him would be essential to the planning, building, financing and operating of public utilities. This includes engineers, business men and bankers as well as experts in every department of construction, maintenance and operation.

The investment department of H. M. Byllesby and Company deals in public utility stocks and floats the financial end of the Byllesby projects.

So quietly and efficiently has this organization operated that few laymen are at all familiar with it. Yet it owns and operates the public utilities, electrical, hydroelectric and gas properties in over six hundred towns and cities.

At the age of sixty-four Colonel H. M. Byllesby is the active head of all this gigantic network of public utilities, and he is still pioneering and blazing trails.

To measure the worth or success of a man of this type by the amount of wealth he has accumulated, no matter how many millions that may be, is like attempting to measure music by its quantity. There are bigger things than accumulating wealth and Colonel Byllesby has done those bigger things, though he hasn't exactly gone into bankruptcy doing them.

Colonel Byllesby is a big man, a man who will probably tip the scales at two hundred pounds or more, and his powerful frame speaks eloquently of those days when he "hoofed" the mountain trails of the west, hunting hydroelectric power-plant sites.

He is the type of man who will not bother with details. He goes after the big things, tackles the toughest problems, and expects his subordinates to handle detail. They do! He has the courage of his convictions and the nerve to carry through. Once he undertakes a project it is because he has convinced himself that it is possible and practicable, and he will not let go until the job is completed.

Democratic in his business dealings and always ready to consider the other fellow's views, and his advice too, Colonel Byllesby's office door is always open to his business associates and his friends. But in his principles he is autocratic. To Colonel Byllesby right is right and wrong is wrong, and there is no such thing as a compromise. His ideals are high and he insists that his associates live up to them.

He is impatient of dicking or hair-splitting. He is a driving personality that demands action.

Here Is a Way to Make Artificial Ice

A perfect artificial ice for decorative purposes at home or at winter entertainments can be made with the aid of window glass, crepe paper, and mica snow. Choose a pale blue paper, lay it flat on the floor or table and rest the glass on top, stretching out all wrinkles except the natural lines of the crepe paper. After that, sprinkle the glass with flaked mica which can be procured at any ten-cent store. The finer the mica has been flaked, the better will be the result in giving a frosty effect. If cracks show between sheets of glass or in case broken pieces are used, disguise them by covering with cotton batting and sprinkle at the same time as the glass. Placing cotton in drifts along the edges also helps to hide seams.

This scheme has been successfully used in dressing a store window for a special display. The plate glass used was taken from the show cases where it has been in use as shelves. Blocks of glass have been used in show windows. With its bluish color, a thick block needs only to be painted with a thin solution of glue and water so as to retain the sparkle of mica on its sides.

New Thumb Tack Tool for Draftsmen

An ordinary pressed metal teaspoon will prove to be an effective help to the busy draftsman and others employed in work requiring the use of thumb tacks.

Simply cut off the handle part of the spoon about 2 inches from the top. Curl the remaining part around to make a convenient handle. Use the triangular file to make a notch about $\frac{1}{4}$ of an inch on the tip of the spoon. If the thumb tacks are pressed firmly on the paper, the notched end of the spoon should be filed sharp in order to get under the tacks. With the bottom of the bowl as a pivot for leverage, the thumb tack is easily removed.

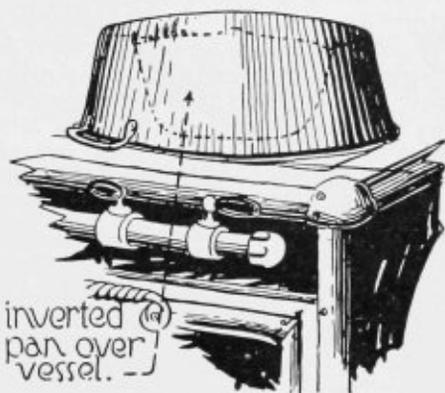
This little device will hold at least a half dozen tacks at one pulling. When not in use it may be hung in a convenient place. Not only are the tacks more easily



pulled, but your finger nails will be saved from being broken or loosening from the flesh of the fingers, which will add to your peace of mind and to the ease of your work.

This Household Hint Is a Gas Saver Anyone Can Use

As a means of saving gas on the open burners of a gas range, the writer believes the method used by a local house-



This Method Is a Very Simple One and Keeps the Warmth Where It Belongs

wife is of practical use and will save one third of the gas bill as claimed by the user. Over any pan or utensil being heated an inverted metal pan of larger size is placed. This confines the heat to all sides of the vessel over the burner and permits of reaching the cooking or boiling point with the flame turned lower. The heat which normally escapes upward is trapped to some extent and the waste heat utilized. A further claim is that sad or pressing irons will heat in half the time with the use of the inverted pan. This should work equally as well with blue flame kerosene stoves. Where gas or kerosene costs are an item for consideration, this is worth a trial. A pan unfit for other purposes could be used in this way.

This method for saving gas is unusually simple and is within the reach of every householder, for everyone has a pan of some description to put over the vessel in which the food is being heated. A pad for handling the hot pan should be provided, for it becomes quite hot and can thus be safely handled.

When the Eyes of the Man-Killer Blaze

(Continued from page 209)

blood-maddened brutes, diverting them to some extent. Other showmen wrenched at the end door of the cage only to find it latched on the inside! It seemed that the girl trainer must be torn to death before the eyes of helpless thousands, when a lumberjack broke through the crowd and smashed the door open with his ax. This man stood by with ax poised, ready to brain the first tiger that attempted to leap out, as the showmen dragged Mabel literally from the jaws of death. Then he disappeared, and nobody ever learned what he was doing in the streets of the city that day with an ax in his hand. Miss Stark wore high, leather boots, and, although they were slashed by the teeth and claws of the tigers and the flesh underneath lacerated cruelly, they, with the chair, saved her from fatal injury.

In a compartment in the forward end of the cage was the great Rajah, ten-thousand-dollar wrestling Royal Bengal, which Miss Stark had raised from babyhood. During the attack on his mistress, Rajah threw himself savagely at the bars separating him from the tigers seeking to devour the girl trainer, hurling himself with such force as to bend them six inches out of line, and they were three-quarter-inch steel set but two and one half inches apart! During the time that Miss Stark was in the hospital—a period of nine weeks—and since, she has maintained that Rajah would have fought for her that day. Some of the trainers who watched her careful and unprecedented rearing of the great performer, are inclined to think it possible, but the majority of wild-animal experts believe that Rajah at the time was inflamed with the jungle blood lust, and that he, too, was a killer that day.

With this circus there is another riding tiger, and its act is similar to that of Soudan. It was broken and trained by an Austrian, who returned to Vienna shortly after the outbreak of the world war. One of the features of the act was the tiger's jumping through hoops of fire, while riding about the ring on the elephant's back. Louis, the Austrian trainer, wore in the arena a gold be-decked blouse, which had once been the full dress coat of an enlisted man in the

old U.S. Army. Inside the neckband were hooks, arranged to support a white collar so that a uniform strip of white would show about the soldier's neck. Louis liked the idea, which saved a frugal Austrian laundry bill, but Louis took no chances whatsoever, always inserting a celluloid collar in the hooks. It was a neat, thrifty scheme, with a modest initial outlay and an upkeep cost of but five cents a season for a small sponge.

One night as the tiger leaped lightly from the elephant's back through a blazing hoop to a pedestal and from the pedestal through a second blazing hoop to the pachyderm's back, Louis turned to raise his cap and bow his acknowledgment of the audience's applause. At that moment a bit of flaming waste fell from a hoop and struck the back of Louis' celluloid collar. It might be said that the collar exploded in flames. Anyway, Louis bel-lowed in sudden agony and whirled, firing his pistol—at nothing. But in the Austrian's mind was a conviction, suddenly arrived at, but absolute. The tiger had him by the base of the skull, and its claws were raking his neck. As a matter of fact, that astounded creature crouched atop his ponderous mount wondering what it was all about.

The elephant man, guffawing at the trainer, who was threshing about like a mad dervish, rushed to his aid and tore at the throat of his blouse. Louis, half-blinded and crazed with pain, mistook the man for the tiger and harpooned him with his sharp pointed staff. The elephant man roared his disapproval of this boorish reception of his rescue essay, and knocked the Austrian cold, while five thousand people rocked in their seats in cruel glee. When Louis came to, he inquired of the show's doctor, who was soothing his badly baked neck, why the elephant man had let the elephant join in the attack. "I could have fought off the tiger," raged the Austrian, "if the elephant hadn't sapped me with his trunk!"

Once the late H. S. Rowe, owner of a well-known animal circus, was aiding a party of his men in a hunt for a tiger that had escaped from a shifting cage en route from Portland, Oregon, to Santa Cruz,

(Continued on page 310)



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When the Eyes of the Man-Killer Blaze

(Continued from page 308)

California. The tiger had taken to the lower slopes of Mt. Shasta, heavily covered with snow at that time of year. The search had continued for hours, when Rowe decided to return to Weed, a lumber town and the base for his party. Rowe had progressed but one hundred yards on the back trail, when the tiger sprang on him from a snow-laden clump of scrub pine ten feet away. The impact knocked the circus man into a draw filled with loosely packed snow. Rowe sank completely out of sight, and the tiger, startled, leaped away. The searching party had seen the attack, however, and hastened to pull their chief from the drift that had saved his life.

Rowe suffered not a scratch, and he claimed until his death that he was the only man who had ever received the full impact of a tiger's spring in the wild to survive; that is, where there was not instant rescue by rifle fire. No doubt his claim was correct, and he might have added that he was the only man ever to be attacked by a Royal Bengal tiger in a snow-covered country. The setting was certainly unique for a jungle-bred man-killer.

Much has been said and much of that might have been left unsaid, so far as truth is concerned, of the power of the human eye in the subduing and training of wild beasts. However, a fearless and unflinching eye means business to a lion, tiger or leopard, just as it does to man in altercation.

Last spring, Bernardi, a well-known trainer, was breaking a green lion. Alone in the arena with the beast for the first time, he spent an hour or so getting the animal accustomed to his presence. Then he undertook the first step in its education—indicating with great patience that he wished it to mount a heavy stool, which he kept close to it with his training staff, while he held the chair before his body for protection.

For an hour he worked to no avail, the lion attempting to evade him as he pressed closely in with chair and prod. Suddenly, the lion crouched, motionless. It was set to spring. As suddenly, Bernardi, chair and staff poised on guard, stood tense. Eyes locked, and for nearly

ten minutes neither man nor beast so much as flicked an eyelash. Then, slowly, almost imperceptibly, Bernardi backed toward the small arena door, his eyes still on those of the lion. When he reached the exit, he raised the latch without turning, his right hand holding chair and prod in position. His gaze never left that of the lion, which had not moved. Once outside, exhausted, he threw himself on the ground for over half an hour, regaining strength. Then the lesson began again exactly as before.

But of all the thrilling episodes in the circus wild-animal arena that of Louis Roth and the thirty fighting African lions stands unparalleled. Louis, a veteran trainer of "cat" animals, had with a wild-animal circus several years ago assembled the greatest number of lions ever seen in one act. When he had his charges seated on their pedestals in the big exhibition cage that sight alone was worth going miles to behold. And Louis seemed to handle and perform the magnificent Kings of Beasts easily and without strain.

One day as he stood in the midst of the group—perched on pedestals of all heights above his head and below—Congo and Prince, mighty cats seated on the highest pedestals in the center of the arena directly behind Roth, sprang at each other without warning. Roaring, growling, snarling, they fell, striking and biting, to the ground, knocking Roth down. Then a veritable tidal wave of lions cascaded from the pedestals, and a free-for-all fight among thirty full-grown Africans took place with Roth beneath the struggling, tearing, slashing mass of crazed creatures. Louis had but one chance for his life—to lie perfectly still. He did that, although he received forty-two rips and cuts. Finally, the combined efforts of all the animal men with the show, using firebrands, stopped the battle.

Louis was rescued, carried from the arena alive and conscious, but humiliated because he was too weak from loss of blood to walk out, as became the master, with that supreme confidence that real trainers of wild animals hold until the last breath.



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Sunshine for the Shut-Ins

(Continued from page 205)

Perhaps that is true in most cases—certainly the devising of all my equipment has been the result of stern necessity. I had to adapt my individual interests to the existing circumstances or virtually miss life altogether. I have no claim on the fame of genius. The outstanding characteristics of genius are marvelous skill and capacity for practical reasoning. Edison, Steinmetz, Tennyson, and Burns are examples of genius. Such men conceive conditions of forces and probable truths and possibilities without the whip of necessity.

I cannot reach eighteen inches in any direction from my face. My audion tube detector with two-stage amplifier receiving set is about two feet in length by six inches in height. To operate the instrument with my one hand I must have it directly over and across the bed, but even then I would be unable to reach the adjusting knobs if the set were placed on an ordinary extension-top table. Also I must arrange for the heavy storage battery and for the necessary movement of the entire outfit about the room. If I am to get the most satisfactory results with my radio I must operate it with my own hand, so that I can listen to concerts late at night while others in the household are asleep.

With the above circumstances in mind, I designed my special invalid's radio-phonograph stand with extension top over the bed. On the extension top is a second top pivoted in the center and resting on a roller so it can easily be turned back and forth. The receiving instruments are placed on a turntable device which is easily turned for convenient manipulation of the adjustments. The base of the stand is a sort of cabinet providing adequate space for the storage battery; the entire arrangement is mounted on ball-bearing rollers. Then with long, flexible cords as lead in and ground wires inside the room the equipment is easily moved

into position over my bed for use or rolled out of the way when desired. The adjustable mirror, described above, is also used in adjusting the instrument.

My radio was installed permanently on June 22, 1922, just three days after my fortieth birthday. From the very first I have been getting much highly worthwhile entertainment.

What if atmospheric conditions do interfere once in a while? I have heard of active people being disappointed in a show or theatrical performance. Still I notice the same people continue to take another chance. Several days after I got my set, "static" was in the air rather persistently. A friend who was listening with me remarked that if it were not for the unavoidable interference of static he would want a set of his own. I asked him if he refused fresh fruits and vegetables in season because they were sometimes not available during the winter. He has since stayed with me till twelve o'clock at night manifesting great interest in the distant stations I picked up. I think he is about converted.

Why if I were only able to get one good concert a week I would willingly bear with the six disappointments and work for the one entertainment, but I get worth-while results practically every night—and that during what is conceded to be the most unfavorable season of the year.

"What does radio mean to the invalid and lifetime shut-in?" It means, in part at least, that much of the bereavement incident to affliction has been overcome. In many cases the deprivations of affliction have been reduced to physical pain, confinement and mental anguish. We shut-ins cannot have personal contact with the customs and influences of the outside world, but radio has made it possible for us to have many of the most cheering and worth-while customs and influences come

(Continued on page 314)

Readers desiring further data concerning any article, news of which is published in this magazine, may obtain the information by addressing Inquiry Department, Illustrated World, Drexel Avenue and 58th Street, Chicago, Ill. The service is free and we are glad to have you avail yourself of it.—EDITOR.



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Sunshine for the Shut-Ins

(Continued from page 312)

to us. The term "shut-in" today does not bear half the dreadful meaning it did a few years ago.

I feel that one of the most promising features of radio in respect to chronic invalids and others is the opportunity for universal instruction on timely subjects of health and all. For instance, in case of an epidemic of disease in any form, radio is ideally adaptable to broadcast practical advice covering the situation to the infected communities. Instruction of this sort should be of vital importance to all the people; country doctors under such circumstances would likely welcome lectures on methods of the most effective treatment. I can easily imagine how radio in a few years will bring about a more contented attitude in the lives of many unfortunate people.

And the possibilities of administering aid to the stricken community in time of distress are equally practical in regard to community interests of all the people at all times. Various suggestions for business and industrial operations as well as domestic comforts in accord with the methods of the most efficient authorities of industry and progressive scientific thought are broadcasted daily by radio from many points of the country.

These practical instructions from progressive headquarters are above question. They are subject to the process of plausible reason. The same ideas are offered to great numbers of people at the same time; this must eventually result in uniformity of methods and cooperation in industry and social standards.

Radio gives me something new to look forward to each day, interests and oppor-

tunities of a variety which did not exist for me before. I enjoy associations with my friends to a greater extent, perhaps, than I enjoy the radio entertainments. I love company, but radio is ever present. The voices of those making the regular announcements at a number of the broadcasting stations are like acquaintances to me. I can't be an interesting fellow myself, but many friends do call to see me; often they are interested in radio so I turn the occasion into a radio entertainment for the benefit of all. With radio at my bedside, I seem to be living in a new and wonderful world.

What does radio mean to us who occupy the dimensions of one bed? I can conceive of only one event which might mean more to me in this life than the coming of radio, and that would be a miraculous return to health and strength. Possibly all invalids feel the same way. No doubt, radio has a more vital meaning to shut-ins than it has to the normal individual, but the great fundamental meaning is the same to all of us. God is at work in the world, and God continues to inspire man with infinite wisdom to work out at least a part of his own destiny. Man could not accomplish these wonders if an Infinite Creator had not first provided the means in possibilities and natural forces and then exercised inspirational influence to direct finite mind to discover them.

Radio means spiritual consolation, useful instruction, entertaining diversion and encouraging reason for hope for invalids and shut-ins. Radio at our ears is like the gentle whisper and soothing touch of the merciful Creator of mankind.

Mr. Harrison Wants Some Letters

Mr. Harrison's success with his specially designed bedside equipment and his wonderful optimism have led him to write this article and a letter. The letter says that "I was especially impressed by a suggestion that I might possibly help other shut-ins work out mechanical equipment which would add to the comfort of their existence. In adapting my instruments to help another shut-in, probably considerable modifications requiring thought and work would be necessary. I surely would like to do something like that and if I could get the particulars of some cases, I would gladly make drawings and make any suggestions which occurred to me. If I could be instrumental in working out something to improve the attitude toward life of just one unfortunate, it would add to my own contentment and happiness just as much as it would to his." Address your letters to him in care of The Editor, Illustrated World, Drexel Ave. and 58th Street, Chicago, Illinois.

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Harley-Davidson The Motorcycle

He Got the Only Picture

(Continued from page 224)

cause the leeches did not drink as much blood as escaped and soaked through my clothing. Several times a day we would cross swamps that were apparently bottomless, and in which were immense buffalo leeches called "lintas." Malay women behave themselves in the presence of a "linta" like some white women behave themselves in the presence of a mouse.

The deeper we penetrated into the jungle, the darker it became, and soon I saw some specimens of a large white butterfly that appeared to be about the size of a small plate. They flew very languidly, high up in the trees, giving perhaps three or four flaps a minute and floating the rest of the time. But soon our troubles began in earnest. One of the men yelled "Adoh! Tebuan!" The whole party scattered, baggage being dropped as we were individually chased by wasps, big black and red ones, at least four times as large as domestic ones in the United States. Unfortunately, several of the coolies in dashing along, disturbed several nests of smaller wasps which had stingers as big as the large ones. I counted no less than thirteen stings on my right hand alone. Thirteen always has been my unlucky number.

The next day three of the Malays developed fever and a halt was called. Ever since leaving Tembeling, I had kept a careful plan of our route, surveying as we went approximately with a watch and prismatic compass and by walking. The halt enabled me to take my bearings, and to discover that we were within twenty miles of the mountain. To revive the spirits of the wasp victims, I announced that we would have a feast. One of the coolies had a gong, another a tom tom, and two men had accordions. A very good German accordion can be purchased in Malay for less than two American dollars. Rice was boiled in large quantities, a dozen of my chickens had their heads cut off in the name of Allah, and great preparations were made for the occasion. Then old Mat Noh, my guide, appeared and calmly asked:

"Do you want a deer for your supper?"

It was very startling. After a steady diet of chicken three times a day, for several years, the offer of a deer was not to be lightly refused, so I responded in the affirmative and Mat Noh led the way in the jungle. He carried a parang, or knife, and I took a long shot gun. We made our way into the trees at right angles to the elephant track and soon came to a pretty glade formed by the falling of an immense tree, which had made an open space in the jungle. Although the tree had been on the ground for several years it was still alive and was in fact growing all along the trunk, which had become firmly rooted to the soil. Here I rested, while my guide commenced to build a little hut into which we crawled and covered ourselves with leaves. I stuck my gun through the side of the hut and then watched the old Malay. First he took from his belt two small sticks about a foot long. Then he selected a large leaf which he laid upon his lap. He rattled upon the leaf with the two sticks and made a noise like a drum. Suddenly he exclaimed:

"Look, sir!"

When I looked, I saw coming out of the jungle a beautiful deer. Then my guide made the rattling sound again, and this time the deer walked boldly into the open, with his hair standing stiffly upon his back, looked for a large leaf, and placing his feet upon it made a noise exactly like that being made by my Malay guide. First the man rattled on the leaf and then the deer, and every time that he did it, he walked a little bit closer to our hiding place. I raised my gun and fired. I could not help hitting him. Next I walked out, picked up the deer and put him in my pocket. That night I fried him for my supper. That deer was only about seven inches high—the ordinary height of a deer in the Malay peninsula. Growing from the upper jaw of the little deer were two very sharp ivory tusks about an inch and a half long and as sharp as needles. They resembled the spurs of a rooster. This remarkable deer apparently drums upon a leaf with his fore feet as a challenge to any other deer in the vicinity, and he

(Continued on page 318)

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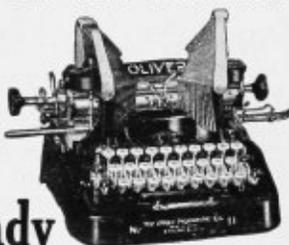
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He Got the Only Picture

(Continued from page 316)

is as easily deceived by the hunter as is the moose.

That evening, Mat Noh entertained me for several hours with stories of Malay folklore. He informed me that the deer was frequently accompanied by a small bird of bright plumage that danced in front of the deer, much to the latter's annoyance. "You see, sir," he said, "it is mother-in-law, and she is still annoying him." Apparently in the time of Solomon, from which the Malay dates everything, both the deer and the bird were human beings, the former being married to the latter's daughter. One day his mother-in-law was more than usually annoying and so was heartily cursed by her son-in-law. As a punishment they were changed into deer and bird respectively. Even today the bird continues to annoy the deer and there seems to be no escape.

After a few days rest, the journey to Gunung Tahan was continued. With the ground steadily rising, the temperature fell remarkably, so that at night the coolies suffered intensely from the cold. One morning there was great excitement on discovering a large fireplace, still warm. It was a fresh sleeping place which had been used by some of the jungle dwarfs. We were evidently in the midst of the district where these little people lived because, several times that day, we found their camps of the night before. One morning, Mat Noh and I set out together with the object of trying to photograph a mouse deer. We erected the usual shelter of leaves and at intervals Mat Noh would make the peculiar rattle call. My camera was in readiness when suddenly, without any warning and without the slightest noise an undersized man walked into the clearing. He was naked except for a small piece of bark and stood with his mouth open looking around him. Then he made a peculiar sound and in a most astonishing manner,

considering the thickness of the jungle, two women carrying babies appeared. They had thick lips, woolly hair and blackish gray skin, being still covered with ashes. The children were covered with jungle sores and wore necklaces of human teeth. Now and then the women would jerk the babies up in their slings made of bark and the babies would make grimaces of agony and tears would roll down their faces, but they did not cry.

My astonishment was so great that I did not realize at first that I was actually looking upon the jungle dwarfs whom I had been seeking for so many days. Quickly coming to my senses, I snapped the shutter on my camera. The man looked straight into the lens. One of the women looked behind her and then in a moment the three disappeared as quickly as they had come. They glided away with extraordinary speed and silence into the jungle. It was my first and last glimpse of the real Negrito or Jungle Dwarf in his savage state. That night the negative was developed and to my joy I discovered that with the exception of the man's right hand I had succeeded in photographing the whole group. I did not stop to use the view finder for fear they would escape. I took a chance and won. Having successfully achieved this object, I turned my attention to other matters.

The Malay jungle dwarfs have attracted the attention of naturalists all over the world, and as I am telling you this story now, an expedition from the Field Museum of Natural History of Chicago is on the way for the purpose of following up the efforts made by myself and other explorers to learn more about these strange people.

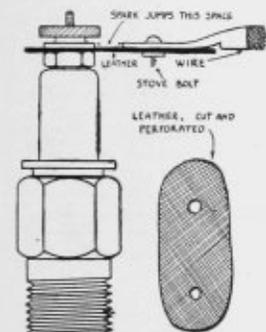
What the future will bring in the complete revelation of the life and habits of these people is indeed interesting. Science and natural history will be enriched when they become fully known.

In the May issue Rudolph Valentino gives the readers of ILLUSTRATED WORLD his personal message. In this he discusses "What's the Matter With Movies?" and tells you what he is willing to do to help remedy the present deplorable condition in the motion picture industry.

First Aid to Foul Plugs

There are numerous devices on the market to aid carboned, or broken, spark plugs in firing, but for emergencies the little piece of leather, herewith illustrated, will be found practical and thoroughly reliable.

An oval, $\frac{3}{4}$ inch wide and $1\frac{1}{4}$ inches long, is cut from a heavy piece of leather and perforated at *A* and *B* with holes large enough to receive a small stove bolt at one end and to engage the threaded



staff of the spark plug at the other. The leather is then placed on the plug, as shown, and the wire attached at the other end by means of the bolt. When in place, the brass clamp of the bolt should be about $\frac{1}{4}$ inch from the nut on the plug.

When the car is started, the spark at that plug will be observed to jump the space between wire and plug, producing the desired intensity, and the plug will fire in spite of accumulations of carbon or grease.

Mending a Cracked Crosscut Saw with a Rivet

With care, a not too badly kinked and cracked crosscut saw may be again straightened and made fit for use. The greatest trouble lies in the fact that the teeth may again twist out of line at the crack, particularly if, as often, the crack starts in the notch between two cutting teeth, for then there is a tendency for the chisel edge of the teeth to dig outwardly into the fiber of the wood being severed.

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Advertising Office:
Peoples Gas Building, Chicago

Publication Office:
Drexel Avenue and 58th St., Chicago, Illinois

Eastern Advertising Office:
171 Madison Ave., New York City

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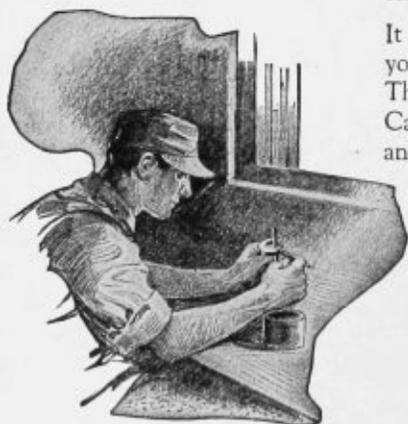
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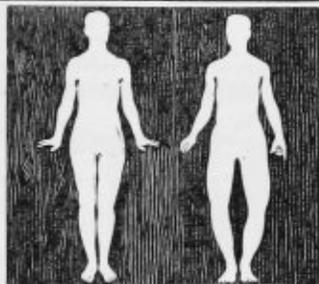
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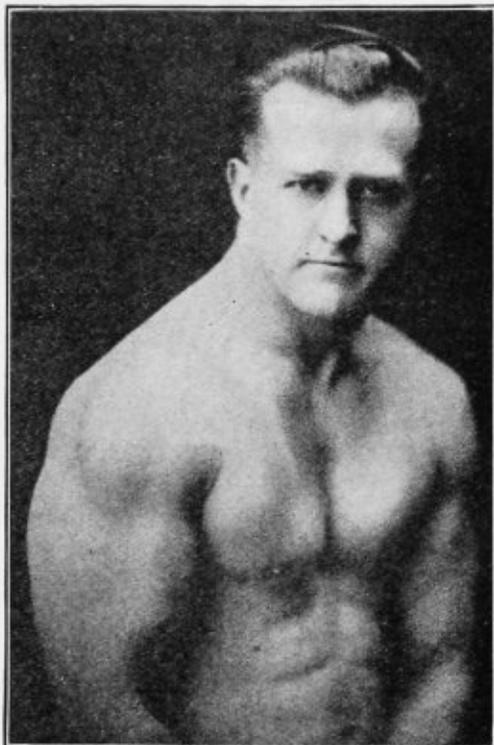
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Do You Know the Law?

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FREEDOM

Cut it out fellows. Get wise to yourself. If Adam had looked like some of you, Eve would have fed him poison ivy instead of apples. This foolishness will never get you anywhere but the graveyard. Get back to Nature's laws and be a real man. Pull in your belt and throw out your chest. Give your lungs a treat with that good pure oxygen all about you and you will get a better kick than you could get out of a whole case of whiskey.

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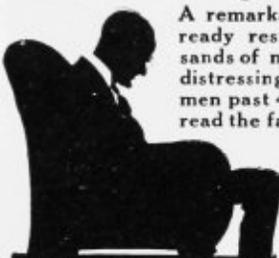
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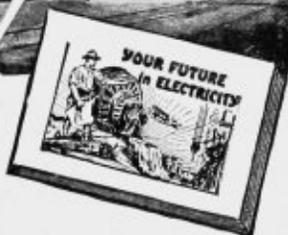
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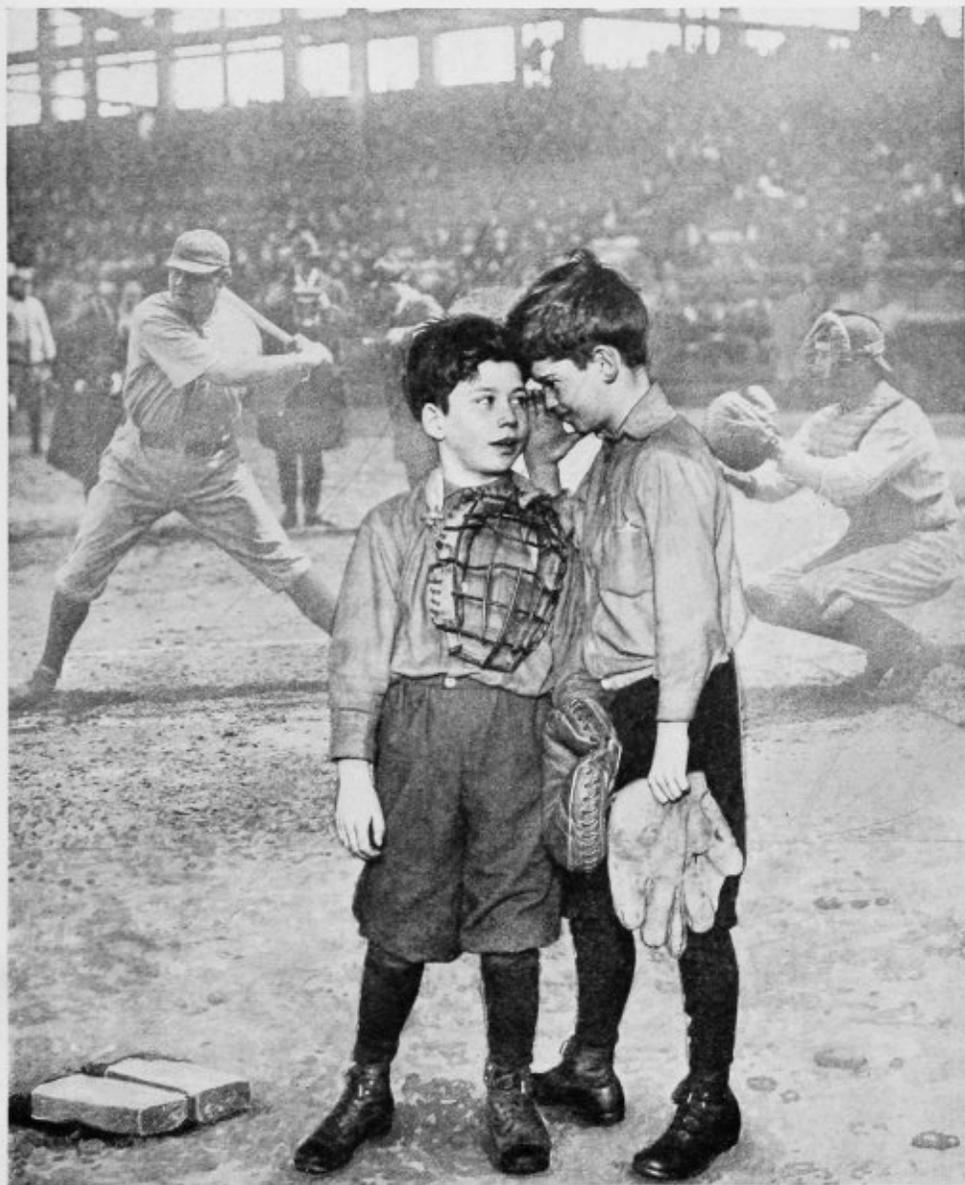
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Vol. XXXIX

MAY, 1923

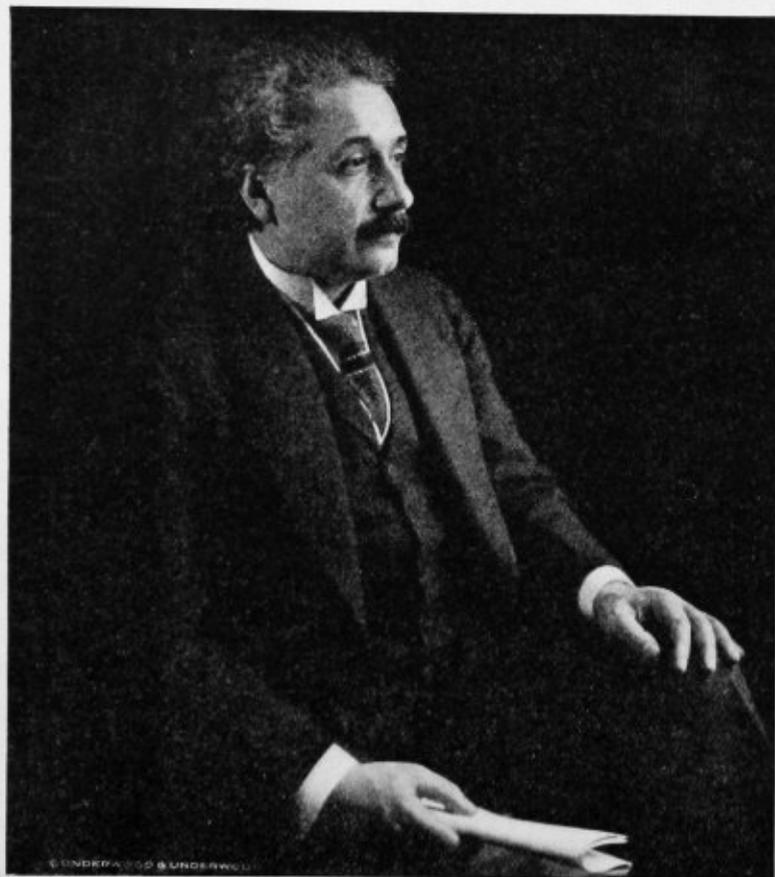
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A Sure Sign of Spring



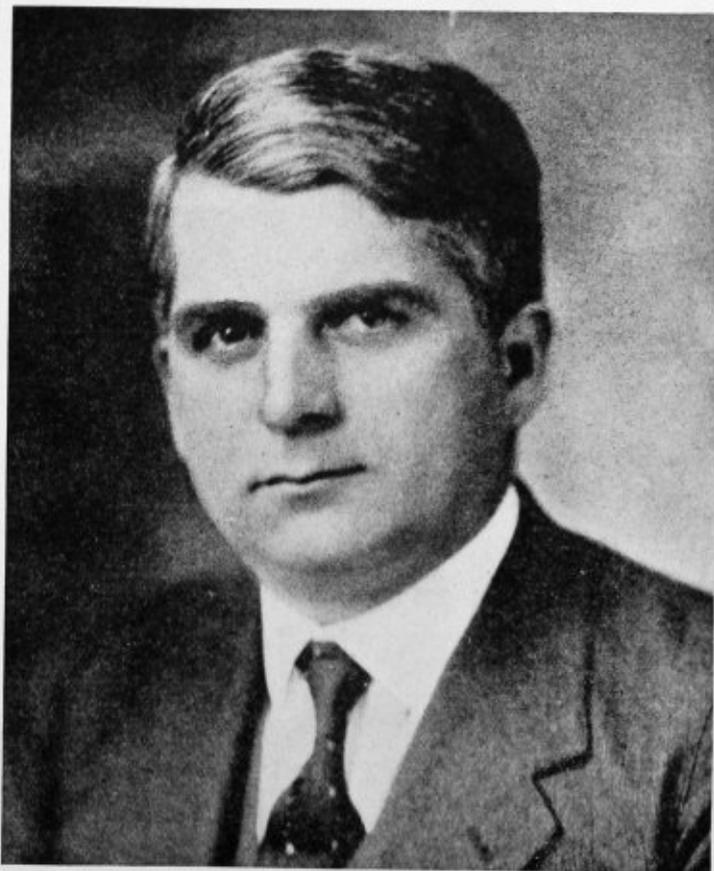
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Here's a Future Star Battery Holding a Secret Conference as the Babe Ruth of the Sand Lot Association Steps up to Bat—Just Like They Do in the Big Leagues. Will They "Pass" Him?



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Prof. Albert Einstein, Famous Savant, Has Announced a New Discovery Which May Create a Greater Sensation Than His Theory of Relativity. He Is Withholding the Details of the Discovery But Has Stated That It Concerns the Connection Between the Earth's Power of Attraction and Terrestrial Magnetism



Clarence Saunders, President of the Piggly Wiggly Stores Incorporated, Whose Recent Tussle with Wall Street Attracted Wide Attention. He Started from Nothing Twelve Years Ago, Being Employed as an Iron Peddler and as a Low-Salaried Grocery Clerk in His Younger Days. At Forty-Two He Is a Multi-Millionaire



UNDERWOOD & UNDERWOOD

Women as Dry Officers? "No" Declares Mrs. Annette Abbott Adams, of San Francisco, the First Woman Who Ever Held a Post as Assistant Attorney General of the United States. She Disagrees with Mrs. Gifford Pinchot Who Believes That a Complete Unit of Women for Prohibition Enforcement Would Bring Results



Miss Maud Royden, London's Most Popular Preacher, Visited Washington for the Meeting of the Women's International League for Peace and Freedom Having Come from the Meeting at The Hague in December Bringing Resolutions of the Emergency Peace Conference. It Is Said That No Woman of England Today Is Exercising Profounder Religious Influence



Sarah Bernhardt, the Eaglet in Rostand's L'Aiglon. In This Part Her Genius Gave • Renowned Presentation of Napoleonic Era and Tradition



Top—Photo of Sarah Bernhardt Taken in Her Suite at the Hotel Majestic, New York, During Her American Tour in 1916. She Was Then 71 Years of Age



Center—The Actress in New York in 1887, Taken with Lily Langtry. The Divine Sarah, Who Here Looks Like a Young Girl, Was Then Only 42 Years Old. She Was Born in Paris on Oct. 23, 1845 and Recently Died at the Age of 78 in the Arms of Her Son in Paris

The Countess of Carnarvon, Widow of the Earl of Carnarvon, the Noted Egyptologist and Discoverer of King Tutankhamen's Tomb. Lady Carnarvon Rushed to Her Husband's Bedside by Hydroplane But Was Forced to Descend and Proceed by Steamship to Cairo Where He Lay Stricken. In Her Race With Death, She Won by a Span of Several Days



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Ralph Breyer, of Northwestern University, the Swimming Sensation of the Year in Western College Circles. He Has Broken Several Records in the Western Conference—Possibly "Warming Up" to Go After Johnny Weismuller's Laurels

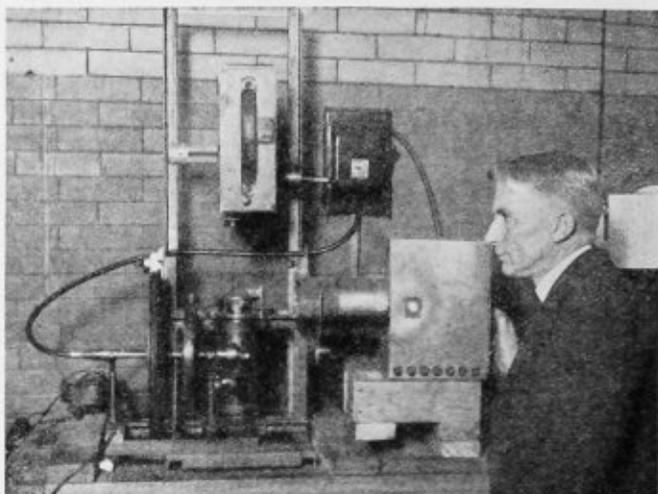


Joe Murray of San Francisco, Who Recently Won the National Handball Championship in the Tournament at St. Paul



Here's Mlle. Suzanne Lenglen, World's Champion Woman Tennis Player, in Action. Obviously, She Is at the Top of Her Form, as She Has Romped Away with the Honors in Recent Tournaments in France with Ease

The Scientific World Has Long Tried, But It Has Remained for Prof. W. D. Harkins of the University of Chicago (Right), to Successfully Separate Atoms—Smallest Electrically-bound Matter—Into Ions. Not Only Has Professor Harkins Been Able to Make the Separation, But He Has Improvised a Moving Picture Apparatus with Which He Has Been Able to Make Movies of the Process. Photo Shows Prof. Harkins and the Equipment with Which He Photographs the Explosion of Atoms Into Ions

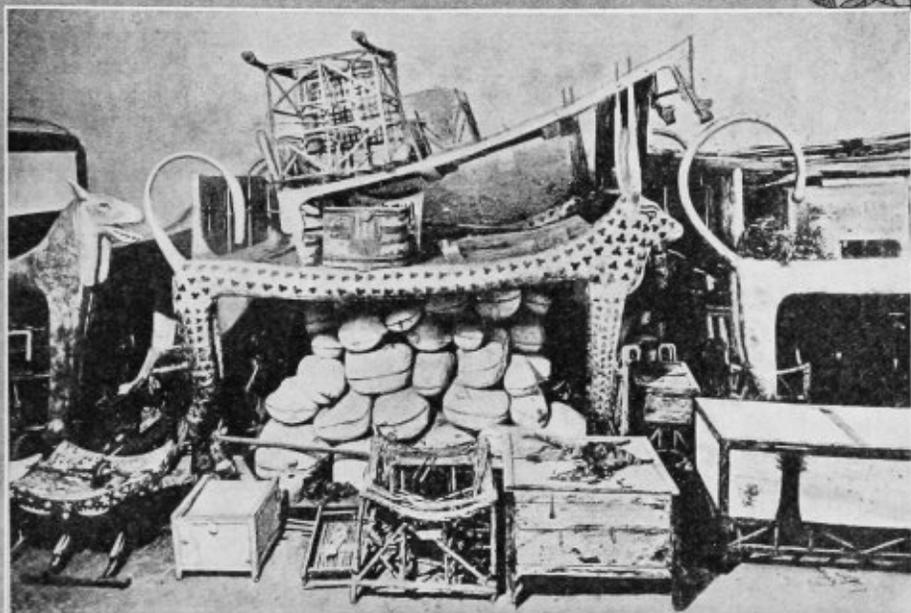


A Brand New French Idea Is Shown in the Small Fishing Boat in the Photo at Left. An Aerial Propeller Mounted on a Mast Is Connected by Rods to a Water Propeller, or Screw. It Is Said, That Even in a Light Breeze, Sufficient Power Is Gathered From the Air to Push the Boat Against the Wind, the Breeze Turning the Aerial Propeller and the Aerial Propeller Turning the Screw in the Stern of the Boat. As a Study in Natural Science This Presents an Interesting Problem—Utilization of the Power of the Wind Itself to Drive a Boat Against It

In Southern Utah the Jack Rabbits Are so Numerous That They Amount to a Veritable Pest. "Drives" Are Held Two or Three Times Each Winter to Capture Them. The Rabbits Are Driven Into Corrals and Then Killed with Clubs. There Are Three or Four Thousand Rabbits Shown in the Picture



Was He a Victim of a Pharaoh's Curse?



The recent death of Lord Carnarvon, Discoverer of King Tutankhamen's tomb in Egypt, has revived old beliefs of Egyptian mysticism that curses were laid by the ancient Egyptians with mystic incantations on any who dared disturb the sleep of a Pharaoh. Some students believe that he might have touched a poisoned object set in the tomb three thousand years ago to revenge the dead ruler on anyone who invaded his resting place. The illustrations show Lord Carnarvon, the entrance to the tomb (below), and an interior view of an ante-chamber



WHAT'S *the* MATTER *with the* MOVIES?

by RUDOLPH VALENTINO

THERE is nothing the matter with the movies that cannot be remedied. This is indeed fortunate—for the movie has earned an important place in

The principal trouble with the motion picture today is that it is an industry, not an art. It has been too highly commercialized for its own good. Of course, the

business man is necessary to the motion picture, but not to the exclusion of the artist.

It is right and good that Fords and locomotives and adding machines and safety razors and lead pencils shall be standardized and turned out according to hard and fast specifications—and that quantity production shall cut down overhead. It is also good business that the distributing station be standardized and handle the usual full line of equipment at standard prices.

But those methods are bad medicine for motion pictures. The film made to the dollar-ruled specification, turned out on a quantity production basis, added to the cut-

and-dried program and then released through the trust-controlled theatres is, without doubt, a specimen of efficient industrial production—but as an artistic entertainment it is a sad failure.

No one doubts that pictures can be produced under this highly efficient business method much cheaper and faster than by the old "hit-or-miss" artistic way—and that these pictures can net their producers and distributors a much larger



Rudolph Valentino

the life of the American public. No one will deny that motion pictures have been helpful, instructive and entertaining. No one doubts that they can be a great influence for good—or evil. And everyone knows they are too big to be ignored. They have assumed such importance as to incur a proportionate responsibility. And yet those entrusted with their development choose to close their eyes to the writing on the wall.

return per dollar invested than those handicapped by artistic requirements.

But, after all, what are you spending your money in your local moving-picture theatre for? To see artistic, fascinating pictures or to build fortunes for those in control of the industry? There the heart of the problem is exposed—the average moving-picture feature is made to fatten purses, not to entertain the public.

Commercial motion pictures have their rightful usage, as have also certain less artistic films of entertainment, just the same as commercial art has its proper place, and commercial music and jazz, and advertising and cheap vaudeville and burlesque.

But how would you like to discover the powers that be insisting that you must take your art and your music and your literature "according to our program." Suppose you went to Grand Opera and heard a little factory-produced opera, then a little jazz and then a half hour of song "plugging" flavored with ten minutes of Galli-Curci or Chaliapin singing a nursery rhyme. Or suppose when you purchased a set of Shakespeare you found every other page devoted to advertising or publicity writing or that your evening to Ethel Barrymore was four-fifths taken up by an act of cheap melodrama, a little burlesque, a bit from the minstrels and an acrobatic squad. Suppose that when you attempted to buy pictures for your home you discovered

they could only be shown in connection with commercial drawings.

Yet you get just about such a hodge-podge when you attend a motion picture theatre running trust-controlled programs. And with the trust growing stronger every day the little independent exhibitor is being driven farther and farther into the corner. All of which is very



Mrs. Rudolph (Winifred Hudnut) Valentino

fine for efficiency and profit, but very bad for art and entertainment.

In my opinion 75 per cent of the pictures shown today are a brazen insult to the public's intelligence. The other 25 per cent are produced by such masters as D. W. Griffith, Douglas Fairbanks, Mary Pickford, Charlie Chaplin, the Talmage interests—and the few other independent stars and producers who realize

that the making of pictures is an art, not an industry.

Such splendid features as "Broken Blossoms," "Way Down East," "Tolerable David," "Little Lord Fauntleroy," "Robin Hood," "The Kid," "When Knighthood Was In Flower," along with a few other productions; which rank among these, have invariably been received in such a way as to prove that the American public wants and appreciates artistic productions. The next thing to do is to demand them. The public always gets what it *demands*.

All of these pictures were produced by independent companies who loathe to follow the factory cut-and-dried methods perfected by the picture trusts.

The various stars and directors who have fought and dared to produce films of real merit are keeping faith with you in spite of the handicaps they face. They are courageously battling the interests that are monopolizing not only the production but the exhibition of motion pictures. They deserve your unqualified support. The only hope for the future of the moving picture lies in them. Support them and you will enjoy pictures made by conscientious producers, from real stories, pictures in which the artists have an opportunity to give you the best they have.

Under the present system the actor is treated like a factory hand—is driven helter-skelter through a picture by a director who is afraid of the slave-driving studio manager who, in turn, is spurred to increased production by producers. And these producers have but a single incentive—*profit*.

Such producers established themselves by imitating, in a superficial and insincere way, the artistic productions of D. W. Griffith, Mary Pickford and others by cashing in on their creative genius.

Then they were merely parasites. Now they are infinitely worse. Instead of merely imitating, they are attempting to crush the conscientious producer. And their method of crushing is efficient—as is every other business scheme they have worked out.

The blade with which they are trying to knife the producer of artistic pictures cuts two ways. First it hamstringing him and then it cuts off his lines of distribu-

tion. Process No. 1 is to discredit the stars that work with him and at the same time reduce to a minimum the value of the artistic production on which he is working.

The most efficient way to discredit stars is to make them common—to belittle their work; to prevent them from expressing their own interpretation of art; to compel them to perform poorly.

Name over to yourself a dozen of your favorite stars. When you think of moving picture stars you think of them. Now suppose that eight of that dozen were hired by powerful syndicates and put to work on cheap pictures. Suppose that the pictures they made were weak and their work was unconvincing.

Suppose each of them made four pictures, or even six or ten pictures, to every picture one of the other four made. In other words, suppose that of every ten pictures featuring your favorite stars nine were weak and the stars' work most disappointing. Wouldn't you begin to feel that, after all, it was not the star but the picture that counted?

And the method of discrediting real artistic feature pictures is as simple. D. W. Griffith produces a marvelous spectacle—the work of countless months of time and the genius of true artists. It impresses you mightily. You must see the next spectacle of that kind when it is released.

So the "industrial" producers figure. Before D. W. Griffith can produce another masterpiece they flood the theatres with dozens of cheap imitations, each heralded as the peer of Griffith's best work. So grossly are they misrepresented, so flagrantly are they mis-advertised and so miserably do they fall below your expectations that you naturally "swear off" spectacles for the rest of your life.

Who suffers? The conscientious producer. No matter how good it may be, his next production is almost guaranteed a failure, now.

Meanwhile the imitator flits to the next artistic production and proceeds to copy it, cheaply. In so doing he shackles a star to a weak part and then rushes him through with the picture, thus killing two birds with one stone. For the public

VALENTINO, THE MAN

An Intimate Sketch of the Famed Movie Star

by WILLIAM FLEMING FRENCH

IF you don't actually know Rudy there's no need to tell me what you think.

I'm away ahead of you. For if anyone was ever entitled to the honorary Presidency of The League For the Suppression of Rudolph Valentino, I'm the bozo.

Still, when a man writes for a living he does not always have his own personal choice of the individuals he is to interview. Besides, they told me I probably couldn't get within a mile of Rudolph without donning skirts—and that cheered me up considerably.

But apparently something went wrong, for I actually got into his suite in the Blackstone before he was out of his bawth. It began to look like I was elected, after all.

When Valentino appeared, he came hustling over to me with a perfectly good grin:

"Sorry I kept you waiting. Got a slow start this morning. Sit down," he continued, "and let's get going. I'm anxious to talk this thing over with you. You want to know if I can tell you what's the matter with the movies. I'll say I can. For one thing—"

And we were off to a good start.

The phone rang; the doorbell buzzed; somebody knocked and a letter slid under the door and skidded across the waxed floor.

But Signor Rodolpho Alfonzo Raffaello Pierre Filibert Guglielmi di Valentina d'Antonguolla kept right on talking. And I sat tight. An expectant bell-boy slid through the doorway with an extended tray of cigarettes. While Rodolpho, etc. was signing the slip I got a full breath.

"As I was saying," continued Valentino, "you can measure cloth by the foot but you can't measure art that way. Now you take in the picture, 'The Young Rajah.' It's hard to believe, but—"

"Really, Rodolph," interrupted Mrs. Valentino, holding her hand over the mouthpiece of the telephone, "you

shouldn't keep the district attorney waiting down there any longer."

Never have I seen anyone so closely resemble Irene Castle as does Mrs. Valentino. I had marvelled at the smooth speed with which the star's young wife had crossed the room to answer that



"Valentino," Says Mr. French, "Is a Modest, Deadly Earnest and Decidedly Likable Young Fellow With Nerve Enough to Fight for What He Thinks Is Right and Backbone Enough to Stick It Out"



Valentino in His Dancing Costume

phone, and in her every move I recognized the same slender grace and springy carriage; the same, almost imperceptible, shrug of the slender shoulders; the same quick, strong, certainty of action that characterizes the adorable Irene.

It was two hours since I had first seen Valentino, and now, as I left the room, I found in the hall a perfect mob awaiting him.

And just what sort of a man is Rudolph Valentino? Well, he's a man's man—a regular fellow. And he's a fighter, too. Don't think he isn't. There's another thing about Valentino. He has backbone—moral nerve. Under that pretty side part of his there's plenty of gray matter. And the boy is using it right now.

Physically, Valentino is, in my judgment, about the equal of Douglas Fairbanks. That's man size isn't it? Anyhow, I'm sure none of us would care to say to his face what we've chattered in his absence. Right now I have in mind an

individual who told me he had seen Valentino—knew him, in fact—and that he could “break that animated tailor's dummy” with his two hands. He should get religion and then try it!

Valentino is in a trying situation today. He is both the most popular and the most unpopular man in the country. To the average woman he is a little tin god. To the average man he's a mess. And that is because neither really knows him.

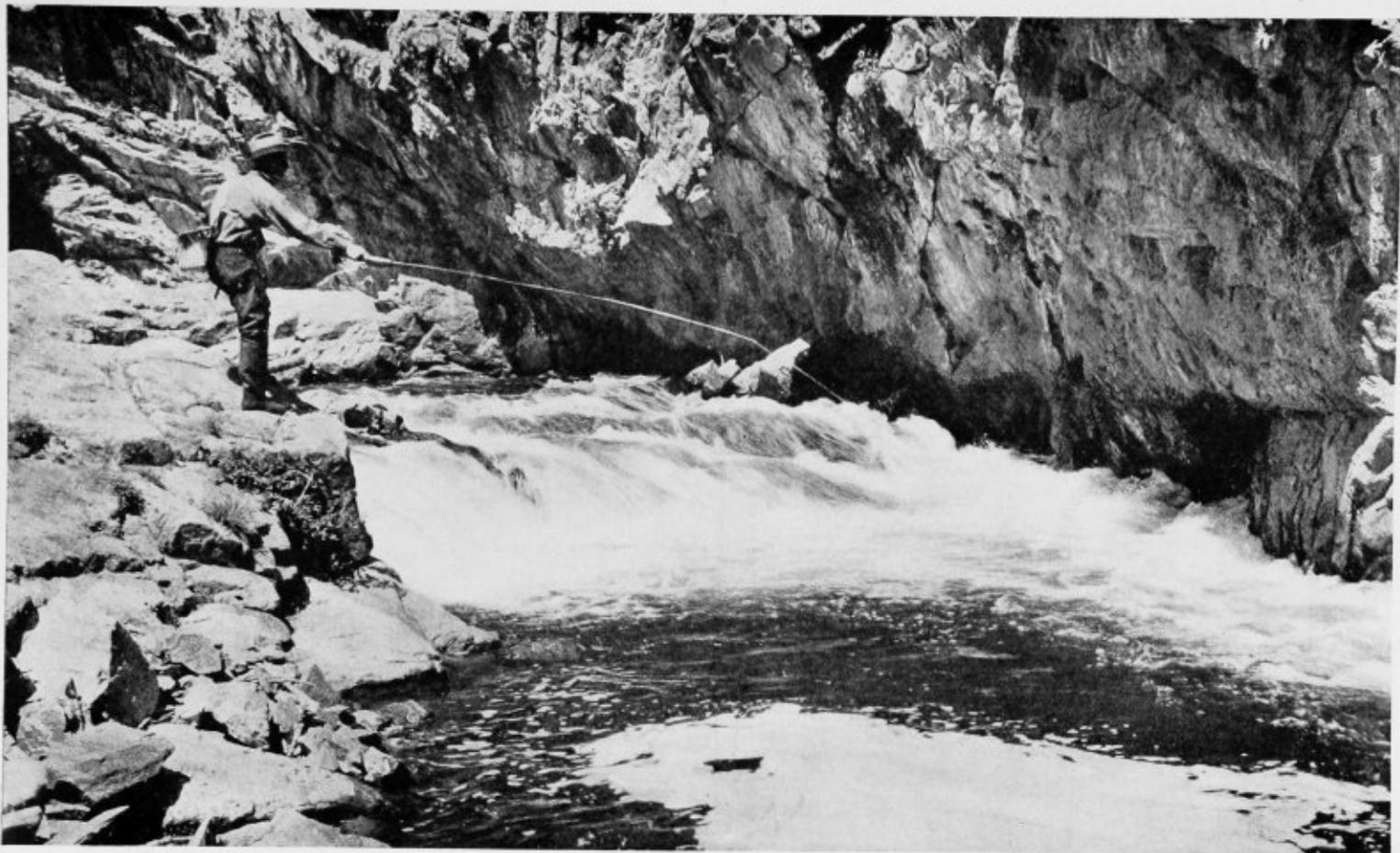
Far be it from me to shatter idols but, ladies, Rudolph is a long way from the impassioned Romeo you think him. And another thing; Rudolph isn't touring the country with his cute little Argentine orchestra and dancing himself ragged because he's just dying to give you a thrill, or because he “just loves to dance.” He's a regular he-man, and dancing isn't his idea of a perfect profession.

He is dancing because it is the only way he can make enough money to carry on the fight he is waging. And here is something for the American who loves fair play to think over: the producers Valentino is fighting got out an injunction that tied him hand and foot, so he couldn't go with another moving-picture concern, so he could not appear personally in moving-picture houses and so he could not go on the stage or do anything else that might enable him to earn an honest dollar. But somehow they missed one bet. He is able to dance, so he's dancing—and making a darned good job of it. But his heart isn't in dancing—not for a split second.

Valentino is fighting for better pictures. He refuses to caper before the camera again until he is assured that he will be featured in the sort of pictures that will give him a chance to use his art. Whether this particular star is right or not in this particular fight and whether he is going to win out or not is aside from the question just now. The point we want to realize is that he's standing on his own feet and fighting it out. He is playing a lone hand—and he is doing it with all the nerve in the world.

It surely seems funny we've forgotten our sense of fair play where he is concerned. Usually we admire a scrapper with nerve, especially when we find he started the fight on an empty pocketbook

(Continued on page 424)



Where Are You Going on Your Vacation? If You Have Ever Felt the "Strike" of a Game Fish, You Presumably Are Wishing That You Were in This Fellow's Boots Right Now

CARTOONIST VIEWPOINTS



ABOUT NOW

CHAS. KUHN in the INDIANAPOLIS NEWS



WOULDN'T IT BE A GOOD IDEA TO BUILD UP HIS STRENGTH A LITTLE BEFORE PERFORMING ANOTHER OPERATION ?

DARLING in the DES MOINES REGISTER



WHEN HENRY GETS TO BE PRESIDENT

DARLING in the DES MOINES REGISTER



COULDN'T CRACK IT !

THIERE in the SIOUX CITY TRIBUNE

OF THE WORLD'S DOINGS



SOMETHING BIGGER THAN PROFIT

by FRANK S. CHAMBERS

"AFTER all, gentlemen, you know there is something bigger than profit." Can you imagine the head of an international business organization tuning the policy of an institution to such a radical philosophy?

Radical! That's the word, for this individual is a radical. A radical for good. A radical for progress, for happiness, for success.

But such a policy! It would spell disaster in modern day competition. Sure. That's why it has built the largest business of its kind in existence; why more than fifteen thousand workers toil under its banner, and more are flocking to it daily.

This is a sure-enough success story. In fact, the story of one of America's most remarkable successes. But at that it is not going to mention dollars and cents at all—and the word power will not be used again in its telling. And though it is going to show you how to increase your profits and your personal gain it is going to do so quite unintentionally, for, after all, "there is something bigger than profit."

Twenty years ago a determined and self-reliant young woman stood before a scrupulously clean kitchen stove, conscientiously stirring the contents of an old-fashioned double boiler. This young woman was embarking upon a new business; she stood at the foot of the ladder that led to fame and fortune. She was a pioneer, ready to dare the trials of modern competition—risking her all in her belief, in her vision. (That all, incidentally, was something less than three hundred dollars).

Today she sits at a beautifully carved Chinese table, overlooking a suite of offices rich with the rare beauties of far-off Orient, in a Michigan Boulevard building which she has remodeled and decorated at a staggering figure. She is the head, the originator, of a gigantic chain of stores, more than five thousand of them; the owner of a world-famous manufacturing plant and the founder of an internationally known system of schools.

"Tell you the story of my life?" she said. "Not in a million years! Because there is no story to tell. I just plugged along until I got a good start. Naturally, I hope to get somewhere, to accomplish something worth while—but that's all in the future. I'm just at the foot of the stairs now. It has taken me all this time to get on the right road. If I succeed in staying on it and keep moving I'll have a story some day. But now—well; I'm sorry."

I'm not sure if she was sorry or not—but I'm dead certain she was adamant. So I looked up a particular friend of hers.

"Hasn't Mrs. Ruth J. Maurer a weak joint somewhere in her armor?" I asked. "Hasn't she a vulnerable spot in her make-up? Hasn't she a hobby?"

"I'll say she has. You just go back and get her on the subject of her school, on the subject of helping the underdog. Get her to talk about constructive thought and about success through right thinking. Then make a few inquiries about her schools and about the things she has done with women who were down and out. Then you'll learn enough about the head of Marinello to write a dozen stories."

And he was right. Mrs. Maurer, head of the Marinello system of stores, of the Marinello manufacturing plants and of the Marinello schools, is a gold mine of information and ideas for a writer.

While Mrs. Maurer is undoubtedly a keen business woman, "one of the shrewdest and most capable business executives I have ever known," says the president of a ten-million-dollar corporation, business to her is only a means to an end. And so is profit.

"Profit," says Mrs. Maurer, "is merely a tool—just something we work with. It is absolutely necessary to good work, but it is not as important as the work itself. Unfortunately most of us seem to think that the tool is more important than the work it can perform.

"Perhaps I have a strange viewpoint, but money in itself never meant anything to me. When a man begins to pile up

millions he loses my respect. It is wonderful to be able to marshal millions to work for you, but to accumulate them—just to enjoy their company—is not a very wonderful ambition.

"Of course we must be practical. We must do the work that mankind values. And when mankind values a thing it will pay for it. And that means profit. But that profit is intended to furnish us the necessities and luxuries of life; to make us comfortable and happy so we can do better work. When a profit does this and enables us to carry out our plans, it fulfills its mission. Any surplus is valueless.

progress, for new ideas. And many a conservative business man has shaken his head in despair when he learned of the way this woman scraps an old idea, regardless of the loss it may incur, in order to move forward, in order to put into use something a little better than that which has been winning profit for her.

But this is not the story of the building of the Marinello interests, but of the building of women, the building of happiness, of success. It deals with the "something" that is bigger than profit. It is Exhibit A, proving absolutely that the law of cause and effect is *inevitable*; that success and happiness are developed



Mrs. Maurer Personally Encourages Women in Their Efforts to Become Independent

"So I conduct my businesses to earn enough profit to permit those associated with me to be comfortable and happy and to enable me to carry out my plans. And I teach my pupils and my workers to do the same.

"That is why I sacrifice profit in order to try out new ideas; in order to go ahead—to progress."

And the funny thing about this woman is that she practices what she preaches. Her business is recognized as a sort of experimental or proving grounds for

through conscious effort the same as strong muscles and a keen brain; that the things we yearn for are ours for the *taking*—not for the wishing.

Briefly, Mrs. Maurer's hobby is to train women to be independent, to teach them to become self-supporting and self-respecting. And to do this she teaches them a business. First of all she gets down to fundamentals. She teaches the women who come to her to think right, then to develop character and then to make money. She recognizes the weak-

ness of the average woman and overcomes that before attempting to lead her into new fields.

There are two classes of women who come to Mrs. Maurer's mill: young girls starting in business and older women that have, through misfortune, been thrown back upon their own resources. The former she likes to train and give a good start. The latter, well, that's her hobby—and her real work! Remodeling and remaking women that fate has stunned with misfortune; first battling fear and discouragement, then teaching optimism and courage, and finally training her charges for independence.

And how many women in unfortunate circumstances has this cheery, confident, hustling little business woman, this shrewd judge of character and molder of personality, really picked out of the slough of despair and given a snappy push along the firm high road to success and happiness? A hundred? Five hundred would be closer to the mark. This pleasant genius of face cream and beauty tonic is in big business—don't forget that. She has trained thousands of women—and a large percentage of them were not rolling in wealth or good fortune when they turned to her.

How do they come to her, and where do they go from there? Here's an example. A young woman who had just lost her husband discovered that she had less than a thousand dollars insurance money left with which to support herself and little child. Numbed with sorrow, which gradually turned to despair, she carried on as best she could until her little fund dwindled to half its former size. Then, panic stricken, she sought work. She found it at three dollars a week. This however, was soon raised to six dollars. But six dollars a week is hardly enough to support a mother and child. Then she came under Mrs. Maurer's eye.

This woman went through the mill, with the shrewd, cheery individual in the front office urging, comforting, driving, leading her always on. When she came out of that school she had a different outlook upon life. Also she had confidence and a profession. Today she has a beauty establishment that nets her in the neighborhood of twenty thousand dollars a year.

Then there is another woman whose husband, a small-town physician, was not doing so well. She appealed to the woman who had accomplished wonders for some of her friends, came under her personal instruction and learned a new philosophy of life and a profession. Today she maintains three establishments, employs more than fifty operators and nets a yearly income that would turn many a corporation president green with envy.

And there are others, scores of them, who were penniless a few years ago and are now averaging more than ten thousand dollars a year—because they went through the "mill."

Last year Mrs. Maurer devoted half her time and spent a fortune on her hobby and she says: "Well, it was worth it." Then she smiled and her eyes sparkled. "I had a fortune's worth of fun out of it. Besides, don't think it won't pay me in the long run. It will—and in hard cash, too. For it gives me a chance to mold and train the women who are to represent me, who bring my product and my system to the public. They are my personal representatives. They reflect my institution and my personality to the public at large. In fact, they are my reputation.

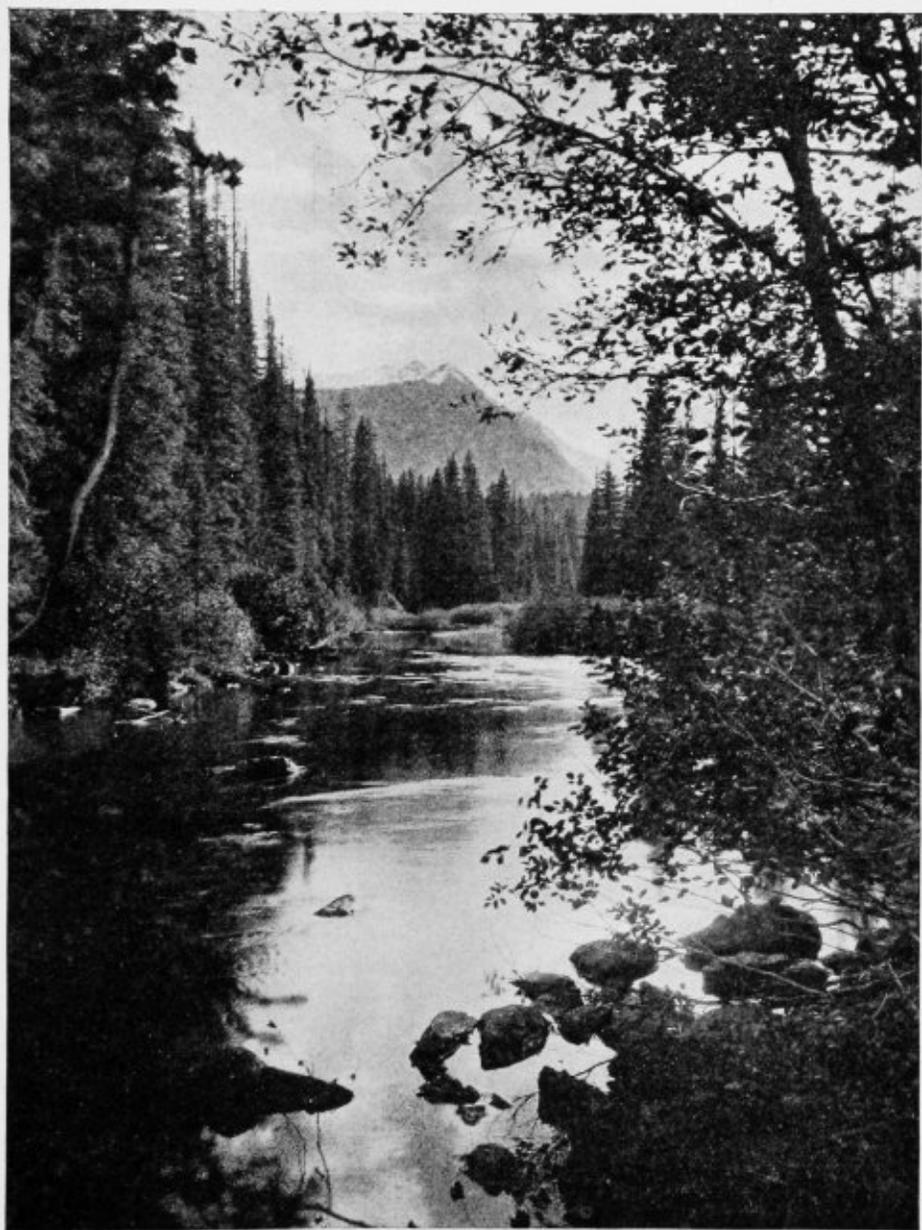
"The public doesn't know me, but it does know the women in the five thousand Marinello shops throughout the country. Those women have my reputation, my hope for the future, in their hands. So, you see, training them to success is not philanthropy on my part—it's just plain self-protection. I'm just a scheming business person—not a philanthropist at all."

However, her associates and those who have been under her influence have their own opinions regarding this little matter.

No one can deny that Mrs. Maurer's protegee pays out in the long run. Probably that's one reason why the smiling individual behind the big Chinese table is called one of our shrewdest little business leaders. But likewise no one who knows the real Mrs. Maurer would tolerate any but the belief that this woman would keep right on with her hobby of helping women to independence if it not only did not pay—but if it cost her the

(Continued on page 426)

Unnamed River in the Montana Rockies



© ARNOLD CURTIS—COURTESY NORTHERN PACIFIC RY.

Imagine a river in this widely explored country without a name! Stranger still is the fact that it flows through such marvelously beautiful surroundings—a magnet for the nature lover, camper, hunter, angler and mountaineer! It is located in the Rockies, north of Helena, Montana



A. L. Hale, Postmaster at Benson Landing, Vermont, for Fifty-three Years

HOW LONG CAN YOU STAY HAPPY ON ONE JOB?

To Be Contented, Say the Psychologists, Do Not Worry, Find a Position You Like and Stick to It. This Would Seem to Be Borne Out by the Careers of Some Americans Who Have Made Records for Long Service in One Kind of Work, and Who Are Hale, Hearty and Happy, in Spite of Years of Service at the Same Job

by GEORGE L. HOTCHKISS

SCIENTISTS have discovered that the tired business man is not merely tired but is suffering from a real disease and that the pace of life is too strenuous for the happiness that comes from perfect health of body and mind. A glance at the careers of some men who have held the same jobs for years seems to prove that such a course offers more in real human values than the restless change characterizing the lives of most other persons.

Here and there in this country are men who have shown that the Westerner is capable of carrying on in one job for years, hale and hearty, merry and capable. They proved psychologists were right when they recently declared that all this rush and hurry is a disease of the nerves, and the keeping in one place is not the sign of a stick-in-the-mud nor of a lack of energy, but on the contrary the sign of a control of energy, an ability to direct and govern it.

For instance, there is old "Bill" Critchlow, the world's oldest traveling salesman. Critchlow, who now makes his home in Shelbina, Missouri, is ninety-three years old. It is supposed to be harder to sell goods

on the road nowadays than ever before, as there is so much more competition and so many smart salesmen whose idea in working the line is to build up a clientele for themselves and then go into business. Old Bill, however, makes his route as regularly as any of the youngsters, and when it comes to "pep" he has enough to spare to some of the younger ones.

Mr. Critchlow declares that he has no rules for other people to follow so that they, too, can reach a similar ripe old age while remaining on one job. "I guess I got there because I did not worry about how to grow old painlessly. I've done just about what I wanted without bothering about rules." Mr. Critchlow admitted that he had not been a teetotaler, although he is strong for temperance. He is expert at all the known ways of using tobacco. "They used to say a traveling man couldn't live long," he continued. "The irregular living, the traveling, the eating and drinking, and all that, was supposed to encourage an early acquaintance with the undertaker. I guess there are travelers and travelers. I've been at it seventy odd years."

"Bill" Critchlow Has Been Traveling for Over Seventy Years



Known as "Happy Bill," Mr. Critchlow permits nothing to disturb him unduly. The only thing he can do to excess is be happy. He has some extraordinary tales to tell of the days when the drummers put up at old inns and sometimes when they were in hard luck they had to make their own camp as best they could. "Those were the good old days," to Bill.

The Reverend John G. Steen is another "long-timer" on the job. He is celebrating fifty-three years of service as rector of the Ascension Memorial Episcopal Church, New York City. Though no longer young, Reverend Steen is still in excellent physical condition and his parishioners declare that his sermons today are as soul-cheering and uplifting as any that he preached when he was a young man. He has no rules for long life except faith in the Almighty and acceptance of his guidance. "Believe that God's gift of life is good, stick at the job you like and serene happiness will be yours," he says.

In New England the oldest postmaster in the country—by some believed to be the oldest in the world—is still at it. For fifty-three years he has been sorting and delivering Uncle Sam's mail. A. L. Hale, of Benson Landing, Vermont, received his appointment in 1870, or shortly after the Civil War. Since then, in spite of the many changes of administration, his appointment has regularly been renewed. "Guess I'll stay here," he declares with a humerous twinkle in his eyes, "until the Socialists elect a president." To love of his work and temperate living Mr. Hale ascribes the fact that he is still able to carry on. "Don't excite yourself. I am always telling the young folks there is nothing to get excited over. It disturbs the constitution and the digestion and makes you old before your time."

Fifty-four years a railroad engineer, fifty of these mighty pleasant years on one road—the Chicago and Alton—is the record held by Charles Trimble and believed to be the world's record for a railroad engineer. In that time Mr. Trimble has covered over two million miles, equal to eighty times around the earth. He has never missed a day's service, is still on duty and has no idea of retiring although, if he wished, he could be retired at his regular salary. He attributes his career



Jake Kridner Is Seventy-four Years Old and Has Spent Forty-eight Years as Motorman on the Cincinnati Street Railway

of fifty years on one job to work, good habits and following the rules.

"There is somebody else that must be given credit, if you are thinking of long service at a steady job," suggested Mr. Trimble. "That's the missus. There are thousands of women in this country who have been at this job, and a mighty important one it is, for fifty years and over and they've never thought of quitting. What would we do if the mothers of the country thought of changing their work? I guess that is why women are happier and healthier than men on the average, even if they are not born so strong as men, I reckon that is why there are more widows than widowers in the world."

In the same class with Mr. Trimble is Jake Kridner who, it is claimed, is the oldest street-car motorman in this country, if not in the world. Mr. Kridner is seventy-four years old and has spent forty-eight years on the Cincinnati street railway. He has never been late and has never missed a day. He is known for his cheerfulness and is not yet completely gray. Often, in company with younger members of the force who show age more than he does, he is taken for one of the juniors in the crowd.

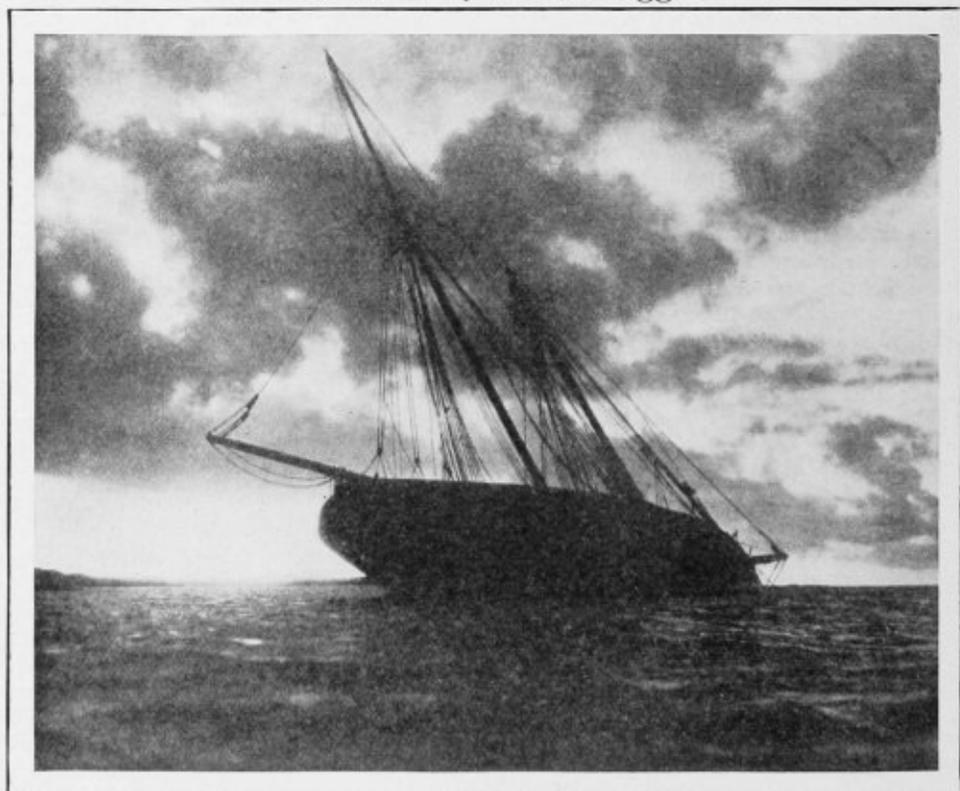
"When I was well on in the job," said Mr. Kridner, "some of the men would make fun of me. Many of the boys who thought I was a fool to stick so long are worse off than I am. A few of them went to the pen and others to the poor-house. Some of them are back here, after running around at other things, doing odd jobs and sweeping up. Some, of course, made good and I was the first to congratulate them; but of those who made good there are few who did not pay in worry and impatience for it. I have good health and a good home. I use no rules for good health and have done just about what I wanted to. It's lucky for me that I didn't want the things that would have been bad for me. I have many friends and know most of the people who ride on my lines. Knowing lots of folks helps to keep us cheerful."

John J. Jones has been a dining-car waiter for thirty-five years. It is said he is the oldest waiter in this line of service in the world. For the last twenty-five years he has run almost all the time on the "Congressional Limited" between New York and Washington. Although he has occasionally worked on other trains he has been known, during that time, as a "Congressional" man. He estimates that he has made more than nine thousand trips between New York and Washington and has traveled over two million miles on the "Congressional." Those who know Jones say that his most striking characteristics are a smile that won't come off and a continually happy and amiable manner.

How about you?

Would you be satisfied to stick in your present job for fifty years?

The Fate of a Bootlegger



This old Schooner, now in the harbor at Nassau, Bahama, is said to be the first "booze" ship to visit the Atlantic coast after the Eighteenth amendment went into effect. She now has been abandoned to a watery grave



Mr. and Mrs. Alexander Duncan of New Market, Iowa, shown with their baby grand-daughter, have been married for seventy-five years. Their motto is "Don't Worry"

Below—Knife-grinder who has cleverly rigged up a grindstone on an ordinary bicycle makes house to house calls. Supports similar to those of a motorcycle keep the bicycle erect while an extra chain attachment permits him to whirl the grinding wheel with the pedals



The coracle, the primitive craft of the ancient Britons, is still in use in certain parts of Great Britain, notably among the Welsh salmon fishers of the Towy river, near Carmarthen. The craft is navigated by means of a slender paddle and requires real skill to make progress



The Hindu Fakirs, those extraordinary sacred performers who have successfully continued to take hazardous risks without injury, still baffle science in India where their feats are being studied. The group shown in this illustration are holding up one of their number on a framework buttressed by short swords while he is getting ready to balance himself with his head on a knife point

THE MOST VALUABLE THING IN THE WORLD

by WILLIAM FLEMING FRENCH

Grace Anderson Orb, of ILLUSTRATED WORLD's staff of correspondents, presented in the April issue her views clearly and forcibly to the effect that the college woman is a misfit in the business world. Mr. French, who is nationally known as an educational and success feature writer, was asked to present the "other side" of the question.—The Editor

THE efficiency expert for the world's greatest merchandizing organization spoke earnestly:

"That is certainly good news, Miss Jordan. We are always eager to secure the services of college-trained men and women. In fact, we keep up a tireless search for them."

The *chic* young lady before him smiled happily.

"I knew that you would value college training," she enthused. "Tell me, please, how much more do we get, at the start, than the girls who have simply a common school or high school education?"

"Not one penny!"

"Wh—what?"

"Not a penny. You see, Miss Jordan, graduating from a college or university does not always mean that one is college trained, or that one has a college education. There is such a thing as getting through college without realizing what it is all about. There is such a thing as absorbing enough knowledge to pass examinations without actually learning how to use that knowledge. Also there is such a thing as failing to carry on once one is freed from the spur of the classroom recitation problem.

"The college graduate who has learned the greatest lesson college can teach—the art of consecutive, systematic and constructive thought—needs no handicap at the start of the race. She can start at the scratch with the others and set a pace that only the smartest can hold. And then, year by year, she can climb and climb and climb.

"The value of a college education is not so much what you learn as it is learning how to learn. Unless you have taken a scientific, technical or specialized training, the real value of your college educa-

tion lies in the fact that you have learned how to absorb, systematize and use knowledge. And systematized, harnessed knowledge is the most valuable thing in the world.

"You may well liken knowledge to a set of fine tools, and a college education to the skill to use them. The tools and the skill are worthless in themselves. It is the work they turn out that counts. Suppose a skilled carpenter brought a wonderful set of tools to your house. Would you pay him a premium to sit around and recite poetry, simply because he had the tools and the skill to use them? You would not.

"That's the way it is with us. We do not pay a premium for the privilege of hiring workers who come to us with college or university diplomas. But we do pay a most liberal premium to keep in our employ those who prove, by their work, that they have a college education—that they have learned how to learn.

"What we do promise college graduates who enter our employ is that we will watch their work closely and advance them as fast as they can learn; that we will review their work every three months and push them ahead, with increased pay, as often as their work justifies.

"It is only fair, however, to point out that we will do the same with the workers who have not the benefit of college training. But this is the point you should keep in mind: All things being equal the college-trained worker will travel twice as fast and go twice as far as her less fortunate sister. But we are not giving premiums or handicaps at the start. Frankly, a university diploma or degree means something less than nothing to me—though I doubt if anyone appreciates or values a college training any more.



PHOTO BY EMORY A. ATWELL STUDIO

William Fleming French

"If you are college trained, you will show it; if you are not, a diploma is a mere scrap of paper. By the same token, I've seen many a worker with the best training a college could give who never saw a diploma or the inside of a university—and many a worker with a diploma and no training. It is the training that counts, not the years you spend in college. And it is the training that will set the pace of your progress in the business world."

In discussing the relative value of women workers with and without college training, this expert who yearly hires thousands of employes says:

"All things being equal, the college-trained woman has a decided advantage over those who were compelled to enter employment without the advantages of some form of higher education. It is impossible to say how much more valuable a college-trained woman is to us—but I feel I am conservative in saying 50 per cent. That is, you understand, the average college-trained woman as compared to the average woman without college training.

"We have had in our employ college graduates who were practically worthless—and we have had, and still have, employes who never went higher than the

eighth grade who now possess educations equal to the best product any university can turn out. These people are self-educated and, of course, the self-educated person is the cream of all workers.

"Next to the self-educated individual give me the man or woman who has worked his or her way through college. That individual knows the value of training. He has made good before he ever comes to me. You are playing a sure thing when you hire such a worker. The worth and backbone of the individual who works his way through college has already been tested and stamped 100 per cent.

"Naturally, not all workers possessed of college diplomas are brilliant, and not all prove valuable workers. That is not the fault of the college, or of college training, but of the individual.

"That type of individual seems to feel that when she has been awarded a diploma she has learned her share. She is a college graduate—she is wise and smart and superior. She expects respect and admiration—for is she not learned? She apparently forgets that an education not backed by the desire to use it is like a racing car with an empty gasoline tank. Neither will travel fast nor far.

"It is this type of individual that turns certain employers against the college-trained, or at least makes them skeptical at the sight of a diploma. But when a college graduate looks upon her training for what it is, the skill to learn and the ability to use knowledge, she will go ahead fast and win big rewards."

Few employers have analyzed the question of college-trained vs. untrained employes as has this man. Few, very few, of them have occasion or opportunity to study workers as he must. Yet, back in their heads somewhere, they hold the same opinion—though they cannot express it.

I was talking to one of them the other day. He said:

"I don't know what to say about college-trained workers. No doubt they can do wonders if they settle down to it and don't think they are too clever to work for an ordinary plug like myself. But so blamed many of them think they have a corner on all the brains in the country that I just get sore and let them out.

"Just the same, though, I find that five of my seven department heads are college men whereas less than 15 per cent of my employes have graduated from colleges or universities. So I guess they must have the stuff when they want to use it.

"Had a funny experience along that line about a year ago. Had a girl come in here for work. Said she would do anything. That she had a trained brain and could learn any class of work.

"'College graduate, I suppose,' I shot at her, sarcastically.

"'Of course,' she replied, without batting an eye. 'Four years at Illinois and two years' post-graduate at Wisconsin. I took a general course at Illinois and specialized in history at Wisconsin.'

"'I'm making hardware, not teaching history,' I informed her.

"'But the little lady came right back at me.

"'I realized that, Mr. Clemens, when I saw those English period hinges you are putting out.'

"That caught me where I lived, because I jumped down my assistant's throat on that mistake a week before. Apparently she used her head, if not what discretion the good Lord had given her.

"'Anyhow, I hired her at eighteen dollars a week. She's getting sixty now and climbing fast. She is sort of fool killer for us. She goes over the things we plan to do and shoots holes in them for us. And you ought to see the mistakes she prevents.

"She told me that she went to college principally to learn how to think—to train herself to work on all sorts of problems. She is sort of official learner for us. If we want to learn anything we sick her on it and wait for results.

"'If she is a specimen of what a college can do, I'm for them. But you ought to hear her puncture the conceit of some of the college boys that come in here, all set to run the business.

"'College,' she tells 'em, 'is a sort of kindergarten that teaches you how to learn the lessons of real life. It is supposed to wind up your brain and start you thinking. You know, really, when you graduate from college you are only supposed to know how little you really know. The trouble with the average man unlucky enough not to go to college is

that he hasn't learned to learn and so doesn't realize how little he really knows.'

"Gosh!"—the big employer shook his head sadly—"I'd like to get some more college graduates like that lady."

Another employer interviewed had no doubts in his mind regarding the value of college-trained workers.

"If you get an intelligent, conscientious, hard-working college graduate you have the best type of employe possible to secure. If, on the other hand, you get someone who is conceited, smooth and lazy, not even a college course can save him. Chances are he either cheated his way through or crammed in just enough superficial learning to get by. He never got the real message college has to teach, at all.

"College is a place to train the mind, principally. True, you can learn certain professions or sciences, or even trades, there—but that knowledge of itself has no great value. It is the big thing that college teaches—how to think and to work—that makes that knowledge valuable to the college graduate.

"Having a college diploma doesn't mean you have a college education. But if you actually have a college education, whether you got it in college or elsewhere, you are the most valuable employe I can secure, and I'll pay big money to get you. You are worth twice as much to me as the fellow who has not been trained to use knowledge, twice as much, and then some."

A brilliant college professor throws the following light on the value of a college education, especially where women are concerned.

"You must learn before you can earn," is his practical introduction to the subject, "and, as I see it, the question is, are you going to learn in the pleasant environment of college or somewhere else not so pleasant. School and college education is the apprenticeship of the brain. There you teach the brain its trade—to learn and to think. The brain must be taught this before it can work for you. It actually starts its productive work after you leave college.

"But it is not wise to think that you can demand a large salary as soon as you leave college. That is not sensible. The

(Continued on page 438)

Finds New People in Volcano Crater

Mr. T. Alexander Barns, British scientist and lecturer, arrived in New York City recently with pictorial proof of his discovery of a hitherto unexplored Eden of giant colored folk who live in an enormous crater of the extinct volcano of Mount Kilman-garo, Africa

The men and women of this colony are unlike many of the other African tribes; they have regular features and possess superior intelligence. Mr. Barns spent some time in their colony and during his visit went on hunts by which he obtained several unusual and large gorilla specimens. Many other jungle beasts were met in the course of his travels. The photographs depict two interesting events of his journey

Right—The result of a gorilla hunt. A huge beast taken by Mr. Barns and his hunting party. The size of the gorilla is at once apparent

Below—Members of the chocolate colored giants of the volcano colony on a hunt in the jungle



PHOTOS © T. ALEXANDER BARNES



NEED A TONIC? TRY DR. UNDERFOOT

by CHARLES H. STANFORD



Dandelions Not
Only Furnish
Edible Greens, but
Make a Good
Spring Tonic

PHOTOS © KABEL & REBERT

THE American people spend over a hundred million dollars a year for patent medicines and tonics—ninetenths of which, according to medical authorities, are used to supplement insufficient foods or to correct abuses caused by improper diets. And mostly they fail their purpose.

The average American apparently realizes that he does not eat the right kind of food—for he is constantly resorting to tonics, "body builders," "invigorators," "stimulators" and various forms of concentrated vitamine foods. Regularly, every spring, several million of us turn our attention to spring tonics. Medical organizations, health departments, welfare organizations and others interested in our health urge us to forget these tonics and eat generously of fresh vegetables and fruits instead. These, they point out, are nature's own tonic; they are medicines from the world's greatest laboratory.

And yet few of us realize what wonderful properties these foods possess. We have come to regard vegetables as a sort of accompaniment for the consumption of meat or fish—not as real substantial food.

Here are a few facts regarding vegetables that we should remember. Not only the garden vegetables on sale in stores, but all the grasses and weeds included in plant life—much of which we scorn now—were at one time the sole food of man. Then he extended his diet to include a few other plant foods—fruits, herbs, roots and nuts.

Our own garden vegetables,—greens and "weeds," fruits and nuts—are the foods plant life affords us, and are the foods on which man thrived when he was far better physically than he now is. Man of those days may not have had the class of our present Apollo—but he certainly was a two-fisted, healthy individual. And he didn't have to eat red meat to get that way.

Early man was a vegetarian exclusively—no fowl, meat or fish for him. We find in the first chapter of Genesis the following:

"...Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in which is the fruit of a tree yielding seed; to you it shall be for meat.

"And to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth, wherein there is life, I have given every green herb for meat..."

Few of us look upon the green things of the earth as complete food. We do not think it possible that we could live exclusively upon the products of the vegetable garden and the vacant lot. But we could. In fact the very grasses and weeds that we look down upon would sustain us and keep us in health.

Read again the last five words of the above biblical quotation: "every green herb for meat." Yet thousands have died of starvation, scorning the life-giving grasses and weeds on every side. And even now hundreds of thousands in this enlightened country of ours are suffering—even dying—from diseases caused by

food deficiency; suffering and trampling underfoot the very foods that would save them. Rather extraordinary state of affairs, to say the least!

You know that thousands upon thousands are suffering from pellagra in our own southern states today; you know that thousands upon thousands have died from scurvy and that literally millions have been wiped out by beriberi. The green grasses and weeds underfoot are the positive cure for these diseases and for hundreds of others from which we suffer. And still we starve in a sea of food. We will soon see how these simple foods cure such dreaded diseases, but must first prove the value of the green herbs as real foods.

You know the perfect food, of course. The one food that will furnish all necessary nutritive qualities for the sustenance and growth of animal life is milk. You know this milk comes from the cow. And where does the cow get it? From the grasses and weeds she eats; from the green herbs. Not only does she get the nutritive qualities that go into milk from the grasses upon which she grazes but she also draws from them the elements necessary to sustain her own life and to make her flesh, her bones and her blood.

Thus we see that plant life is the perfect food for animals and, by the same token, animal life is the perfect food for plants. There are but two kinds of life—animal life and plant life. Each depends upon the other. Each operates directly opposite from the other.

Both animal life and plant life breathe—but see how differently, how exactly opposite they function. The animal draws oxygen out of the air (by breathing) that it may combine with the combi-



These Chefs Are Tasting Sorrel, Commonly Known As Sour Grass, a Weed Which Makes a Good Soup When Mixed With Milk and Potatoes

nations of carbon and hydrogen compounds produced by the combustion of food and carry away the gas resulting in the form of carbon dioxide. This constant, never-ending flow of oxygen purifies the body, taking away the poisonous gases.

Thus we take oxygen into our lungs and throw off carbon dioxide. If a man were put in an airtight vault say 10 by 10 by 10 feet, this process would soon consume all the oxygen in that space and fill it with carbon dioxide. The result would be suffocation. If the world were suddenly swept barren of plant life the animal life would turn

all the air into just such an impure mixture. But now plant life purifies the air by acting exactly the opposite of animal life. When plants breathe, they take up the carbon dioxide, use the particles of carbon and hydrogen for the making of starch, fiber and fats and throw off pure oxygen.

And in this process plants store within

(Continued on page 430)



While Gathering Weeds from the Fields for Good Wholesome Meals, the Chefs Never Overlook Mushrooms



Rainmaking and To Your

by O.M.

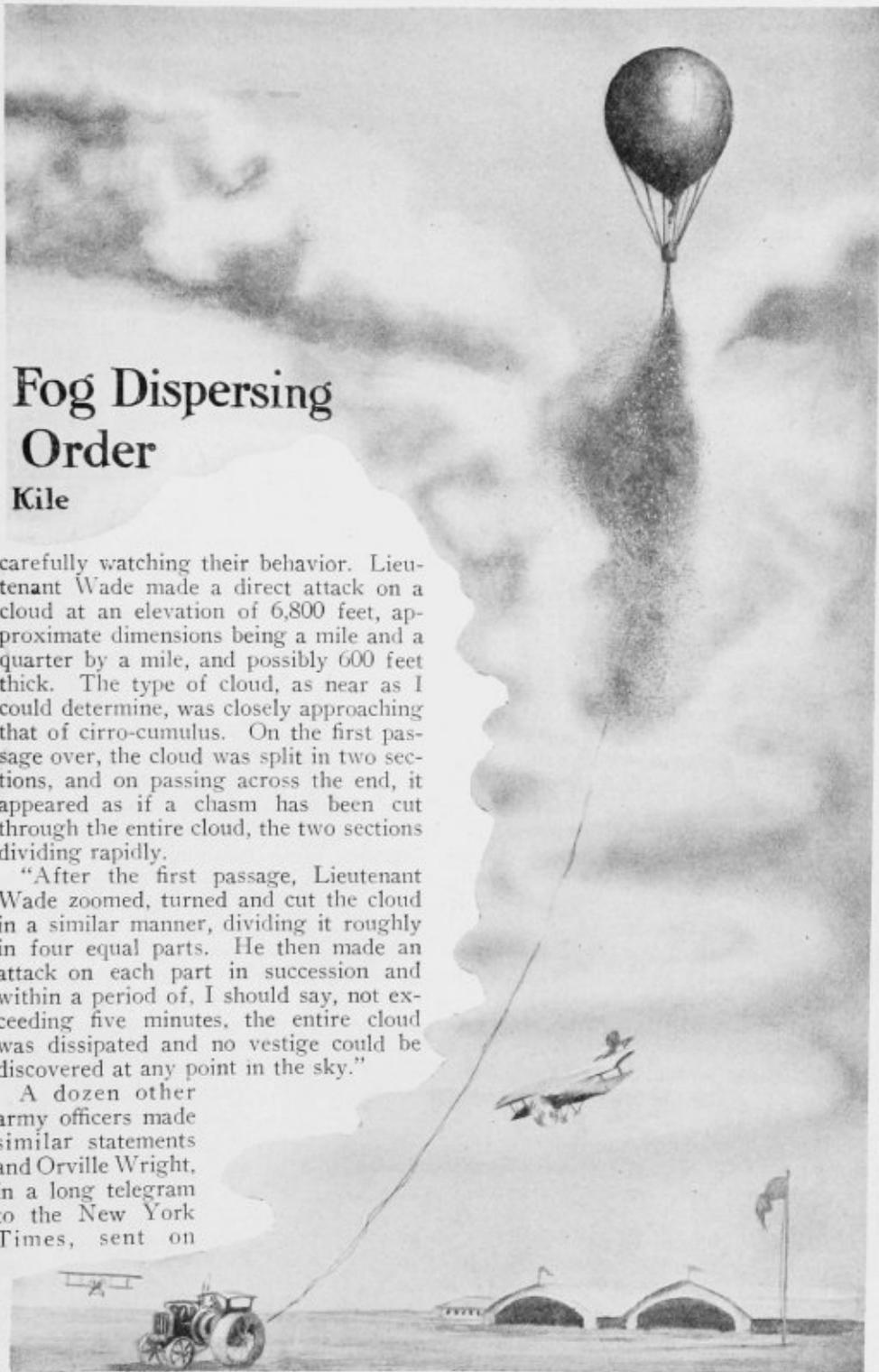
A REMARKABLE series of rainmaking and fog dispersing experiments have been conducted by Dr. L. Francis Warren, the inventor of the process, and Professor Wilder D. Bancroft, of Cornell University, who has assisted in the development of the invention, at McCook Flying Field, near Dayton, Ohio.

These experiments have been going on for the past year and a half and never yet have the experimenters failed in their attack upon a cloud. Announcements of results have been withheld from the public until very recently, as it was desired to have full supporting evidence. Rainmaking has been such a quack practice, heretofore, that the public is inclined to treat as a joke any new, unsupported announcement along that line.

Commander Karl Smith of the United States Navy, temporarily stationed at McCook Field to observe the experiments, in a sworn statement says:

"On Friday, August 4, 1922, I went into the air for the purpose of observing the operation of the invention of Dr. Warren for the annihilation of clouds and the precipitation of rainfall.

"The cloud destruction and rain precipitation flight was made by Lieutenant Wade, accompanied by one of Dr. Warren's assistants. During his flight, and accompanied by Lieutenant Price, I flew above and below the clouds,



Fog Dispensing Order

Kile

carefully watching their behavior. Lieutenant Wade made a direct attack on a cloud at an elevation of 6,800 feet, approximate dimensions being a mile and a quarter by a mile, and possibly 600 feet thick. The type of cloud, as near as I could determine, was closely approaching that of cirro-cumulus. On the first passage over, the cloud was split in two sections, and on passing across the end, it appeared as if a chasm has been cut through the entire cloud, the two sections dividing rapidly.

"After the first passage, Lieutenant Wade zoomed, turned and cut the cloud in a similar manner, dividing it roughly in four equal parts. He then made an attack on each part in succession and within a period of, I should say, not exceeding five minutes, the entire cloud was dissipated and no vestige could be discovered at any point in the sky."

A dozen other army officers made similar statements and Orville Wright, in a long telegram to the New York Times, sent on

February 16, corroborated these other observers and told how he, himself, had seen clouds completely dispersed in a very few minutes through use of Dr. Warren's processes.

But how does Warren do it? What new method of coping with and actually controlling Nature's forces, has he devised?

The answer is electrified sand.

Not very romantic sounding, is it? Yet its application to the practical problem carries romance a-plenty.

Picture to yourself a great ball park. The Giants are playing the Yanks. It is the world series. Sixty thousand people have paid in their money for high-priced tickets. A rain cloud appears in the offing. It approaches rapidly, getting blacker and more threatening each minute. A few drops patter down and strike the pitcher's face just as Babe Ruth steps up to bat. Manager McGraw has visions of handing out rain checks and having to do the whole thing over again tomorrow. The fans begin to grumble and the fellows who could get but a single afternoon off curse their ill luck roundly.

Suddenly an airplane appears in the distance. It rises until it is above the level of the storm cloud. Then it begins to circle and a stream of something that looks like dust comes trailing out behind and beneath the plane. This dustlike material seems to cut into the cloud like a huge knife. The disturbance started at the top of the cloud penetrates rapidly downward toward its under surface. It cuts through. Rain can be seen falling from this portion of the cloud a half mile or so off over the river. A rainbow appears in the sky.

Yet the big bombing plane high and dry above the nearer edge of the cloud keeps circling and discharging its dust-like magic. The rain continues in sight but comes no nearer. The cloud seems to dissolve and disappear into thin air. The game goes on. McGraw breathes a sigh of relief—so does the single-afternoon-off clerk.

Or, again, picture the farmer standing out on his back porch anxiously scanning the heavens, following the movements of the clouds with his eyes and praying that the long, long drought may be broken and his corn crop saved. If only those

clouds that float so tantalizingly overhead could be induced to drop a portion of their liquid burden! A modest shower would mean some new shoes and clothes for wife and children, a new coat of paint on the house—maybe a piano for the home. If only it would rain!

Then the new community cooperative rainplane comes into view, cutting its way through the cloud, apparently, yet flying well above it. The electrified sand streams down upon the cloud, patters lightly to the ground—and it rains!

Or, still again, think of the battle cruiser or a leviathan trying to make its way through an impenetrable fog. The airplane flying high overhead cuts a lane through the fog just as you might draw your finger through wet paint on a board and reveal the natural wood underneath.

Dr. Warren and some of his scientific advisers think that a single large plane could in thirty-five minutes erase the densest fog from all London and release the unfortunate inhabitants of that city from the necessity of groping their way about and actually bumping into lamp posts without seeing the feeble-flickering gas jets only a few feet above the level of their eyes.

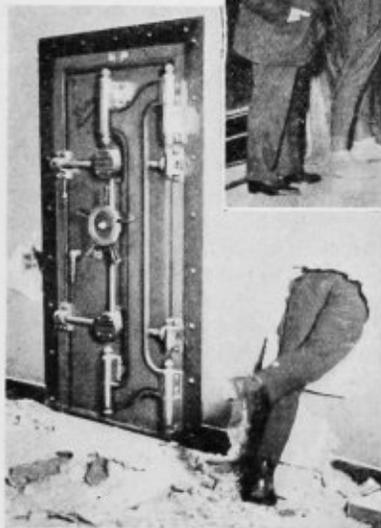
We can readily think of dozens of uses for this novel invention. But now let's go back and put a foundation under our "air" castles. The important thing now is to see what basis there is for anticipating their early consummation.

Contrary to the usual experiences in the early stages of a revolutionary invention, the first experiments have been extraordinarily successful. There seems to be no doubt whatever that cumulus clouds may be dispersed quickly, completely and economically. Fogs have likewise been dispersed. Further experiments are being conducted at the flying field at Moundsville, West Virginia, where fogs are thicker and more plentiful.

Precipitation, both as rain and as snow, has been produced on a number of occasions. Never in any large quantity, however. Often the rain produced has evaporated again before reaching the ground. All that Dr. Warren and Professor Bancroft claim to have done at this time is to disperse clouds and fogs and

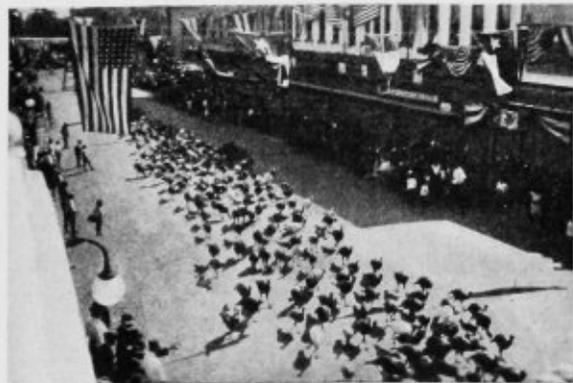
(Continued on page 432)

Below—After taking one look at the steel door to this vault, yeggmen abandoned their nitroglycerine outfit and burrowed their way through a thick wall and obtained more than \$10,000



Here are four of the New York police officials who were instrumental in having the animated rifle and pistol installed at police headquarters. From left to right are J. H. Hodgkinson, national commissioner on police welfare; Col. A. D. Martin; Commissioner J. M. Shaw and C. E. Scofield, military captain attached to police training school. The target is equipped with a device which throws motion pictures of police scuffling with crooks. Riflemen soon become adept at hitting the criminal without harming the officer. Every hit scored flashes as a small light for three seconds

Below—A feature of a recent Civic celebration in Victoria, Texas, was a turkey parade. The turkeys marched in good order and were a very popular innovation



These are the oldest watches in existence. In the center is the first watch ever constructed. It was the invention of Peter Heinlein, locksmith in Nuremburg, Germany, about the year 1520. The watch had the shape of an egg and was called the "Nuremburg Time-indicating Egg." Before the advent of the Heinlein watches, people used watches with sun-dials as shown in the two outer pictures

WHAT KEEPS MOST OF US STRAIGHT?

Is It the Desire to Do What the Conventions Say Is Right or Because We Haven't the "Sand" to Do Anything Else?

by MERLIN MOORE TAYLOR

MEMORY of childhood days brings back the picture of an old preacher—a kindly, tolerant man with an unusual understanding of humanity. He always ended his prayers with the Lord's Prayer, recited with a reverence and earnestness that never could be forgotten. Particularly did one notice the impressive pause before he delivered the words "And lead us not into temptation, but deliver us from evil."

Years afterwards, in answer to a question, he gave his reason. "Without pretending to quarrel with those who may believe that the parts of the Lord's Prayer which come first are the most important, I rather think that we poor mortals should emphasize the plea that we be not lead into temptation," he said. "We are naturally evil and the best we can hope to do is cut down the bad in us to a minimum. The more we are tempted to be our own true selves, the harder the task."

If he was right, and most of us are naturally bad, he was one of the shining examples of those who cut the bad down to a point where it was hard to find. But was he right? And if he was, what keeps the most of us good?

Recently a young bank employe was placed on trial for the theft of a few hundred dollars. He had been drawing a good salary, had excellent prospects, no troubles or worries of any kind and was engaged to a lovely, sensible girl. Yet he tossed all this aside for less than a thousand dollars—a mess of pottage, indeed.

Why did he do it? There seemed a thousand reasons why he should not have done it, not one reason why he should. The culprit himself merely shook his head and repeated: "I don't know why. I don't know why."

He stood at the bar of justice with bowed head and pleaded guilty. The judge was a man who tempered justice with mercy. Incidentally, he was neither a political accident who had been hoisted

into office by a machine nor was he a man who could be influenced by things that so frequently make our courts the opposite of what they are intended to be.

He listened courteously, but none the less impatiently, to the usual plea in similar cases—that the man who tampers with a bank must pay to the limit as an example to others.

"This court did not make the laws," he said rather informally when time came to pass sentence. "Its duty is to enforce the laws as they stand on the statute books. The defendant has broken one of these laws and must be punished. What the court is about to say is not to be taken in any way as an extenuation of the crime to which the defendant has pleaded guilty but merely as an explanation as to why the court sees fit to show what may appear unusual leniency in this case."

Then he dropped his legal manner, leaned forward confidentially and addressed the prisoner. "You have said that you do not know why you took this money. Most people would be tempted to sneer at you. Everything indicates that you are telling the truth. I believe you. Many years' study of human nature has convinced me that most of us are innately bad; that if we turn out respectable, decent and law-abiding it is a tremendous tribute to our will power and ability to overcome temptation to do wrong or it is because we never have been tempted strongly.

"I myself often have been puzzled by what may be termed 'that guilty feeling.' Never to my knowledge have I wittingly broken a law. Yet I never pass a policeman without an inward shrinking and a feeling that if I had my just deserts he would seize me and clap me in jail. From childhood to old age we are moved by the impulse to rush into denials of our own guilt if we hear an accusation of wrongdoing, even though we are fully aware that it is not directed against us and that we are not even suspected.

"Never was there a truer thing than



"What Keeps Us from Doing Those Things
that We Are Urged from Within to Do?"

'as a man thinks, so he is.' If we could be punished, except mentally, for the evil that we think as well as the evil that we do, none of us would go unscathed. What keeps us, then, from doing those things that we are urged from within to do? Fear of the punishment that may follow—for the most part. Sometimes it is cowardice of another kind. Remove the fear of punishment and the reigns of terror which have broken out in various stages of history would seem like pink teas by comparison.

"So it was in your case. Tempted too strongly to take what was not yours and the fear of punishment removed momentarily as a part of that temptation, you fell. How many of us, under similar conditions, would not have done the same?"

He passed the lightest sentence under the law and paroled the offender. But was he right in what he said?

Some three hundred years ago Hobbes, a deep thinker and writer of the seventeenth century, conspicuously upheld the theory that human nature is primarily selfish, which is one form of "bad." Shaftesbury, another thinker and writer, replied. Since then almost every ethical writer of any importance has had something to say on one side or the other. The argument has been raging for three centuries. No doubt it will go on until the end of time.

Dr. James H. Tufts, head of the department of philosophy at the University of Chicago, points out that "modern

writers for the most part would say that we have a great variety of instincts and impulsive tendencies which are neither good nor bad in so far as they imply any conscious attitude, but that we become good or bad as the result of a long series of choices, into which enter a great variety of influences."

Robert H. Gault of Northwestern University and secretary of the American Institute of Criminal Law and Criminology, says: "Some folks stay good because we are conventional. Perhaps there is another thing mixed up with this, namely, a lack of sufficient sand to do anything else but run along with the herd with which our lot happens to be cast. I think some support can be found for that in the fact—I believe it is a fact—that many people stick to a profession or an occupation mainly because they dislike running against the conventions of their professional or occupational group. I do not believe that we are specifically either good or bad in the sense in which these words are commonly used. What is good or what is bad is a more or less highly conventionalized creation."

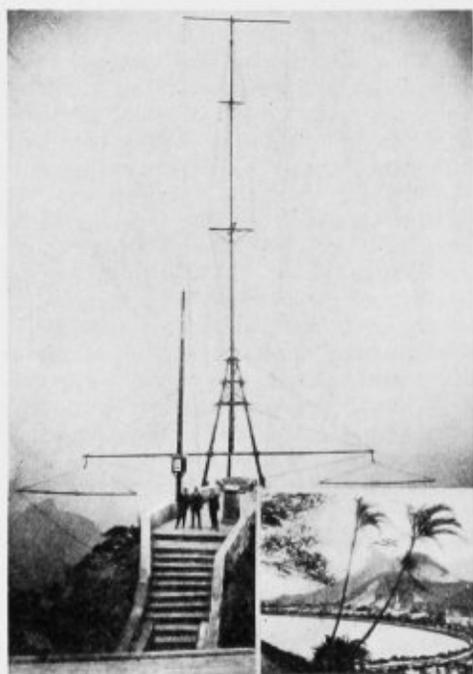
Arthur Sullivant Hoffman, an editor of many years' experience in fiction and admittedly a student of human nature who has made a success of it, recently wrote a book of advice to writers in which he said something pertinent. He was pointing out that to write a successful story and please the greatest number

(Continued on page 434)



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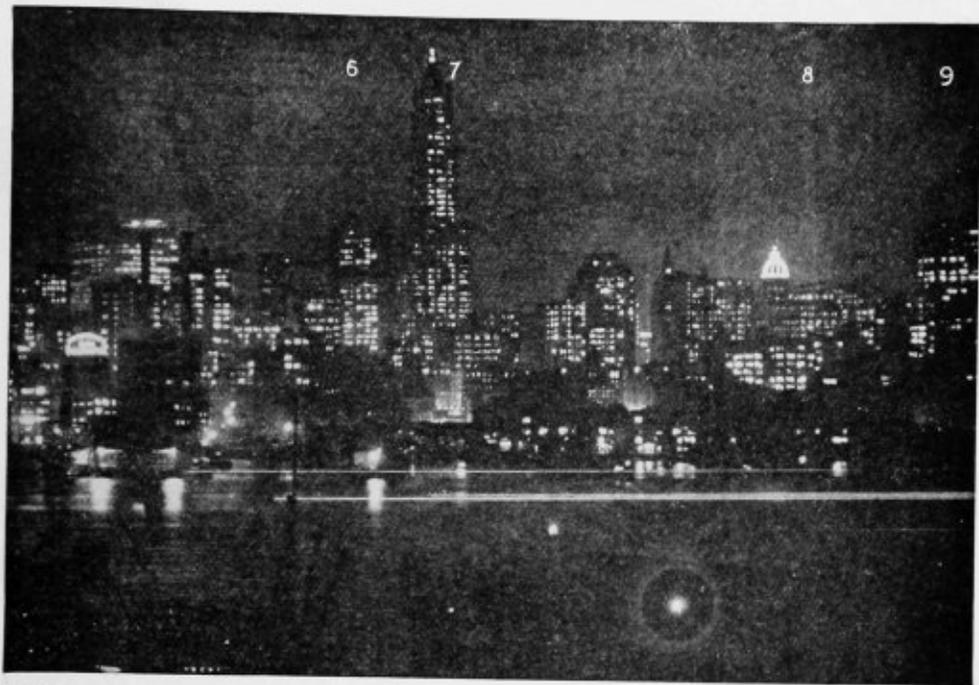
When Evening Shadows Fall on New York City. The Towers Are: 1. Seaman's Institute; 2. White Hall
9. Brooklyn



The Tower of the Highest Broadcasting Station in the World on Mount Corcovada, Brazil. Insert Shows the Station—SPC—as Seen From Rio de Janeiro



Here's William Jennings Bryan Being Made a Boy Scout "Tenderfoot" at a Recent Rally in Miami, Florida

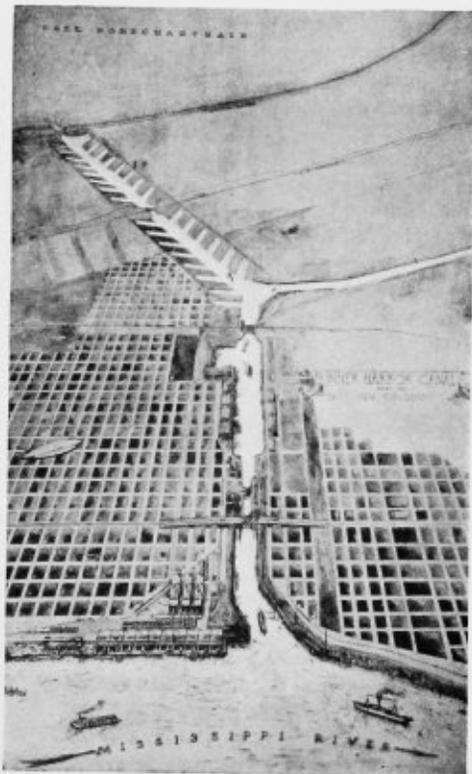


Building; 3. Guaranty Trust; 4. Equitable; 5. Singer; 6. Park Row; 7. Woolworth; 8. World Dome, and Bridge Plaza

Bird's Eye-View of New Orleans' \$20,000,000 Industrial Canal and Inner Harbor Recently Opened Between the Mississippi River and Lake Pontchartrain. Ultimately a 45-Foot Ship Channel Will Be Dug Through the Lake to the Gulf of Mexico, Thus Greatly Shortening the Distance From New Orleans to the Sea



You Probably Do Not See Julia Marlowe and E. H. Sothorn, Famed Stage Stars, in Their Street Clothes Very Often. They Recently Returned From a Long Visit to England and France



GRIZZLY HUNTING *a la* ROBIN HOOD

Out where the West begins, four men have revived the mighty long-bow of the Saxons and converted it into a hunting arm. Armed only with bows and arrows, they recently hunted in the mountain fastnesses of Wyoming and returned with the skins of five grizzly bears, one of which weighed more than a thousand pounds, all killed with the 28-inch, steel-tipped arrows, driven from 6-foot yew bows. Dr. Pope led this party

Dr. Saxton T. Pope, the Modern Robin Hood, and a Black Bear Which He Killed with the Bow and Arrow Shown in His Hands

by DR. SAXTON
T. POPE



THE very thought of shooting grizzly bears with a bow and arrow strikes most people as being so absurd that they laugh at the mention of it. The mental picture of the puny little archery implements of childhood opposed to the strength and ferocity of an animal which, full grown and in its prime, could destroy an African lion in open combat, incites incredulity. Yet those of us who are using the bow and arrow as hunting implements every year not only attempted this feat but accomplished it, and the mounted skins of our grizzlies stand today in the habitat group of those animals in the California Academy of Sciences in San Francisco. In fact, it was to obtain these animals—now extinct in California—for this scientific institution, that we set out upon the most dangerous of all our hunting trips.

To find the grizzlies in their wild and undisturbed condition, we entered the mountain fastnesses through Yellowstone Park, in order to have the advantage of good roads for the transportation of our camp equipment as far as possible. None of the bears killed, however, were "hotel bears" or "park bears," but, as you will see, were the wildest of the wild. We entered the park in two parties. One

consisted of Ned Frost, guide; a cook, a horse-wrangler, my brother, G. D. Pope, and his friend Judge Hulbert, of Detroit. The other consisted of Arthur Young and myself. Mr. Young and I were the ones concerned in the killing of the grizzlies.

Armed with bows five feet eight inches in length and pulling from seventy-five to eighty-five pounds, which we manufactured ourselves from California yew, and with arrows of white birch, twenty-eight inches long, with steel heads ground to razor sharpness, we spent nearly a month hunting through the mountains, finding plenty of grizzlies, but all were either old and scrawny or too young, too small, or with bad skins. We were seeking perfect specimens, not only for the killing of them, but because we wanted to try our primitive weapons on the largest of the American carnivorous animals, and because we wanted perfect specimens for the museum.

At length we came upon four grizzlies, an old female and three half-grown cubs, which we stalked all morning, until, as the warmth of the day increased, they sought a patch of snow in the shade of a forest and laid down in the cool white mass. We slipped down a little canyon,

crossed a stream, climbed a hill, and found ourselves—Frost, Young and I—creeping up on four healthy, wild grizzly bears in the open. Reaching the crest of the hill, we stuck three arrows each in the ground, nocked a fourth on our bowstrings—Frost having a rifle, which he was not to use except in emergency—and raised our heads to the thin tops of the brush. Not twenty-five yards away lay the four grizzlies flattened out, like so many hearth rugs, on the dazzling white snow.

I picked the farthest bear for my mark; Young chose his, and, at a signal from the eye, we drew our bows back to their heaviest pull, and loosed the steel-headed shafts. Both the slender missiles struck home. There was a roar as the four animals leaped to their feet, and, instead of charging us, rushed together in a battle such, I will guarantee, as few old hunters have seen, even in the times of abundance of grizzlies in the West. My bear, struck in the shoulder, threw himself on his mother, biting with savage fury, and she, in turn bit him on the shoulder, snapping short off the arrow, whose head was firmly anchored in the flesh. Both Young and I shot again, and again, my companion's arrow piercing the mother bear in the chest, while mine drove in beneath one of her forelegs.

As I drew a fourth arrow from the quiver, the old bear saw us. The hair rose on the back of her neck; she steadied herself, and, on the instant, charged. With three leaps she was ten feet from us. I drove another arrow into her chest, and Frost's rifle roared in my ear. She went over backward, rolled nearly fifty yards, regained her feet, attempted to charge again, and, as we

drove two more arrows into her, fell down dead. The cubs ran, and we walked down to the scene of the battle. Young had three arrows in the old bear, one deep in the neck, and protruding through the shoulder; one in the chest, and a third, which had passed completely through the thorax, lying on the ground, only the feathers remaining in the wound.

My first arrow cut in below her diaphragm, penetrating the stomach and liver. My second had passed completely through her abdomen and lay on the ground several yards beyond her body. Frost's shot had knocked down the bear and stopped her charge, but the wounds from our arrows were fatal without the aid of the rifle. A short distance away we found the wounded cub, stone dead.

But we wanted larger bears, particularly a full grown male and female of better size and pelage, with smaller cubs. We hunted until we believed that the grizzlies had had warning of our coming and left the park. Then, however, the elk began to pour back, in singles, in

couples and in herds, and with them came the grizzlies. We met one large grizzly on the trail, but with a snort of distrust, and possibly fear, he pulled up short in his tracks and left at express-train speed for other and safer sections of the park.

A month later, Young

and I moved up into the vicinity of Dunraven Pass and Tower Falls, and continued the hunt. Then, out of a clear sky, so to speak, we came upon the trail of a huge bear. We found, as we followed his careless trail, the place in which he had ambushed a herd of elk, and, leaping out, had slain a mother and her calf



Arthur Young, W. J. Compton and Dr. Saxton T. Pope (Left to Right), the Three Leading Exponents of Hunting with the Bow, and a Deer Killed by Them on a Recent Hunt

Makes Fortune Putting Swamp to Work

Woman Converts Marsh
into Profitable Water-Lily
Farm with Several Side
Lines

by MARY H. TALBOTT



Victoria Regia, the Largest Water Lily—the Leaves
Are 4½ Feet in Diameter

SWAMP land is always an eyesore. It should be put to work. How?

Mrs. L. Helen Fowler, who lives near Washington, D. C., planted hers in water lilies and now cuts many thousand blooms a day and sells them in all the large cities of the East. Some of them even travel as far as Chicago. She is conducting the largest water-lily farm in the country, if one may call a succession of ponds a farm. She has a market in which, so far, there is little competition. Many a pond or lagoon now looked upon as waste could be turned to profit in this way.

"Water lilies," Mrs. Fowler says, "are the easiest of all flowers to raise. Still water, rich soil and plenty of sunshine are the three important requisites. From a single pond planted with the commoner sort of lilies, which the first year yielded a profit of \$113.64, the farm has grown until now there are twenty-five ponds

representing more than twenty-five thousand dollars in plants and equipment—all from putting the swamp to work."

These ponds are scarcely more than eighteen inches deep in water. Growing in as orderly rows as a drill-planted corn-field are close to a hundred varieties of water lilies and several dozen kinds of lotus flowers. Not only the flowers but the roots and plants are shipped in great quantities for the stocking of lily ponds all over the United States and this energetic woman even sends shipments abroad. Water-lily culture is one of the newest interests of the gardener. A lily pond is a possibility for anyone who has even two square feet of water surface in a sunny spot. Ponds range from a half



Mrs. L. Helen Fowler Planted Her Swamp Land in Water Lilies and Now Is Conducting the Largest Farm
of the Kind in the Country

barrel or tub and small and large concrete ponds to lagoons along quiet streams where the water is not too deep.

We learn from Mrs. Fowler that there are two distinct kinds of water lilies, hardy and tender. The former are so vigorous they will take care of themselves in the struggle for existence and come up blooming and smiling from May to September every year. Being hardy, these can be transplanted successfully almost any time of the year. When the roots are set in the mud there is little else to be done except to gather the flowers. The tender lilies require a little more attention, but their beauty will repay one for the trouble as the most gorgeous colors are seen in the fragile kind. Of this latter variety there are two classes, those which bloom in the

daytime and the night bloomers. As a commercial proposition, however, the hardies and day bloomers are the best to raise.

There are several side-line possibilities in lily farming which this woman has developed. The trailing, feathery moss that is used in aquariums is grown in quantities and shipped by basketfuls every day, after it has been sorted, bunched and tied with strips of lead foil so that it holds its position in the aquarium. Sales of this moss amounted to about three thousand dollars last year. Not a bad side line! And there are others, such as goldfish and Copenhagen snails, both of which cost practically nothing to raise and are very profitable. The snails are used in aquariums. They aid in keeping them clean.

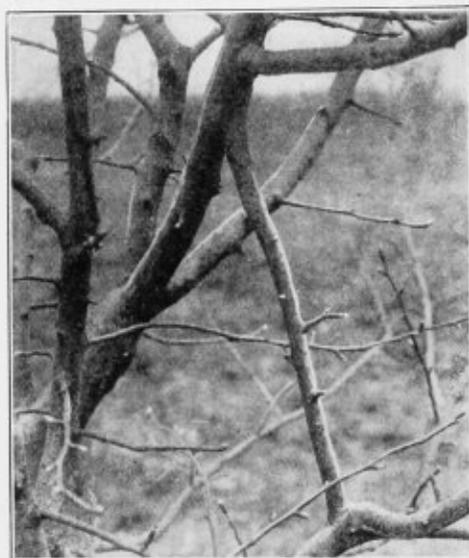
Novel Grafting Methods Protect Fruit Trees

IT is a hard job for the orchardist to fully protect trees against severe storms which may split branches or even completely upset trees. The selection of sheltered locations and the use of wind-breaks is resorted to but because of the fact that elevations are usually sought as orchard sites on account of the superior air drainage and freedom from frost it is found that orchards suffer greatly from summer wind storms.

From work done by investigators of the Ohio Agricultural College it has been found that there is still an opportunity after the formative period is past to remedy weakness of the form of the



A Brace Made by Intertwining Living Branches. These Branches Coalesced After Four Years Forming a Single Smooth Limb Having Two Places of Origin



An Unusual Form of Grafting—a Verticle Brace Supports a Lower Limb

tree due to imperfect pruning in order to give greater strength and stability for withstanding the bad effects of wind storms. In trees of ten years of age or less it is often possible to secure inner branches that may be intertwined in order to form a living splice. It is claimed that in this method the branches actually coalesce and unite.



HOW the EARTH IS KEPT in BALANCE

By Marinus Cook

THE earth is a ball, speeding through space and revolving around its axis in twenty-four hours, but its movements are so regular and its revolutions so nicely balanced that no one knows that he is moving around and around until he begins to apply science. This perpetual motion knows of no shocks nor halts nor of variations in speed. It is no wonder that the ancients used the earth as the very example of stability.

It seems most obvious that the earth's revolutions are so smooth and shockless from the fact that her form is a sphere, or nearly so, and therefore in perfect balance at all times. But a closer examination of this old earth of ours makes this nice balance less obvious. You can make a smooth, round apple revolve very easily around a piece of wire that you have run through its core, but it is impossible to do this with an apple from which you have taken several bites, because of the irregular shape. You know that this apple will jerk, halt and fall over; that it will revolve in a very irregular way.

Now, such is the shape of the earth—an apple from which several bites have been taken. It is only the water on the earth's surface that gives our earth its globelike form, in the same way that a certain quantity of water, falling down, assumes this same form.

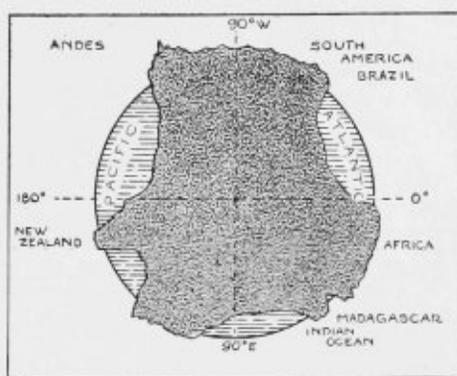
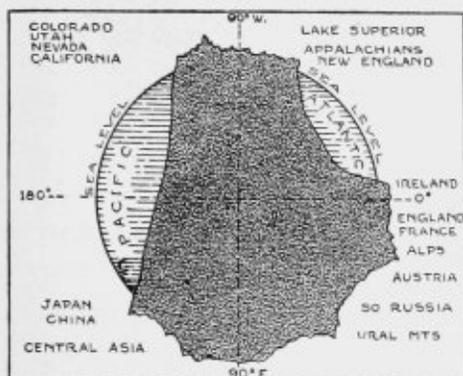
Everybody knows that a large percentage of the earth's surface consists of water—more than half of it. But when we consider the entire mass of the earth, we find that only 7 per cent of this volume is water and the rest, 93 per cent, solid substance. Of this solid substance about 95 per cent is igneous rock, hard

and solid and much heavier than water. Compared with this enormous mass of rock the quantity of water is negligible.

Therefore, eliminating this 7 per cent of water, which is the cause of the spherical form of the earth, we have a heavy body of rock, very irregular in shape.

If we were able to take a cross section of the earth along a belt running between latitude 40 degrees and 50 degrees north we would gain a very adequate impression of the irregular shape of the solid part of the earth. Beginning a journey around the earth at the Pacific Coast we would ascend gradually across California, reaching the highlands of Nevada and Utah, and climb the pinnacles of Colorado; then drop through Kansas to the level of Lake Superior, the Ozark mountains alone standing out as an elevation. (Remember we are traveling through a broad belt of ten degrees.) From this Lake Superior region we would rise through the Kentucky mountains to the Appalachians, then descend to New England and drop to about 13,000 feet below sea level to the floor of the Atlantic Ocean. Coming up on the other side in green Erin, we would cross England, the gentle slopes of France and Germany to rise suddenly to the summits of the Alps, 5,000 feet. From there we would go down through Austria and the plains of southern Russia, then climb the Ural mountains to the highland of central Asia, the "roof of the world," 13,000 feet high. Going farther east we would reach the plains and valleys of China, cross over to Japan and drop to the deep floor of the Pacific 16,000 feet below sea level.

A look at our first illustration will give an idea how extremely irregular the shape



Cross-section of Northern Hemisphere at Lat. 40°-50° N. (left), and Southern Hemisphere at Lat. 10°-20° S. (right) Illustrating How the Earth Is Made up of 93 Per Cent Solid Substance and 7 Per Cent Water. The Heights and Depths are Exaggerated on Account of the small scale.

of our earth is. It is a cross section of the northern hemisphere taken along the belt between latitude 40 degrees and 50 degrees, and seen by an imaginary person, standing exactly on the north pole, looking southward in every direction.

Our second illustration represents a cross section of the southern hemisphere taken along a belt running between latitude 10 degrees and 20 degrees south and seen by a person standing at the south pole, looking north in every direction.

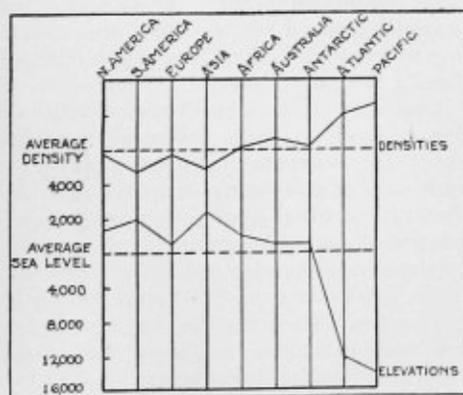
If from these cross sections you can imagine a body, you will find it of an exceedingly irregular shape, and you will also clearly understand that such a body provided with an axis running from pole to pole will not swing around its axis very smoothly and evenly, but will behave just like the apple from which you took several bites.

How, then, does the world keep balance if the form is so irregular?

Here is where the density of the rocks comes in. Some rocks are heavier than others, that is, their density is greater, and now it has been discovered that the density of the igneous rocks underlying the different regions mentioned in our journey are in reverse relation to their elevation. The more a region is elevated the less the density of its rocks, that is, the lighter its rocks are. And on the other hand we find the heaviest rocks in the lowest depressions.

Where the greatest bite has been taken out of the apple the substance weighs heaviest. Where there is an elevation is where we find the lightest material. What the earth in some places lacks in quantity is sufficiently made up in weight, and in this way the balance is nicely preserved. That we do not have to hold on to this irregular world of ours for dear life every time she spins around her axis is due to the fact that the rocks which form the ocean's floor are heavier than those on the mountain tops.

This condition is explained by the theory of isostasy, the theory of the stability of the earth's crust. According to this theory the interior of the earth is in a semiliquid condition, resembling syrup. Into this substance the heavier rocks naturally sink down and by their weight press the lighter rocks upward. Hence the occurrence of the heavier rocks in the depressions and the lighter rocks on the elevations. This accounts for the nice balance of our earth.



This Diagram Shows the Relation of Elevations and Densities of the Continents. Adapted From Henry S. Washington: "The Chemistry of the Earth's Crust"

DURING WHAT HOURS ARE YOU MOST EFFICIENT?

by MARVIN T. MOORE

THE millionaire business man glanced at his watch. It was just eleven forty-five in the forenoon. His right-hand man was in the midst of a conference with him. Upon the decision of the boss hinged a deal that involved a small fortune.

The millionaire held up his hand. "Get out and lock the door behind you. Come back at one-thirty."

It had happened before. Around the establishment over which the millionaire presides no one knew why and no one had the temerity to ask. Speculation as to the reason for that locked door ran all the way from a logical guess that the boss wanted to take a nap to the ridiculous one that he was the devotee of some religion that required him to pray from eleven forty-five to one thirty. But the fact remained that between those hours he was unapproachable. Incidentally, he ate no lunch.

The answer was perfectly simple. The millionaire for years had been interested in experiments in what are called the natural rhythms of efficiency. Among other things scientists had proved that the highest mental efficiency is reached between ten and eleven o'clock in the morning; that it drops again around noon and begins rising again so that it reaches the peak at two o'clock, after which it decreases until the end of the day.

It was typical of the millionaire that he preferred to decide things at a time when his brainpower was at its best. To prevent being tempted at other times he locked everybody out.

There is another man who appears at his office for only one hour during the day, between noon and one o'clock. He still insists upon dictating the policies of his firm, upon making the important decisions for it. Because this millionaire has not studied the hours of mental efficiency he has chosen the most dangerous of them all. His business, during the time he has been doing this, has lost

much of the virility and snap and go which made his money for him.

A certain prominent coach in college athletics once came close to upsetting friendly relations by his insistence that no baseball or football games in which his teams engaged should begin before three o'clock in the afternoon, and the later the better. It wasn't stubbornness. It was the knowledge, based on scientific data, that physical ability is at its highest between three and six in the afternoon. For the same reason he always tried to maneuver so that his weight throwers and jumpers should compete around eleven o'clock, the forenoon hour of highest physical efficiency, and his runners race in the late afternoon.

Of course the same thing was true of his opponents, but he didn't care for that. He wanted his men to make the best showing they could. If they were defeated it was because the other athletes were better.

Almost everyone has a preferred time for brain work and for exercise. J. Ogden Armour, the packer, arises around five o'clock and is at his desk two hours later. Usually he is in bed by nine. A certain successful writer never gets up until ten o'clock and his best work is done around midnight. He says that the years he worked as a reporter on a morning newspaper makes him more efficient during the night hours.

Opinions of this sort have been held for centuries, some favoring morning hours for concentration, some afternoon and still others being firmly convinced they can do good work only at night. Yet science is against most of them. Generally they have hypnotized themselves into their beliefs in spite of the facts.

It is interesting to note that few people are really at their best when they think they are. College students were asked by Professor Arthur Gates to tell at what hour they could study best. The majority said eight or nine o'clock. Few chose

the better hours of ten or eleven, and hardly any picked three in the afternoon, when both mind and body are at their best. Most of them pleaded fatigue at that hour, although it has been definitely shown that the greatest amount of work and often the best work can be done when all the indications are that fatigue is present.

In the Midst of an Important Conference, the Business Man Requested His Assistant to Leave, Lock the Door and Return in Two Hours



You have repeatedly seen a football player who apparently is done up or a boxer who seems on the verge of collapse suddenly display unexpected vigor and ability which the newspapers next day say was "born of desperation." As a matter of fact, it may have been simply efficiency reaching the peak in spite of bodily weariness.

Not only the time of day but the season of the year and the weather play their part. Haven't you heard it frequently remarked on a gloomy day that it was "typical suicide weather"? Yet it has been shown that more suicides occur on bright, sunny days. It may be that the resolution to end one's life is reached on a dismal day, but statistics in New York City over a five-year period reveal that the deed is committed on bright days.

Accuracy is more likely on a sunny day or on a day when cloudiness is accompanied by dryness. Damp days always bring warnings in banks and other finan-

cial houses for less speed and more care in dealing with complicated figures. One of the greatest banking firms in the world, the Bank of England, goes farther. On foggy, rainy, dismal days it locks up the set of books in which even a tiny error would produce disastrous results later on. Most of us have to do our work rain or shine and we can take advantage

of the fact that bad weather lowers accuracy only by making special efforts to be careful.

We Americans are prone to poke fun at the British habit of having a cup of tea at eleven in the morning and four in the afternoon. Yet there is a scientific argument in favor of it. The stimulation of the tea does much to overcome the tendency of the brain to slow down after those hours.

If we seem mentally fagged when we get home after a day's work we usually take a new lease on life after dinner. We enjoy reading, writing, card playing or other things that require mental effort. Why is it? Once again science can answer. Our minds are not taxed with the details of daily routine and the distractions are fewer. To a great extent these facts offset the drop in efficiency of the after-dark hours.

During what hours are *you* the most efficient?

A TWO-FOLD JOB for the MISSISSIPPI

Henry Ford to Develop Large Manufacturing Plant Near St. Paul, Using the Waters of the River Twice—to Help Make His Cars, and Again to Ship Them

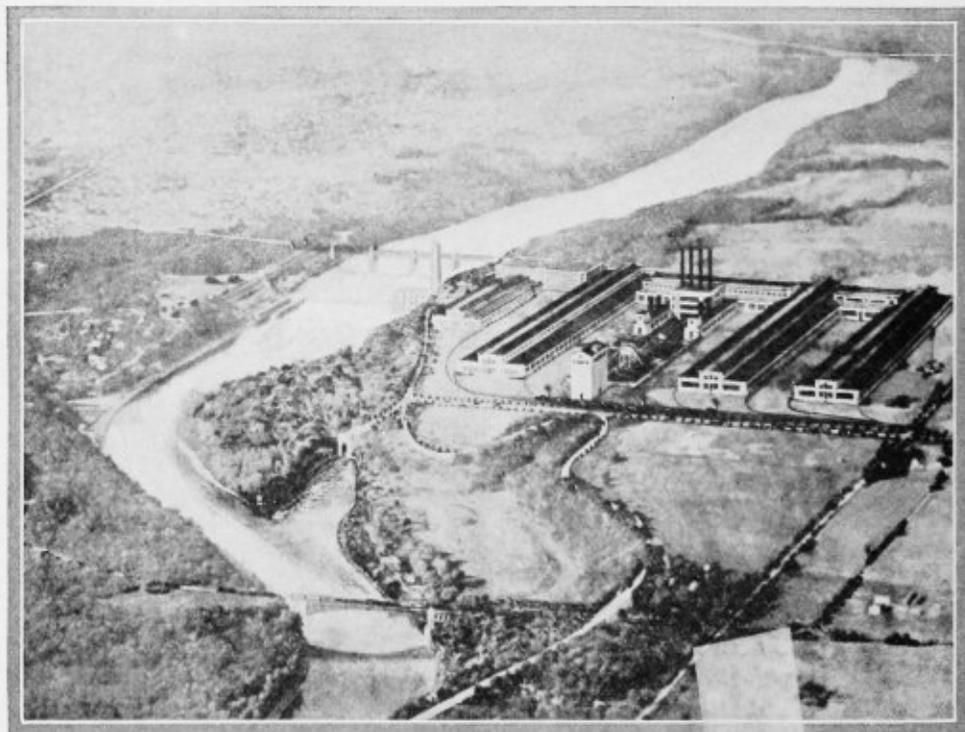
by EARL CHRISTMAS

IN accordance with plans to decentralize his great industry, Henry Ford is to develop an extensive manufacturing plant at St. Paul. The Detroit manufacturer has purchased one hundred and seventy acres of land on the banks of the Mississippi there, and construction of the first unit in the new plant will begin this spring. An expenditure of ten million dollars is contemplated according to announcement.

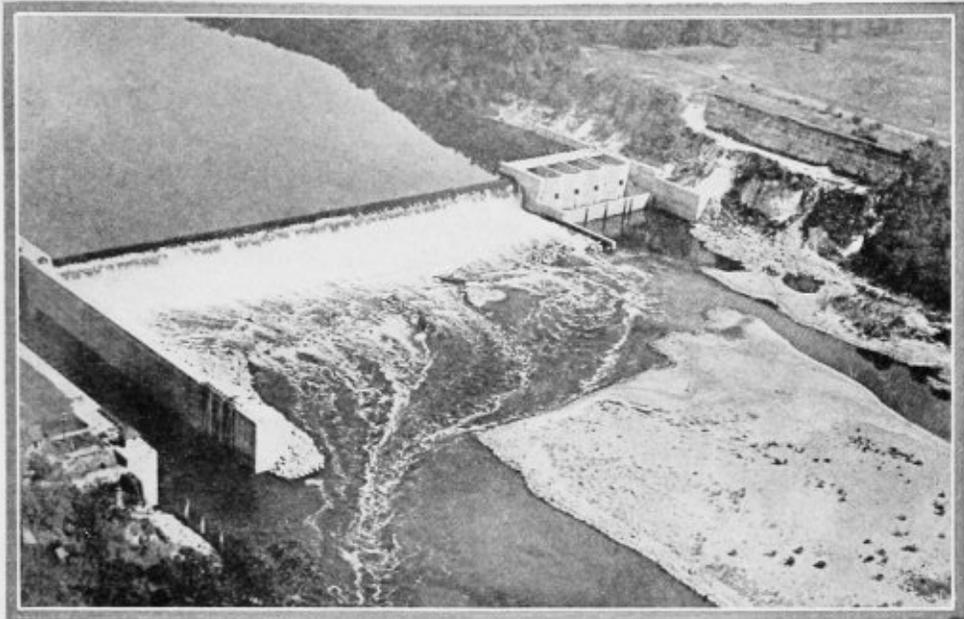
The project is coupled with plans for the development of water power at the government dam at St. Paul, known officially as Lock and Dam No. 1. Ford has been given a permit for this power and will use it in the big manufacturing plant to be built on the banks of the Mississippi.

Ford engineers now are preparing plans to be submitted to the Federal Power Commission for approval in accordance with the conditions of the award.

Several factors enter into the decision to establish the Ford plant at St. Paul. Henry Ford and his engineers believe that his organization in Detroit, where eighty thousand men are employed in his factories, is getting too big and unwieldy for the highest efficiency. Accordingly plans have been launched looking toward the decentralization of this huge industry. Besides the plant at St. Paul, manufacturing plants are to be established at New Orleans, near Chicago and on the East Coast, it is announced. St. Louis is another possibility. The plan, if



An Airplane View of the Site Selected for the New Ford Plant at St. Paul, with an Architect's Drawing of the Plant from Preliminary Plans Superimposed on the Photograph. The Plant Stands Directly on the Banks of the Mississippi, Which Ford Is to Use Extensively for Transportation, and is Adjacent to a Government Dam, from Which He Hopes to Develop Electric Power



Water Has Been Going Over This Dam in the Mississippi Near St. Paul, for Five Years, Its Power Being Wasted. Now Henry Ford Will Utilize It in Making Autos and Tractors. Having Been Given a Permit for the Power, He Plans to Use the Waters of the Mississippi Twice—to Help Make His Cars, and Again to Ship Them

carried out in full, will represent one of the biggest movements in the history of industry.

The new Ford plan is to produce directly at the great natural trade gateways so far as possible. The plant at St. Paul is to serve a large group of states in the Northwest and Middle West.

Establishment of the plant at St. Paul will bring back river traffic on the upper river for the first time in recent years. In fact, this possibility was one of the reasons for the selection of the site. Ford plans to use the Mississippi river extensively for the transportation of his raw and manufactured products.

Coal, timber and other products will be brought up the river in Ford barges, and the barges will return with cargoes of motor cars and tractors for the rich farming country down the Mississippi Valley. This will give him a big saving in freight rates to many points.

The plant at St. Paul is to stand directly on the banks of the Mississippi. A river terminal is to be built at the water level. Materials will be raised directly to the plant on the bluff, eighty feet above, through tunnels in the soft sand-

stone, and finished products will be brought down through other tunnels.

When completed, the plant at St. Paul will furnish employment for fifteen thousand men. In connection with the plant, there will be established a hydroelectric laboratory for the University of Minnesota.

Lock and Dam No. 1, completed in 1917, cost the government about two million dollars. Though the dam improved navigation facilities and extended the head of navigation from St. Paul to Minneapolis, there has been little or no river traffic. Moreover, the water power from the dam has been going to waste all these five years. Engineers estimate it will produce from ten to fifteen thousand horsepower. This is said to be the biggest water-power project on the Ford program with the exception of Muscle Shoals.

The power at the dam has been much sought after, both the city of Minneapolis and a private power company having tried to procure the permit to utilize it, but the industrial promise in Ford's plan turned the tide in favor of the Detroit manufacturer.

IS THE FEMALE OF THE SPECIES

Not Among Captive Wild Animals

FROM the jungle books of childhood, from memoirs of big game hunters and explorers and from works of wide range pertaining to natural history you and I have had the fact generously impressed upon our minds that the female creature of the wild, by the side of wounded mate or litter of young, is an animal that will not listen to reason. The lads who wear the sun helmets on the veldt or in the jungle sprinkle the reports of their expeditions with passages something like this, "My first shot caught the magnificent male (the largest and most perfect specimen of black-maned lion I had seen on the entire march) squarely between the eyes. Gongo, the chief spear bearer, ran forward to investigate and add, if necessary, the finishing coup, when a lioness (as large and as perfect a

creature as her mate) sprang from the tall grass upon the boy's back. I fired again. The lioness somersaulted backward, carrying Gongo with her, and lay still, but my faithful boy was beyond aid."

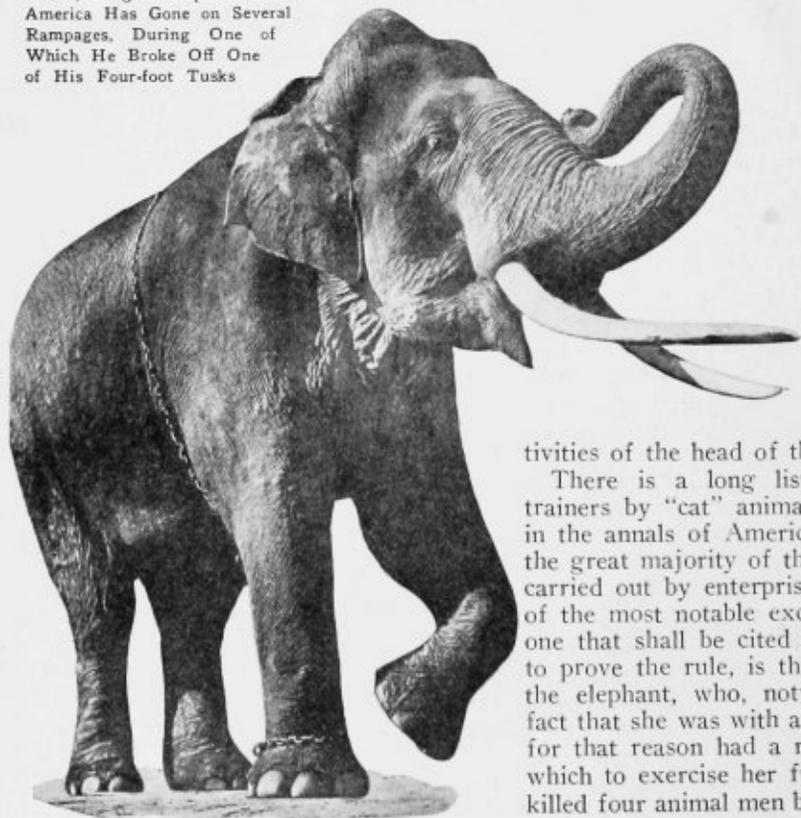
Little incidents of the trail so recorded naturally lead you and me to believe that the female of the species is more deadly than the male, and we leave it at that, for the desire to prove this to our own satisfaction is not within us. However, there must be a reversal of form when a jungle-bred animal is forced to seek a career in captivity and in the exhibition arena, for, almost without exception, it is the male that holds to the ancient law, "An eye for an eye, a tooth for a tooth"—only the captive male believes in taking his first. It is the male, be it tiger, lion, leopard or

elephant, that attempts to shatter man's mastery with slashing claw, swinging trunk or crunching jaw, while the female looks on with more or less ennui, lending a hand now and then by way of showing wifely interest in the ac-

tivities of the head of the house.

There is a long list of attacks on trainers by "cat" animals and elephants in the annals of American circuses, and the great majority of these attacks were carried out by enterprising males. One of the most notable exceptions, and the one that shall be cited as the exception to prove the rule, is that of Big Mary, the elephant, who, notwithstanding the fact that she was with a small show and, for that reason had a restricted field in which to exercise her fun-loving nature, killed four animal men before it occurred

Tusko, Largest Elephant Ever Seen in America Has Gone on Several Rampages, During One of Which He Broke Off One of His Four-foot Tusks



MORE DEADLY THAN THE MALE?

According to Circus Records

Braden to the management to do something earnest about it. The story of her fate is one of the most unusual in circus annals.

Seven years ago Big Mary climaxed her hoydenish, but fatal, exploits in a small Tennessee town, and two marble shafts—one in the cemetery and one near the city dumping grounds—now serve to remind the residents of the incident. The first shaft was erected in memory of an animal man of little experience who, after caring for Big Mary two days and realizing that he was still alive, conceived the idea of playing Simon Legree. The other shaft marks the resting place of Big Mary, who, with three notches on her trunk, had come to the conclusion that an animal man more or less was a matter of little or no moment. Both Big Mary and the amateur animal man had little time in this world to ponder their mistakes. It cannot be said that they lived to regret them.

It was the third day of the animal man's association with Big Mary, and familiarity, combined with the elephant's apparent docility, had certainly bred in him a fine, expansive contempt. The town was Erwin, which lies in the Tennessee hills, and the mountaineers visiting the show were easily impressed. The men handling the elephants were admired that day, and that admiration was expressed by the spoken word. "Well, I declare, don't they jes' make them big critters step aroun'!" was the type of remark that reached the new animal man's ears.

It was too much for the amateur and, to show his complete mastery of Mary, he began to abuse her with elephant hook and stake. The big creature stood it until, with the menagerie well filled with wide-eyed hill folks just before the afternoon performance, the novice, against the protests of the other "bull" men, began to act the part of Simon Legree. In other words, he

hooked Mary this way, and he hooked her that way, and for no cause at all. But he hooked Big Mary once too often and, amid the screams and groans of the crowd, the big elephant's trunk whipped about the new man's waist, slapping him to the ground. Then, before an attendant could move, Big Mary kneeled on the man's trunk and head, crushing him to death instantly. Unperturbed, she arose to resume the eating of choice cullings of hay from the pile at her feet.

Of course, there was great excitement among the show people, but there was more among the townsfolk. Here was a Tennessee mountain town that was not accustomed to killings—by an elephant. The city officials and those of the county were inclined to see in Big Mary's retaliation an affront to the dignity of the community. These gentlemen held council and the results were unique, unexpected and wholly surprising. They decided to

Loto, a Huge Male Hippopotamus, Closed His Jaws on a Trainer's Leg in a Rage

PHOTO HARRY A. STINELL STUDIO



issue a warrant for Big Mary charging her with murder, and they did. They then proceeded to try her before a jury of twelve good men and true, and a verdict of murder in the first degree was brought in by that body within five minutes. The court immediately passed sentence—that the elephant should be hanged by the neck until dead.

They do things fast in Erwin. They specialize in action. Big Mary's gallows were ready almost as the court voiced her doom. The railroad's division wrecking special stood on the siding in the heart of the little city, with in one hundred yards of the elephant car in which Mary had ridden to town that morning so happily and contentedly. On the special was a heavy steel crane, equipped with stout chains, wrought for the lifting of derailed and overturned cars. That was the little apparatus the Erwinites had in mind for the hanging of the condemned elephant.

The circus management was consulted now for the first time; that is, a squad of deputies appeared to order Big Mary's death march to the gallows, and to accompany the trainer detailed to lead her. Mary, lumbering along with no idea of the shock awaiting her, perhaps a trifle exultant that she had earned a fourth notch on her trunk that day, made the distance from the lot to the side of the gallows car in no time. Five thousand people were gathered for the biggest public hanging in the history of the county. Chains were passed around the huge elephant's neck and hooked under her ear. All was ready. A donkey engine began to cough, and Mary's front feet left the ground. She started to struggle,

but soon her hind feet were pulled clear, and she could only revolve as she slowly choked to death. She was pronounced dead in one hour and twenty minutes.

With Big Mary's strange case as the exception to prove the rule that it is the male animal in captivity which resorts to violence, let us consider the revolt of Loto, the hippopotamus, the only "blood-sweating behemoth" ever known to attack an attendant with aroused ferocity. One of the best known of animal men had conceived the idea of teaching Loto, a

massively built male, to draw a cart in the opening spectacle of the circus. The trainer was making some progress, although Loto had shown traces of temper on several occasions. One day, when the hour for Loto's lesson had arrived, the trainer's assistant entered the big enclosure surrounding the hippo's tank with Loto's head har-

ness slung from his shoulder. He called to the ungainly creature, which lay in the water with only his mighty snout and pop eyes above the surface.

For the first and only time in his life, Loto came out of the bath at full speed, and he came out with great jaws wide open. Before the astonished assistant could realize Loto meant to harm him, the hippo had closed his jaws on the man's thigh. The man's cries brought the trainer at the run. The latter seized a heavy iron bar, and struck the beast a terrific blow below the eyes. The hippo grunted, but held to his cruel grip. Again the man struck. Another trainer grabbed a bucket of carrots and held it before Loto's eyes. The assistant had fainted, when the first blow with the bar had landed, for it had



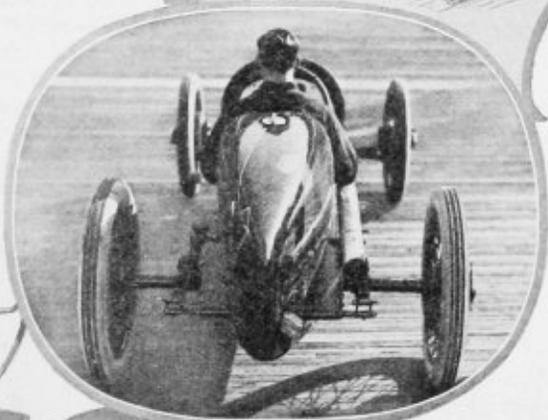
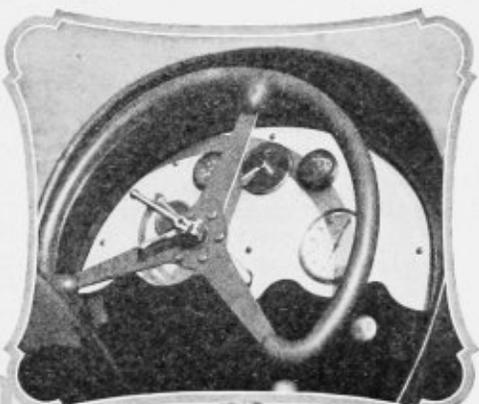
The Gentle-Eyed Ship of the Desert Rarely Attacks a Human Being, But in Two Cases Male Camels Have Been Guilty, Resulting in the Deaths of the Victims as the Camel's Bite Is Poisonous

SPEEDY "ONE MAN" RACING CAR

by PAUL E. GEORGE

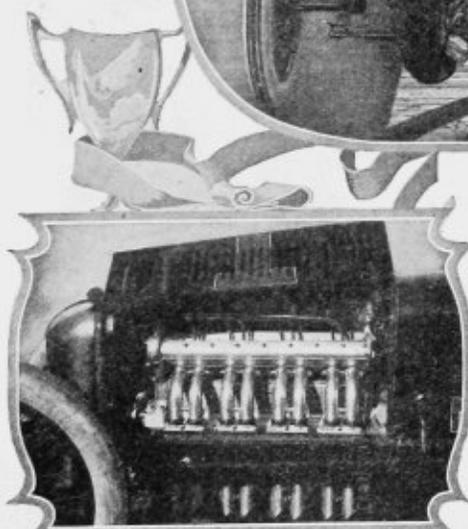
HARRY A. Miller, famous Los Angeles automotive engineer, has turned out his first "one man" racing car. The new job belongs to Tommy Milton and will be driven by that veteran in all races following the two hundred and fifty mile event at Fresno, California, on April twenty-ninth, which will see the two men, one hundred and eighty-three cubic inch cars in action for the last time.

With a staff of expert mechanics on hand, Miller has been working night and day on the new cars. With the Milton machine taken care of, Miller is now busy assembling and designing the mounts for the Durant team com-



Rear view from Above, Showing Lithe Assembly of the Speed Maker

Above—What the Racing Driver Will See Before Him When He Hurls the Car Under Full Power Over the Speedways



Carburetor Side of the Engine. Note the Smoothness and Precision of the Motor Parts

posed of Jimmy Murphy the champion, Cliff Durant, Eddie Hearne, Earl Cooper and Art Klein.

This one hundred and twenty-two cubic inch displacement car is a history maker, say those who have been permitted to view Milton's mount. It is approximately four hundred pounds lighter than any of the present American cars and looks like a miniature machine when compared to the old models.

With the going out of the two men cars and the doing away with the mechanics, the latter will undoubtedly turn their hands to driving and add new names to the lists of world famous racing car pilots.

CANADA BECKONS WITH GOOD ROADS

by EDWARD JEROME DIES

HIGHWAYS are being flung across Canada. Vast agricultural tracts that sprawl out from Winnipeg to the Rockies are becoming a network of roads that stretch like thin white ribbons to the horizon.

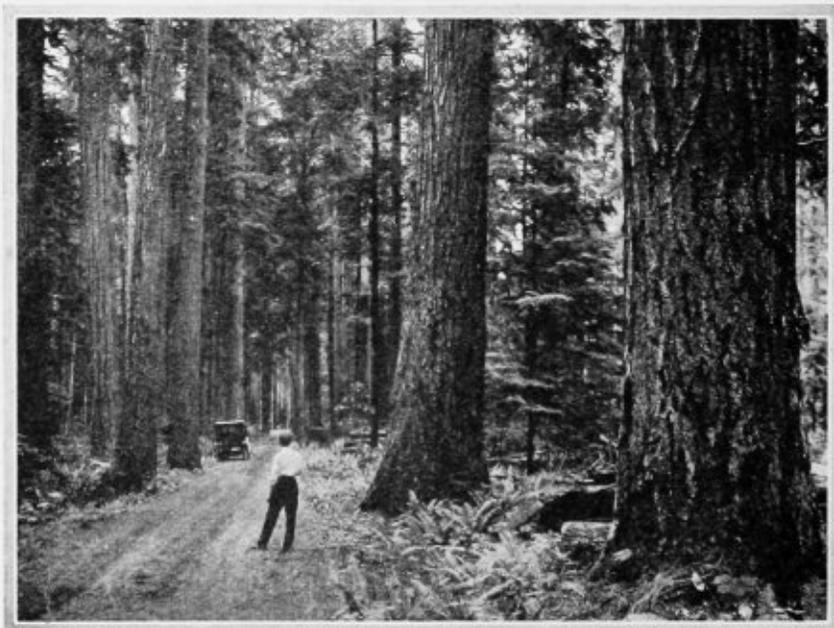
Twisting trails once black with the buffalo are being transformed into channels of commerce. Where the dog trains of the trapper and the poky prairie schooner of the pioneer once formed the background of adventure, there are today batteries of chugging motor trucks moving grain, fruit and live stock to market. Thousands of sputtering flivvers dance over the incomplete network of roads that will soon link this western empire into a solid unit of commerce.

Canada believes that good roads are a first essential of rapid agricultural and industrial expansion. The Canadian Government, accordingly, has appropriated twenty million dollars to be used in construction of main highways and market

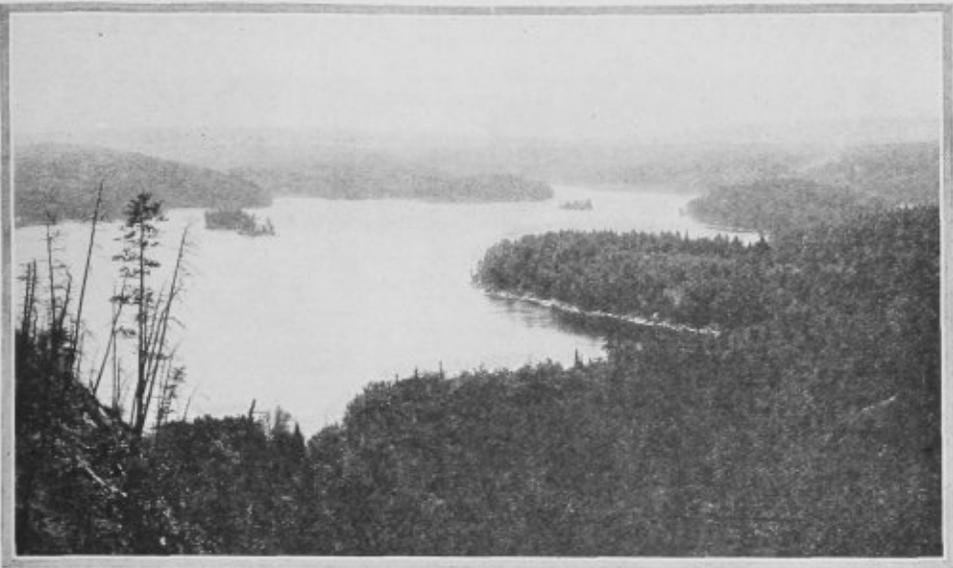
roads. It is to cover operations for five years. Under the terms provinces initiate and carry out the road building and the Dominion Government, on approval of the plans, contributes 40 per cent of the cost. This guarantees standardization of roadways, and places only 60 per cent of the expense on the province. Results are most gratifying.

The general campaign includes international automobile roads which will cement even more closely the trade relations between the United States and Canada. A highway from Ottawa to Sarnia, across the river to Port Huron, where the Victory Highway cuts across Michigan, is being laid out by the Ontario Highway Association. This links up with the Lincoln Highway which crosses the Jefferson Highway near Ames, Iowa. The Jefferson Highway runs from New Orleans to Winnipeg, "the trail from the Pines to the Palms."

From Winnipeg a boulevard highway



Evergreen Highway, Carved Through the Forest Giants of Vancouver Island. Roads Like This Tempt the Traveler to Explore the Vast Area and Beauties of the Canadian Country



Scenery Fringing an Algonquin Park Motor Lane

is to stretch to points in North Dakota and Minnesota and across the Mississippi Valley. Another international road will connect Alberta and Montana.

Caravans of motorists are drawn north and west by the new highways. Motor tourists now follow "Lovers' Lane" from Edmonton, Alberta, up to Jasper Park on the Grand Trunk Pacific Railway in the Canadian Rockies, a picturesque playground with churning waterfalls, tiny sparkling lakes and snowcapped mountains. New trails wind to the foot of Mount Edith Cavell, Mount Robson, Old Man Mountain and the hundred other

inches are running their good roads campaign well. Every farmer in the rich, mixed farming districts tapped by the Canadian National Railways, the Government-owned lines, is an enthusiastic good roads advocate. The reason is obvious. Production is rapidly increasing. Each year new high records are established. If the farmer can move his produce to market quickly, economically and conveniently, a tremendous problem is solved. And that is what is being made possible for the western Canadian farmer. His marketing cost is being slashed to a minimum through Canada's good roads program.

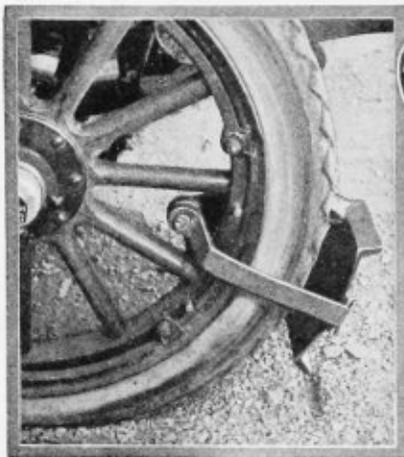
The plan of the prairie provinces is to establish main arteries of travel with a network of connecting roads. These roads will join all the cities and towns of the province and will connect with the main highways of adjoining provinces.

Today Canada is the largest buyer of American-made cars. In late years it has purchased about a fourth of the cars exported by the United States. One of every fifteen residents of Western Canada owns a motor car. In the entire country one in every twenty-three persons is an automobile owner.

The effect of the highways movement may be seen in the automobile figures of Western Canada. The aggregate value of cars in these provinces is \$300,000,000.

But from an economic standpoint the most important results are being obtained in the prairie provinces, which are being rapidly settled by farmers. These prov-

NEW AUTOMOBILE ACCESSORIES



When used as a jack this appliance is fitted into two holes in the wheel felly and car reversed to lift wheel. It is also a car lock



Signal is operated by driver pressing button. Human hand is illuminated on oval as it moves on rear of car

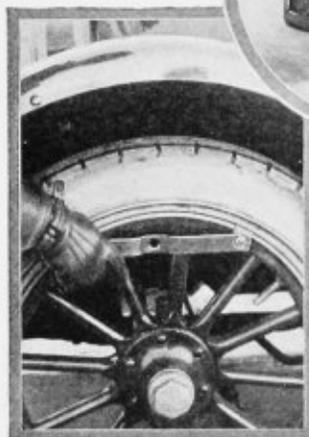


Rubber device stretched around the steering wheel resembles a small automobile tire. Its raised design is vulcanized in and prevents the hands from slipping. It is soft and yielding to the touch



Center—This inner control spot light is unusually well constructed. It operates by means of a lever from the inside of the car. It is sold in nickel or silver finish and throws a powerful beam of light

Below—Handy all-around garage tool is combined tire tool and rim wrench. It has two sizes of holes for rim bolts. One end is for removing tires



Direction indicator, or compass, fastens on the dash of your car. It tells at a glance in what direction the car is traveling

Leather heel protector snaps around the heel only, giving free ankle play. It avoids the scratching or marring of milady's shoe



SILENCING SOME NOISY PLACES

All Through the Winter Months You Have Probably Been Satisfied to Supply the Car with Oil, Gas and Water, Being Thankful if It Carried You to Your Destination Without Trouble. It Was No Pleasant Sensation to "Fix Her Up" on a Zero Morning and Most of the Little Troubles Were Neglected Until the Weather Became More Pleasant

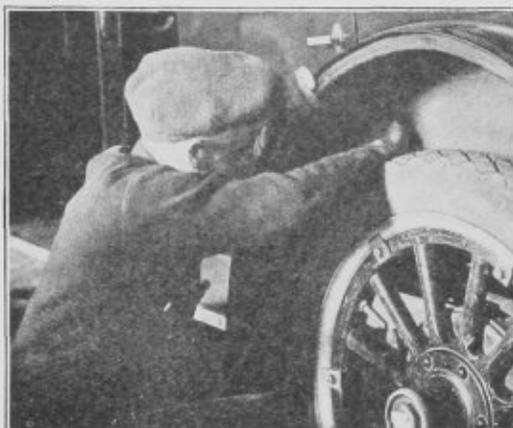
by LOWELL R. BUTCHER

IT is easy to stop some of the annoying rattles and squeaks which have irritated you all winter. The longer they are neglected, the harder they will be to silence. One of the first rattles which becomes noticeable is likely to be caused by the fenders of the car. A fender sticks out in a rather unsupported position, is

subject to loads of mud and is not infrequently pounded by loosely adjusted chains. It soon begins to protest audibly.

Noises from this source are most often caused by loose fender bolts or from the fender rubbing against the body of the car. Loose bolts cannot always be tightened; sometimes they are rusted and worn so that a soaking with kerosene will not loosen them, they should be clipped off and replaced with new bolts. It may be necessary to place a washer at each end of the bolt if the holes are much worn. A small washer cut from a piece of felt or from an old inner tube and placed between the fender and the body will do much toward stopping the noise. If the fender has been rubbing against the body, giving out an irritating squeak, the noise can be remedied by spraying a little oil between the two surfaces.

Sometimes the flange of the fender is broken or damaged resulting in a hinge



"A Stitch in Time" Will Give You Peace of Mind from All the Aggravating Noises That Have Sprung Up During the Winter Mileage

action at the point of breakage. About the only effective cure is patching. This can be done without marring the appearance of the fender by having the reinforcing strip placed on the inside of the fender so only the heads of the rivets will show. The crack on the outside can be cleaned, soldered and painted over.

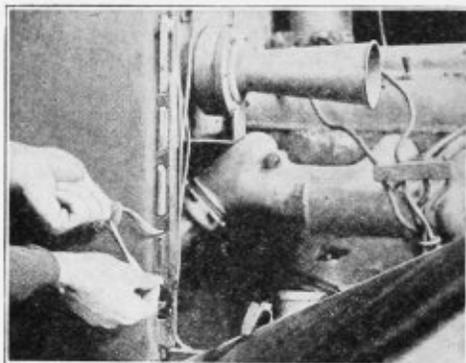
Brake rods are the source of some very elusive rattles, usually caused by worn pins or by vibration of unsupported rods. Worn pins are easily replaced but the drumming noise caused by vibrating rods is more difficult to locate and silence. As the brake rods are often in pairs, vibration may be somewhat checked by connecting the two rods with a spring of slight tension. Should the car be of the type which uses a transmission brake and only one rod at each side of the car, the spring may extend from the frame to the rod.

A great deal of the noise at the front end of the car comes from the steering gear and drag link. The steering ball and the ball on the radius rod often wear their sockets so that considerable noise is created. This may be cured by filing down the cap of the socket much after the fashion that the bearing caps of the car are filed. This will allow the cap to be tightened down on the ball, giving a better fit.

Worn bushings in the end of the tie

rod will cause noise. If badly worn they should be replaced. The steering pivot, or king pin, bushing may also need replacement.

At this time of the year the wheels of your car are probably in fair condition and do not give off any squeaky sounds. Later in the season the spokes of wood wheels may shrink, giving a monotonous squeak often heard in dry midsummer. It is poor policy to stop the squeaks by soaking the wheel hubs in water. The cure will be temporary and soon the noise will be worse than ever. Most of the noise is caused by the spokes shrink-



The Lacing on Which the Hood Rests May Need Replacing. The Use of Rawhide Is Recommended

ing at the hub and cracks appearing between them. A tiny wedge of sheet metal is the most effective repair. It should be ground to a taper at one end and have the barb which prevents it from working out when once driven home between the spokes.

The detachable rims of the wheels may give out a squeak very similar to the one produced by loose spokes. The remedy is to tighten the rim bolts evenly. Sometimes a little adjustment of the rim nuts will be needed to straighten the rim on the wheel.

The springs of the car should receive their share of attention for there is nothing which contributes to the silence of the car so much as correctly lubricated spring leaves. Jack up the car, spread the leaves and squirt or spray a mixture of kerosene and oil between them. Look over the springs and assure yourself that the clips are tight and that none of the bolts are loose.

The shackle bolts of the springs

usually work on bushings. If these are worn, they should be replaced or they will be the source of clatter every time the car hits a bump. Some cars have bushings at these places which are adjustable for slight wear. If your car is so equipped, the job is much simpler. Springs of a car require very little attention when compared to some other parts, but if they are neglected they will give out a variety of noises. Spring covers are a mighty good thing and reduce the amount of attention necessary.

Look over the floor boards of the car. If these are held down by screws, be sure that the screws are tight. Some mechanics and owners have a habit of forgetting to replace these screws when the boards are taken up for any reason. While you are attending to the floor boards, it might be well to make certain that the battery isn't sliding about in its carrier. This may be a source of noise.

The doors of the car will require new rubber buffers after the car has seen several years' service. If new buffers are not supplied, the door will give the door post a sharp blow every time the car passes over a rough place in the road. New buffers are easily and cheaply installed. Tighten up the hinge screws of the door. A little attention here may make the door fit much better. If the screw holes are worn and the screws refuse to take hold, fill the holes with tightly fitting wooden plugs before replacing the screws.

Closed cars are subject to some rattles not found on the open car. The windows of the closed cars must fit tightly in their guides if there is to be no rattle. The windows usually work in metal guides which are lined with felt strips. If the felt becomes worn from continued use, a rattle is apt to appear. The old strips should be soaked off with alcohol and new ones applied, using shellac to stick them in place. Many devices for stopping the rattle of closed car windows are on the market but these will not be needed if the guides are properly lined.

The lacing on the hood support should be renewed from time to time. The renewal is inexpensive and will stop many of the hood noises. Rawhide lace is better than the fabric variety although a little more expensive. Put a little light oil

on the hood latches; they may give out disturbing squeaks if you do not.

While you are in the mood, make a crawling inspection of the under parts of the chassis. The body bolts should, of course, be tight but this will not always stop the body noises. Sometimes it will be necessary to place felt strips between the body and the rails. While you are underneath, look for unsupported tubing. Gasoline and oil lines should be supported at frequent intervals. Aside from the noise factor, there is always the danger of unsupported tubing giving away.

How about the license number? Are the bolts tight, or do they rattle? If you put a strip of old inner tubing between the back of the number and the bracket and draw up the bolts tightly, you will need to give that point no further attention until you are ready to remove the tag next year.

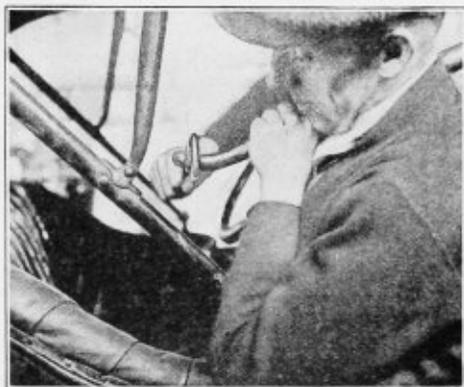
There are various points about the top of the open car which become noisy. A bow carrier often rattles around in its socket and the noise may seem rather difficult to stop. However, if the carrier is grasped with a large wrench and twisted slightly, it will probably bind in its socket and cure the objectionable noise.

While your mind is bent on stopping the noises of your car, don't forget the tools. Doubtless they are piled helter-skelter in the door pocket or under the seat and of course they make a noise. A neat tool roll is a good investment. Jack, pump and larger tools should be wrapped separately.

If you do not wish to go to the expense of buying a tool roll, take a long piece of burlap and wrap the tools in that. Be sure the tools are distributed so that there is at least one thickness of the cloth between them. Then put a trunk strap around the whole and you have a noiseless set of tools.

On one occasion, the writer was called on to trace down an annoying noise which seemed to come from the front end of the car. The dull thud

was apparent whenever the car encountered some rough going. Investigation disclosed the fact that the radiator

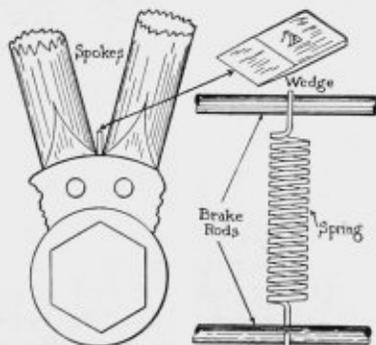


Bows of Tops May Be Prevented from Rattling by Twisting Them into a Position So They Will Be Quiet

brace which extended to the dash had some play and that any bump caused the radiator to move a little. This forced the rear edge of the hood back against the ridge on the cowl, causing the pounding sound. If you have trouble with some such elusive noise at the front end of the car, try lengthening or shortening the radiator brace. Your trouble may lie at the same point.

Door hinges need oil, but the problem is to supply it without putting on such quantities that dirt will gather and soil the clothes of the passengers. Ordinary engine oil runs too freely to make a satisfactory lubricant. Mix a small quantity of linseed oil with some finely-powdered graphite and use this as a lubricant for door hinges. Use but a very little in oiling the hinge. Linseed oil has small value as a lubricant but it carries the graphite lubricant to the inner parts of the hinge and will not run and spread as ordinary oil does.

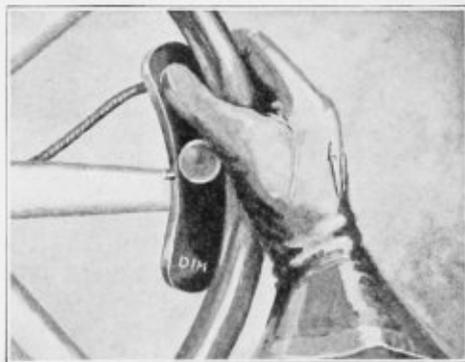
Much of the comfort and pleasure of driving comes from a smoothly-operating car and the car cannot be said to be smooth in operation if every bump or stretch of choppy road brings wails of protest from various parts of the car.



ALONG AUTOMOBILE ROW



THIS device fastened to the spokes of the steering wheel spider brings it close to the rim and within reach of the hand. The control of the headlamps, either bright or dim, and of the horn is brought within range of the thumb without changing the hand on the steering wheel. The device operates by a simple rocker motion and has a neutral position for putting lights out. The horn button is in the center and is operative at all positions. This attachment is likely to find favor with many motorists.



A NEW system of road signs and danger signals is in use on the state highways in North Carolina. The signboards are painted white. The lettering on the sign consists of a monogram of the state and the number of the route, both being enclosed in a black diamond.

Dangerous curves are indicated by signboards mounted in a similar way with "Danger" in red letters. Below is "Curve Right" or "Curve Left" according to the turn of the road. An arrow indicates the direction. The signs are set at a slight angle so as to face the driver directly and to make reading easy.



HERE is a new universal rim bolt wrench that is instantly transformed from one wrench into four accessible sockets. These sockets fit any standard rim bolt made.

A slight pressure under the sockets releases the locking device, permitting the turning of the spider to the required socket. The spider is automatically locked—the harder the resistance the harder it holds. With its 18-inch length and roll-handle grip, it gives ample lever-

age for an ordinary rim bolt job. In stubborn cases the leverage can be increased 300 per cent by turning the wrench handle at a right angle to the socket in use.

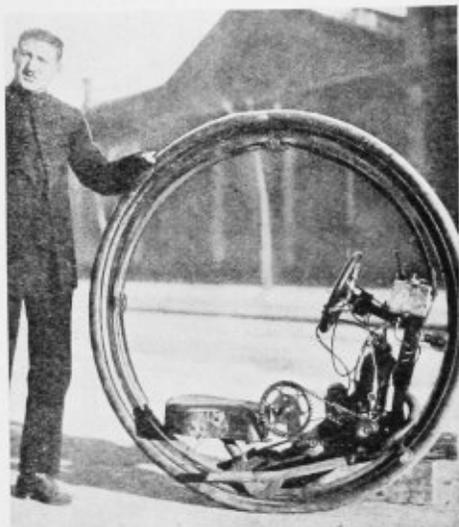


CAPABLE of making about 40 miles per hour, a unique motorcycle has its seat and engine built on a wheel which rolls around inside a large wheel on a principle similar to a railway engine on an endless track. The motorcycle is driven by a single-cylinder, air-cooled engine equipped with a magneto. It promises new thrills in the way of sport.

AS a result of 87-cent (and similar) bargain sales, almost every motorist in the country has a stoplight. But many of them are learning, to their sorrow, that the cheap switches supplied with these bargain signals are of very poor design and quality and often refuse to work. The reason is that when making contact many of them carry the current through the steel spring which works them and the heat generated soon de-temper the spring, causing it to break.

A switch which will cause no trouble for years can be easily made from a regulation single pole knife switch and two small springs.

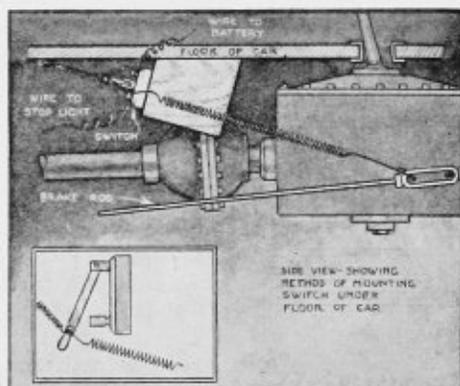
The switch, which may be of small



size if of sturdy design, should first be mounted on a wooden block so that it can later be fastened to the floor boards of the car. Just how the switch and block should be fastened to the under surface of the car depends entirely on the brake mechanism of your own car and can be easily determined.

One of the springs used can be a regular screen-door spring. The other should be weaker and only about one-fourth as long. The larger spring is connected between the switch handle and the brake rod; the smaller spring goes in the opposite direction from the switch handle and is used to keep the switch open when not needed.

Some adjustment of both springs will be needed to make the switch function properly, but once adjusted there will be no trouble.





The Average Automobile Owner Becomes a Better and Better Mechanic While Doing His Own Work

CARBON is the periodical bane of the motorist. Its accumulation is almost certain and its removal is imperative if the engine is to run at its maximum efficiency. Until gasoline is rendered far more volatile than it is and lubricating oil lubricates more efficiently, carbon is bound to form and accumulate in certain portions of the engine—principally the cylinder, the piston heads and valves.

Its presence is invariably made manifest by knocking or clinking when the engine is running under a load, and it may be a factor in overheating. These conditions may result from other causes, so make sure that carbon is the cause of your trouble before proceeding further. This can usually be ascertained by inspection through the spark-plug openings by means of a flashlight or a scraper.

Carbon is generally removed by scraping. Oxygen decarbonizing is also employed in some cases, but the removable cylinder heads are now so generally used in engine construction that its use is fast dying out.

Where the cylinder heads are cast integral with the cylinder and oxygen de-

REMOVING CARBON FROM THE MOTOR

by L. B. ROBBINS

carbonizing cannot be utilized in the cleaning process, one can make use of specially designed scrapers as shown in the accompanying sketches. These are merely long, slender steel tools with square, sharpened ends for scraping. The shanks of the tools are bent at various angles to allow the end to come in contact with every part of the cylinder. The tool is inserted through the spark-plug openings and the valve ports and the carbon scraped out by the sense of feeling. Of course the work is far from satisfactory except in the hands of a careful man who gains a sense of "feel" through experience. It will remove the bulk of the carbon and certainly improve the tone of the engine.

With the removable head the carbon cleaning process has been happily simplified. By removing several bolts the cylinder head comes off in one piece and the piston heads and valves are left nakedly exposed with their deposits of carbon. This can be removed by the simple process of scraping with a putty knife, a wide screw-driver blade or even a dull knife. The principal points of carbonization will be found to be the center of the piston head, the tops of the valves, around the valve seats and under the side of the cylinder head.

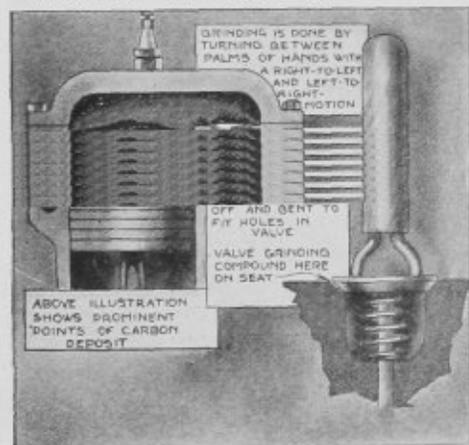
In a general carbon-cleaning job, remove the cylinder head and lay to one side. Then gently remove the gasket so as not to injure it and hang it up where it will not become bent and thus ruined. With a valve lifter remove the valves and place the springs and various parts in a box so they will not become lost.

Scrape away the carbon from each piston head, stuffing rags in the open valve ports and cylinders to prevent as much carbon as possible from dropping

into them. As fast as a bunch of carbon accumulates under your scraper, blow or wipe it away. Clean off the entire cylinder block until no carbon is left and then scrape the valves. Clean above and below but do not touch the valve where it fits in the valve seat. Scrape the valve stems, if carbonized, and, if necessary, clean out the guides. Then clean out the cylinder head. To clean the flat parts use a flat scraper—say a putty knife—and for the rounded parts of the head use a dull-edged $\frac{3}{4}$ -inch carpenter's gouge.

To insure maximum compression and to prevent quick recarbonizing, the valves should be ground in after the motor has been cleaned. This is accomplished by smearing the valve seat with a good grade of valve grinding compound, dropping the valve in place and turning it from right to left with a suitable tool. A light spring under the valve will assist in raising it for turning to a new position. Grind until the entire seat and valve edge present a clean, uniform appearance. Then clean with gasoline, reinsert and replace the regular spring and cotter. Remember that the valves must be returned to the openings from which they were taken. Always grind the valve in the seat in which it belongs. A good idea is to tag the valves when they are first removed so they will not be interchanged.

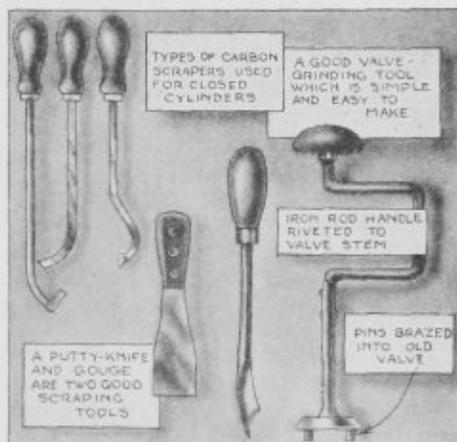
When the valves are again in place,



Carbon Will Settle in the Greatest Amount at the Points Here Illustrated

wipe off the cylinder and piston faces, set the gasket, which has been coated with shellac, in place and then bolt on the

head. Do not take up the bolts at once. Turn them down fairly tight, run the engine a few moments until warm and



then tighten the bolts to the limit while the motor is hot. In this way the gasket will set itself and prevent gas leakage.

With the usual types of carburetors and the present fuels used, it is almost impossible to prevent carbonizing, but the formation of carbon can be checked by judicious care of the power plant. Use the best grade of oil you can possibly buy. Adjust the carburetor so that the mixture will be as "lean" as possible yet give maximum power. See that the valves seat properly and that the piston rings are tight so oil cannot be pumped up from the crank case.

Remedies, chemical liquids, for removing carbon without manual labor have been offered to motorists. These preparations usually have secret formulas and are to be poured into the gasoline or into the cylinder chamber. Some are good, but the absolute and sure way to know that you have a perfect combustion chamber in your motor is to demount the engine and scrape the carbon by hand.

From the accessory standpoint one of the best preventives is the water injector. Several types are on the market. They simply allow a small amount of water to be drawn into the carburetor with the gasoline. This water turns to steam under the heat of the cylinder gases and softens accumulated carbon which is then blown out by the exhaust. Furthermore, this steam has a tendency to increase the power of the explosions and thus give more "pep" to the engine.

You Can Monogram Your Car

by A. REINHOLD NIELSEN

A MONOGRAM on your car gives it a finished touch and also a definite element of individuality. This is especially so with a monogram of original design. The average motorist, however, does not like the idea of leaving his car in the paint shop for a day or two in order that he may have monogrammic distinction.

The good news is that there is no real necessity for laying up the car, for the monogram can be put on by the owner and, if it is carefully watched so that no one brushes against it, the car can be used at once. But how, you ask, is the owner going to put on the monogram if he is not experienced? Technical experience is not necessary.

If you have an artist friend, or a draftsman friend, or if you have some personal ability in those lines yourself, you will have no difficulty and will undoubtedly enjoy the actual work. First, decide upon the size and location of the monogrammic design, select your initials and work them into scroll. Endless com-



FIG. 1

Some Sample Designs for Monograms

binations can be worked out, the main element to watch being an even balance of the letters. That balance will have a great deal to do with the satisfying nature of the selected design. For the benefit of illustration, a few are here worked out as shown in Fig. 1.

The tools necessary are a small camel's-hair brush, a little white shellac, a piece of heavy paper (not cardboard) about six inches square, a spoonful of

white japan dryer and the oil color of the shade you have selected. It is most harmonious to make the color of the monogram the color of the car's striping. Gold monograms look well, but they will not last if gold bronze is used. If a gold monogram is much desired, an entirely different method of procedure is necessary. This method is told farther on.

The design should be drawn on the paper and the paper given a coat of thin shellac to prevent suction.

The letters of the design should be about one-sixteenth inch thick, and all letters having free centers, such as the letter B, Fig. 2, should have the centers retained by binders.

Now all slfaded portions, as illustrated in letter B, should be cut out with the point of a sharp knife so that when the paper is held up to the light the design of the monogram can be seen open through the paper. With this stencil then placed over the spot on the car where the monogram is to be located, a mixture of color and japan should be painted into the cut-open spaces of the paper with the camel's-hair brush. Care should be taken not to get too much paint into the stencil as the paint will then run. If the first trial is not successful, wipe the stencil off with a clean cloth and try again. A half-dry brush is best. Work carefully and do the painting neatly. When the paper is removed the design will be left on the car in a satisfactory manner. If the letters used had binders, fill these in with the point of the brush.

If a gold monogram is desired a 4-inch-square sheet of gold leaf should be procured. The mixture painted over the stencil should then be clear varnish and japan. When dry to the point of unsmearing stickiness, the gold leaf should be laid carefully on with a dry camel's-hair brush. The sticky varnish will catch and hold the gold leaf on the design only and the ragged edges which will hang about can be brushed away when the varnish has entirely dried.

The next day, when the monogram used has dried, it is well to give it a light coat of protecting varnish. This final coat will make it last a great deal longer.



FIG. 2

SWINGING EASILY FROM FLORIDA TO INDIANA

How I Rode with Ease and Comfort Twelve Hundred Miles Over Mountains and Water-Soaked Roads in a Small Sedan

by FLORA A. D. KITSON

ALL the roads between Florida and Indiana are not, as yet, good roads. In fact, automobile tourists returning North after a winter spent in the

weight. This obstacle is met by the use of an independent frame of iron pipe, which reaches just under and across the top of the car and down the side, opposite the driver's seat, where it rests on the floor. The frame is held securely in place by three metal bands neatly fastened to the frame of the car by six small screws.

The sedan "removable" seat is swung from the crossbar on four small chains linked to two 1- by 8-inch spiral springs, thereby eliminating all percussion bumps as well as absorbing sudden jerks and jars—so injurious to a sensitive spine. The bottom ends of the chains are attached by snaps to the four corners of the seat and hold it in position. The seat is adjustable to face either the front or the rear of the car. A center upright rod may be screwed into a "T" coupling in the top bar if greater solidity is desired.

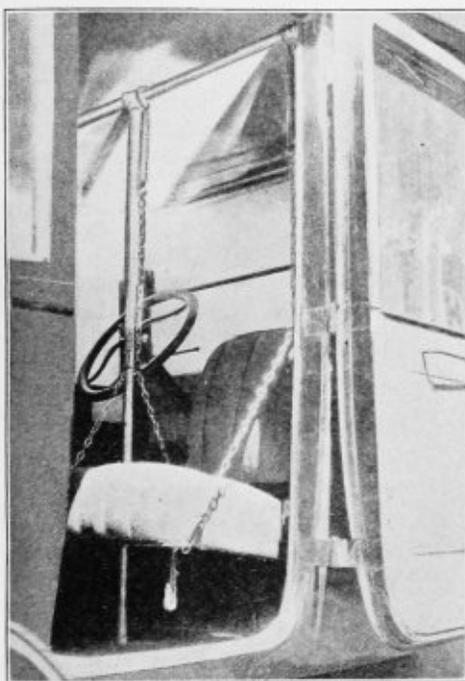
When not in use the entire equipment, except the small black frame, can be easily and quickly removed by unsnapping a few connections.

Anyone capable of driving his own car is able to assemble the outfit. The materials required are neither expensive nor hard to obtain. Any plumbing and hardware store will have the necessary items. The cost is not great, as may be seen from the following list:

Cost of Construction Materials

12 feet $\frac{3}{4}$ -inch pipe.....	\$1.20
4 2-inch rings20
2 8-inch springs	1.00
10-foot chain60
1 "T" coupling10
2 "L's"20
2 8-inch links10
4 snaps40
Total	\$3.80

With this device we were able to travel a greater number of miles each day. Hoosierdom and home were reached on the seventh day without a single subluxated vertebra.



The Interior of the Sedan Was Rigged Up with Seats Suspended from Springs Similar to Those Which Float the Bed of an Ambulance

South encounter heavy sand, cobblestones, mud and almost bottomless ruts. Four trips literally drove these truths into my body.

The hope to accompany my husband from our Florida home to our Indiana home in Maytime came with a directness that was compelling. This hope, plus necessity to spare my spine further injury, was mother to the simple invention.

The ambulance plan—suspending the patient in the air—seemed feasible. But the sedan top, unlike that of the ambulance, is not built to carry additional

FROZEN BEAUTY AT OREGON

WATERFALL IS RARE SIGHT

by NAOMI SWETT

DURING the past winter, Oregon had a brief snap of real cold weather. Following the freezing spell it rained and a "silver thaw" followed. It was under such freak weather conditions that Multnomah Falls presented a rare sight and one not to be equaled for beauty. A gorgeous layer of ice and fringing icicles hung from the rocks and vegetation below the falling water. The flash of the sun's rays upon this frozen creation reflected a myriad of gleaming colors.

Tourists using the Columbia River Highway find in the falls a spot of magnetic interest for they are the highest and most beautiful falls on that wonderful roadway. The water takes a sheer drop of six hundred feet into a rock basin below. A heavy growth of ferns, pine, fir and wild shrubbery contributes harmony to the background for, like other Oregon vegetation, it remains green all the year around.

Benson's Bridge, joining the two chasms, is a favorite viewpoint for the motorist, who from here can see the falls plunging into the Devil's Punch Bowl, the lower rock basin. When the sun shines, the spray-filled air is rainbow-tinted.



WOMEN'S CARS IN SPRINGTIME

WITH the full bloom of spring, milady's car, which served her so faithfully through the rigors of the winter months, begins a new and wider usefulness. The car is pressed into service oftener, shopping trips become real pleasures and, because of the invitation of the warm



COURTESY BLOOMING PICTURES

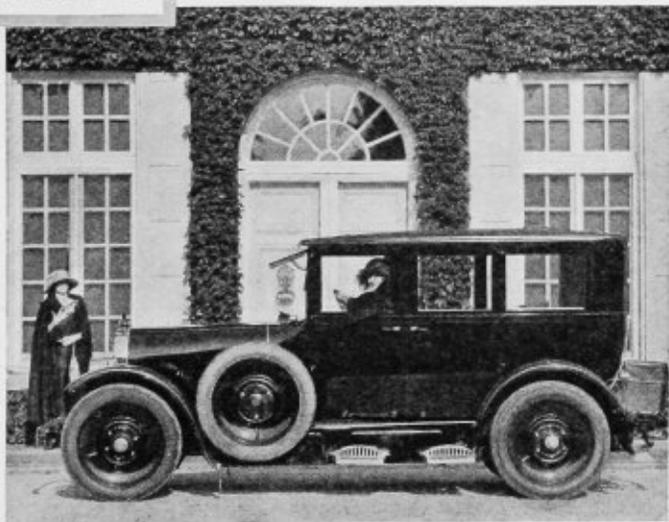
to rebuild the tired nerves which have resulted from the confining, winter duties.

The sedan is still in favor, for its luxurious qualities make a strong appeal to the woman driver. However, as the summer will surely prove, the unbounded freedom of the open touring car and camping outfit will soon rise as a seasonal suitor for her choice.



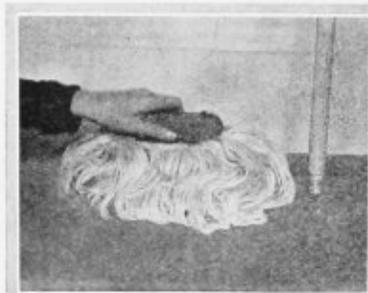
sunshine and the bright, new-life foliage, more drives into the country are taken. These give rise to plans for outings and tours—the prospects of which are always pleasant.

The parks and woodlands enjoy her presence again—a day in the latter natural surroundings gives rest and recreation that goes far



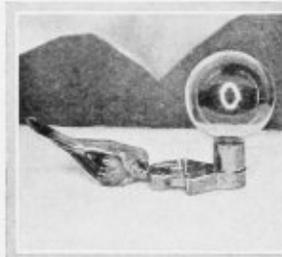
COURTESY M. S. S. CO.

CONVENIENCES FOR THE HOUSEWIFE



Mop has two handles so that it may also be used as a scrub cloth with a convenient holder

Paper finger bowls are now being used in the home. They are artistically decorated. Almost any color scheme can be matched



Fresh water will flow for a week with this sanitary drinking fountain for your bird. Water is kept clean and flows into the lower trough



Center—This girl has been making her hats for a year from crepe paper. The paper is cut into strips and braided, sewn together in the desired shape and then given a coat of shellac

Below—A practical combination of bassinet and baby carriage which permits of the child's being tucked in the bassinet while in the house and carried outdoors to be placed in the carriage by simply lowering the bassinet into the vehicle



Nail buffer has renewable chamois buffing strips that are tightened by thumb pressure

A set of Windsor chairs permit three chairs to occupy the space of one. Extra chairs always ready





KEEP THE FAMILY WOOLENS WOOLLY

Even Shrunken Woolens May Be Restored to Their Original Size and Made Soft and Fluffy Again by the Right Laundry Methods

by MARY ELIZABETH ALLEN

AT this season you will be putting away your heavy sweaters, your blankets, and the family's winter underwear. If you would be sure of having nice, woolly woolens when you resurrect them from their cedary and moth-bally embalmment with the first snappy days next fall, it is necessary to observe some precautions now about washing and putting them away properly. Even baby's woolens, and your brushed wool scarfs may be washed without shrinking, and kept as soft and fluffy as when new, provided you go about it in the right way.

Wool, you must remember, is a very delicate fiber, because it comes from the back of a living, breathing animal; and it is just as sensitive as the tissue on the back of your hand to strong alkali soaps, and heat or friction. These fibers are microscopic in size, and covered with tiny scales that over-lap. That is why wool should never be rubbed or twisted in washing, nor exposed to extremes of

heat or cold, as this causes these little scales to become twisted and knotted together; when wet the little "teeth" expand, catch in one another, and become tangled, so that when your labor is over, you have a fabric that is thickened and

board-like and matted, instead of the soft, fluffy garment you had anticipated.

While the woolly coat is yet on the back of the lamb it is kept warm and soft by a natural fat called "lanolin." In order to keep your garments woolly it is necessary to leave this fat in the fibers. When you use water that is too hot, or a soap that is too strong, it is removed. And that isn't all, for

strong soaps dissolve wool, first making it "tender" and then causing it to disappear altogether.

But fortunately wool is something like hair in that, because of its luster and gloss, it does not hold dirt so tenaciously as the vegetable fibers, linen and cotton, and so is much easier to clean.

The first step is to give the garments

WHEN WASHING WOOLENS

Have all waters of the same temperature—about 110 degrees F.

Rubbing and twisting causes wool to harden and felt, and the better your grade of wool, the quicker the felting.

Strong soaps cause wool to become "tender" and dissolve the fibers.

Soaps should be in solution—to save rubbing.

Borax and ammonia may be used to soften water as they are too mild to injure wool.

If dried before a fire hot enough to "steam" the woolens, they will shrink just as if they had been washed in water that was too hot.

Ironing with a hot iron shrinks flannels and turns them yellow.

or blankets a good brushing to shake free all loose dirt, lint, and other particles. Have plenty of soft water, heated until just pleasantly warm to the hands—not more than 110 degrees Fahrenheit. Hotter than that will shrink the flannels while cooler will not dissolve all the dirt. First make a soap solution, using the mildest white soap you can find, add this to the tub and whip quickly into a stiff suds. Never rub soap directly on the garments. A little borax or ammonia will help take the dirt out and is too mild to injure the wool.

Take the cleanest and lightest-colored pieces first and put them, one at a time, into the suds. Then knead, punch and souse them up and down until the suds are driven through all the meshes—but do not rub. Wringing and rubbing causes the wool to harden and felt, and the better your grade of wool, the greater and more rapid will the felting be.

As soon as the water become soiled, change to another which is soapy and of the same temperature as the first and carry on the same squeezing, kneading operation until the flannels are clean. After the last rinsing in water of the same luke-warm temperature, and in which a little bit of the suds have been left, in order to restore the animal fat lost during the washing, the water should be pressed out gently, without wringing or twisting, and without any lifting or pulling that might stretch the garment.

Consider now the drying, lest all your caution in the actual washing go for naught. If the weather is fine and breezy, woolens are best dried outdoors as this

will help to fluff them. If the drying must be done indoors, they must dry quickly to prevent shrinkage, but not too near the fire. Remember, if they get hot enough to "steam" they will shrink just as much as if they had been washed in water that was too hot.

Woolen garments should never be hung. Lay the article out on a thick pad made of bath towels or folded sheets, and pull and shape it to its original size. Some housekeepers measure the sweater or union suit before wetting and write the figures down to check up the garment while drying. If it is necessary to hang the blankets, they should be placed with exactly one-half their weight on either side of the line; this is better than allowing an uneven proportion of their weight to sag on one side. A better way yet is to dry them on curtain stretchers.

Woolens are better without ironing. Blankets should be brushed

with a stiff whisk to raise the nap and fluff them, then laid away in soft, even folds. Fine flannels that seem to need smoothing out may be gone over with a rather cool iron and then rubbed gently with a piece of flannel, or bath mitten, to restore the fluffiness.

Even if your woolens have already been hardened and shrunken by careless washings, they may often be restored to their original size by this method and after a few launderings may become soft and fluffy again.

The joy of having perfect woolens is, after all, a real reward for the trouble one must go to in order to have them. Housewives will agree with this statement.



After the Last Rinsing, the Water Should Be Pressed Out Gently Without Wringing or Twisting

THE PROPER CARE OF FURS

Furs May Be Kept in Good Condition for Years and Years if They Are Given Due Attention When They Are Stored Away

by JULIA W. WOLFE

WHEN it is time to put furs away in the spring, give them a thorough cleaning. Cold-storage plants and cedar chests make excellent places for moths to breed and sleep in. There are many preventives, such as moth balls, cayenne pepper, spices and tobacco but, if the moths are not shaken out, these are of no avail.

Moths lay their eggs in warm and secluded places, and there the eggs remain until time for hatching, no matter how cold the temperature to which they are subjected. If the temperature is normal when the furs are taken from the cold room, a little white worm soon crawls out from its abode and begins to work. Its work is many times more costly than that done by the housebreaker.

The first thing to do is to beat the furs thoroughly with a flexible rattan. The glutinous eggs will drop out of the furs if they have not already become imbedded in the little tufts of hair that the worm rolls up in the beginning of its destructive work. The best thing then is to comb out all the small wads that contain either the eggs or the work or both with a stiff aluminum comb. The loose hair that the worm has eaten off will comb out in the process. If bare patches of the pelt are now to be seen, they show just how much of the fur the moth has eaten, and what places need to be repaired. Nothing is to be gained by letting the loose fur remain in the garment for the sake of covering up the bare spots, and great loss may come

from leaving it if the worm or larva is still there.

After the furs have been carefully cleaned, they may be wrapped in clean paper and pasted securely. So far as safety from moths is concerned you may now send them to the cold storage or place them in a cedar chest or simply leave them as you have them packed. Use great care in beating the furs,

because some of them are less durable than others. The pelts of squirrel, mole, Persian lamb and muskrat are not so thick and heavy as those of Alaska seal, beaver, otter, skunk, raccoon and sable. A fur that has been dyed requires more care, too; exceptions to the rule are the Alaska seal, the skunk and the raccoon. Moths avoid the dyed fur if they can get at the natural-colored and more

valuable furs which they fancy more.

Remember that when your valuable furs are lying about uncared for the moth is always on the alert and has an enormous appetite. Moths' eggs are smaller than a pinhead, and the worm is very minute.

If you want to have natural-colored furs retain their beauty, do not put them in the sun with the idea of freeing them from moths. It is not necessary if you have followed the instructions given here, and you will only fade and bleach them. Keep them in the dark when they are not in use and they will retain their color for



To Find Moth Holes in One's Furs Is Enough to Bring Tears to the Eyes of the Most Stout-Hearted. The Time to Prevent Such Disaster Is When the Furs Are Put Away

years. Pure white angora fur can be cleaned with naphtha better than any other fur. Lynx has a tendency to shed that is quite noticeable if the fur is not dyed. White Japanese goatskin made into rugs often sheds hair most annoyingly. There is not much that can be done in such cases because of the natural tendency of the fur. Whipping does little good; the only thing to do is to have the

then apply cold water with a brush moved in the same direction the fur runs. Hang the garment up to dry, but keep it away from the heater so that the hair will not curl. When it is quite dry, whip it smartly with a rattan, and you will find the fur fresh and glossy. Most of the fur-bearing animals like water, so do not be afraid of spoiling your furs by glazing them, though you must never



It Is Important to Shake the Furs Out Well Before Putting in the Larvae Preventives. Don't Be Sparing with the Moth Balls. Moth Balls Are Cheap but Furs Are Expensive

furs dyed so that the shedding will be less noticeable. Rugs made of the skins of bear, tiger or leopard require much attention to keep them free from moth.

If the collars on your furs appear matted and greasy—the result of having come in contact with your hair—get some fine sand and a little mahogany dust from a cabinetmaker. Mix and heat in a frying pan. Cover your soiled collar with the hot mixture and rub it in thoroughly with a stiff brush, or with your hands if it is not too hot. Never burn the fur. Now beat the sand and sawdust and you will find that the collar looks new and clean.

Paint or oil can be removed in the same way, after using the comb to raise the matted fur. Beaver, otter, mink and sable may be cleaned beautifully this way, but ermine, or its imitation, should be cleaned with corn meal and salt. Apply as you did the sand mixture, but without heating. It will make the fur look almost new. Take care never to get your mixtures on fire. Put them away in a tin receptacle for they may be used over and over.

Many furs are glazed in the fur shops before they are sold. To glaze a coat or a muff, first clean it by beating and

soak them. Seal, muskrat, otter, black marten, fox, badger, Siberian squirrel and mink are all improved by glazing. Rain, snow or glazing has a tendency to curl plucked beaver, but the tendency may be overcome by combing and beating the fur.

Simple Clothesline Tightener

WHEN a clothesline is stretched tightly around in a yard from several poles, it will eventually get longer and sag. This, of course, can be remedied by untying the ends and taking up the slack when necessary, but to do this is not always easy because the knots have a tendency to bind when exposed to the weather. Such knots are often difficult to readjust. A better way, which avoids the knots, is as follows:

Run the line through holes in the posts and tie one end of the line. The loose end should then be fastened to a boat cleat fitted low on the last post so that adjusting may be done with convenience. When slack occurs, simply unwind from the cleat, pull up the slack and then lash to the cleat again. This method of tightening clotheslines saves much time and always provides tight lines.

HOW TO SAVE MONEY WHEN SHOPPING

"What Do You Call This Shoe?"

It is said that the wasting of a single shoe by each person in the United States costs the country at least \$250,000,000 a year. Shouldn't these stupendous figures jar us into a realization that our shoes should be bought with care and that everything possible should be done to prolong their life?

by MRS. HARLAN H. ALLEN

"Side leather" simply means that the skin is from the side of the animal.

Side Leather "Glove-shoe" leather usually means leather that has had the grain removed and been given a satiny finish. Coltskin is very satisfactory, being about twice as strong as calfskin and, because of its tight texture, more nearly waterproof than any other leather. It is considered especially serviceable for patent leathers. Suede shoes are made from either kidskin, calf, or cowhide. The suede is very beautiful, because of its velvety, napped surface, but is less suitable for everyday wear than calfskin that has not been treated to the suede finish.

Satin shoes are especially desirable for dress wear, because of their beautiful lustrous surface, and because they can so easily be matched to almost any color of costume.

Satin and Silver They are not so strong or durable as leather. Gold and silver cloth are made from threads of metal. The greatest disadvantage of these is that they are apt to tarnish. Aluminum cloth looks like silver cloth but does not tarnish.

The material, color, appropriateness, and cleaning possibilities are all important points in deciding whether one cloth shoe is better than another.

Whether it is due to vanity or not, there is no one thing that women shoppers are more concerned about when buying a pair of shoes than the heel. Now this perfectly feminine trait is not altogether to be scoffed at, for quite aside from the style and the verve that a neatly turned heel can give a trim foot, it has a lot to do with the comfort and poise of the body,

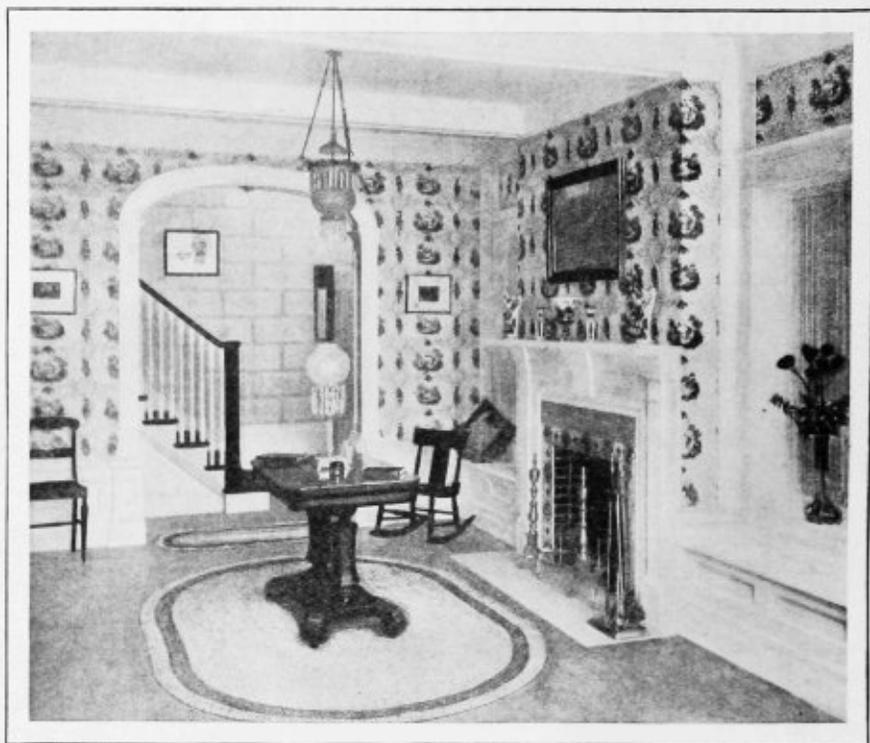
and, whether you are aware of it or not, with the service you are going to get out of the shoe.

Heels are cut out of wood and covered with material to match the rest of the shoe, or they are made of leather substitutes, or entirely of leather. The leather ones are the most expensive. However, when the heel is made of leather, you may know that it will be absolutely satisfactory under all conditions. Sometimes leather substitutes or wood are used for half the heel and the last three or four lifts are made of leather.

The wooden heels are lighter in weight and cheaper to produce than the leather ones. They are considered very good-looking, because they can be covered to match the rest of the shoe. Nearly always the top lift of a wooden heel is made of leather to increase its wearing quality.

Leather heels cost more, but are more durable, giving better wear and being more easily repaired. They are made up of little flat pieces of leather cemented together. By looking closely, you can see the faint ridges, where the pieces of leather, which we call lifts, are put together. If you want to be real sure whether the heel is made of all leather, just take the point of a pocket knife and press it on this part of the shoe, having the blade parallel with the layers. It will readily sink in, if the heel is of paper or leather substitutes, while real leather will resist quite heavy pressure. Usually if paper is used, it is to be found in the upper sections of the heel.

The way in which a heel is attached has a lot to do with the wearing quality of the shoe.



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Modern Home Decoration

Artistic Treatment of Interiors and Furnishings

by ODA ALEXANDER



COLONIAL interiors are popular because of their cheerful note of creamy lightness. Papers for such rooms are usually of some quaint pattern with flower designs which unite by means of bows or ribbons. These ribbons cover small areas but are bright blues, yellows or pinks. The cream background and the livelier, light floral designs and ribbons give a delicate and dainty effect. This effect is further heightened by coupling with it the customary white or ivory enameled woodwork.

The woodwork of the above room is enameled in five coats of light ivory enamel as is also the trim of the hearth or fireplace and the hall. The wide, arched doorway leading to the hall gives an impression of spaciousness, grace and welcome. The walls of the hall are decorated with imitation Kaen stone,

which is used a good deal for that purpose at the present time. Kaen stone paper is simply the artificial reproduction of the appearance of the walls of ancient castles which were built of large blocks of stone and the inner surfaces facing the rooms undecorated. Kaen stone is mined at Kaen, France. The effect of a wall of this stone is now procurable in the form of wall paper.

When colonial harmony is desired, the furniture should of course follow the trend of the period. Furniture of the time includes the Adam style, originated by the Adam Brothers and recognized by the oval medallion of those makers; Chippendale is also included with its Chinese influence; Hepplewhite is recognized by the heart-shape design, found particularly on the full chair backs; Sheraton has the strict straight lines and line inlay of that maker.



A LITTLE ENGLISH-STYLE HOUSE

by CHARLES ALMA BYERS

THIS house of six rooms and bath is built with outside walls of white cement-stucco over metal lath and wood framing, a roof of wood shingles painted in gray-black, and with a foundation of concrete. The entrance is designed with an attractive little vestibule porch having an open arched doorway in the front and in the back wall one similarly arched opening directly to the living room. Other enhancing features of the front are a prominent window bay to the right of this entrance and a small terrace on the corner. A little side porch, with a latticed *portecochère* reaching out from it, lends further attractiveness to the exterior. Dark red brick is used for the chimney and for flooring the entrance and the terrace, as well as for framing the outer doorway. All wood trimming, in-

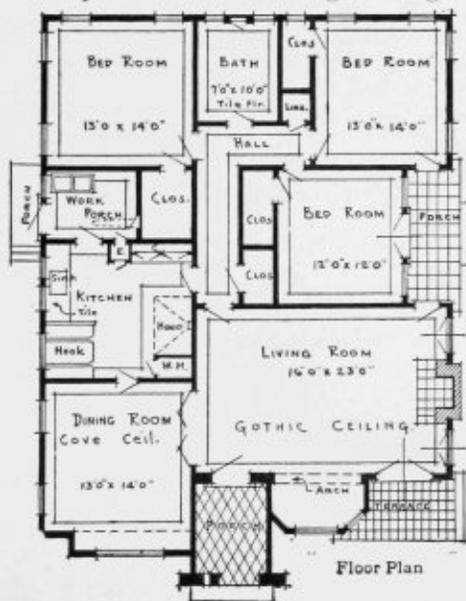
cluding the decorative timbering of the front gable and the upper walls of the window bay, is dark brown.

The accompanying floor plan is deserving of study. It will be seen that the center hall directly connects with every room except the dining room, thus making the arrangement unusually convenient. Closets and built-in features, including a delightful breakfast nook in

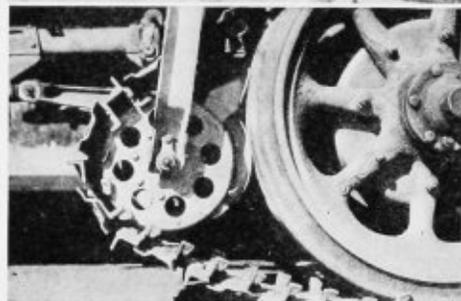
the kitchen, are shown in the plan.

The woodwork of the living room and dining room consists of pine in old ivory finish, with a limited use of mahogany trim. Walls of the two rooms are plastered with cement and painted. The ceiling of the former is designed in gothic style, and that of the dining room is finished with a plaster cove.

The house is 37 feet wide by 51 feet deep, including the entrance.



A DEVICE designed to give traction in the operation of trucks over any kind of road, or off the road in mud, plowed ground, sand, and

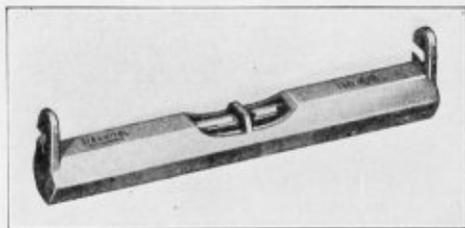


Caterpillar Attachment for Soft Roads Is Removable

snow, was recently tried out with success in southern California. The device provides for use in an emergency something of the universal mobility of a caterpillar tractor. The tracks can be attached or removed in about ten minutes. When not in use they are carried on reels located under the body immediately behind the rear wheels.

The inventor is now developing a modified form of the truck attachment for use on passenger cars.

THIS line level is constructed from $\frac{3}{8}$ -inch aluminum tubing, hexagonal so that it may be used as a surface level.



New Aluminum Line Level

The weight of this level is only $\frac{1}{2}$ ounce, so that sag in the line is eliminated. It is useful for laying foundations, tile pipe, cement and brick walls, working ditches, determining grades, building roads, etc.

The level has a specially constructed slot which prevents it from dropping off the line when in use. It is furnished with luminous level glass with yellowish fluid which makes it easy to read.

A NEW idea in work garments has all the appearance of the ordinary one-piece overall suit, but in reality it is a two-piece suit so fashioned as to be



Overall Idea Is Improvement

absolutely dust-proof. The suit consists of a jacket and trousers. The jacket has a waistband under which are fastened tabs which button on the trousers. It is especially convenient in that if the trousers wear out or become torn it is not necessary to throw away or discard the entire garment as is the case with the ordinary overall. The garment has no

overlapping bibs or flaps and is easy to wash. There are no buckles and no elastic to stretch and loosen.

This work suit has an invisible drop seat that enhances the appearance and permits convenience. The garment when fastened together may be put on and taken off as a one-piece suit and when buttoned is dustproof. It has no bibs, strings, double folds, buckles or catches to bulge and dangle and get in the way, and permits great freedom of action, especially for the mechanic or car owner.

INVENTION

A RAKE cleaner invented by Dewey N. Humphrey, of Blue Creek, Washington, has a perforated cleaning plate mounted above the teeth of the rake. This perforated plate has upstanding arms through which extends a rod. Pivotaly attached to the rod and to the shank of the rake is a bell crank lever which connects the cleaning plate with a sliding arm mounted on the handle of the rake. This sliding arm terminates in a handle by which the cleaning plate may be operated to force off any leaves. The invention is shown in the illustration below.

A BIRMINGHAM, Alabama man, has invented and patented a machine for the extermination of the potato and bean bug and cotton boll weevil. The machine has been tested and has proved a success. It is light, simple of operation and very efficient.

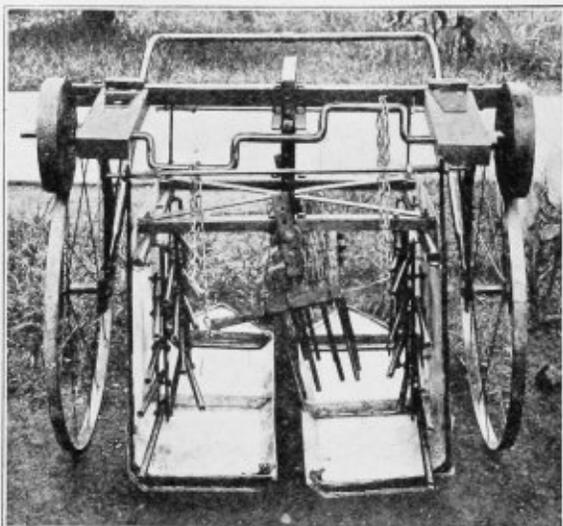


Rake Cleaner Saves One from Bending Over to Clean Teeth of Rake

Two sizes of the machine are made. A small one for potato and bean bugs and a larger one for the cotton boll weevil. The small machine is operated by hand and the larger one by horsepower.

At the top of the machine are two wheels attached to an iron bar. These wheels are revolved by coming in contact with the wheels on which the ma-

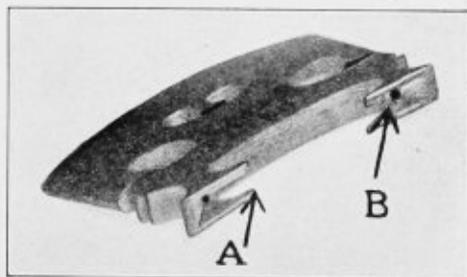
chine moves. The bar at the top of the machine, on which the two small wheels are attached, gently move a number of vertical and horizontal springs near the



Bug Exterminator Shakes Pests from Plants and Drowns the Parasites in Coal Oil

bottom of the machine. These springs, in their movement, brush the insects off the plants and into the metal troughs in which is coal oil to kill the bugs.

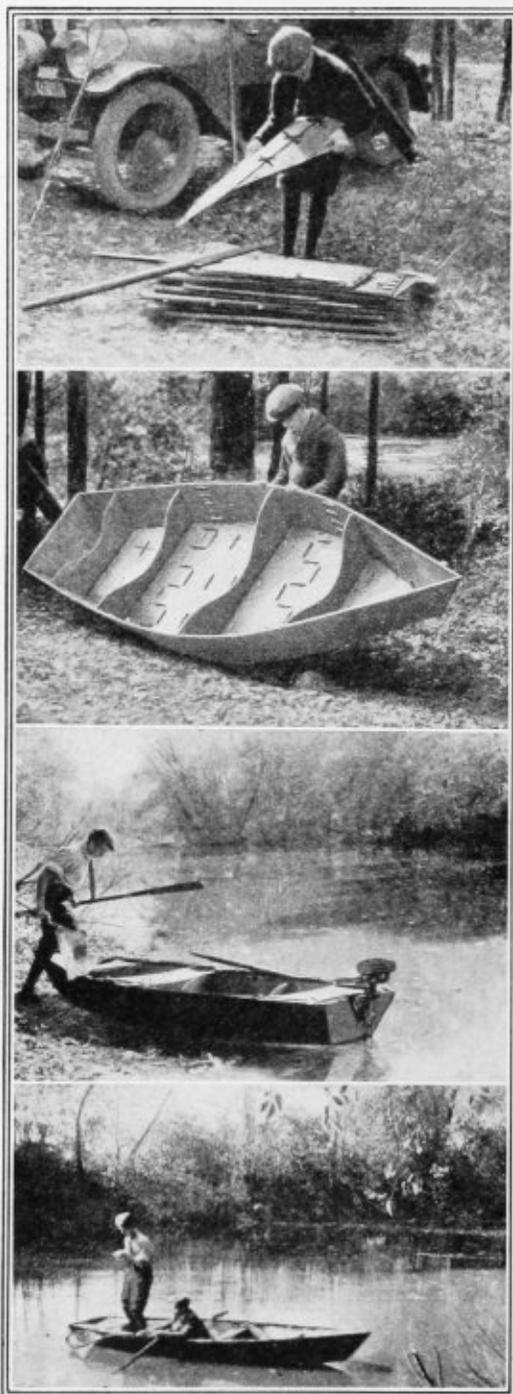
IN this violin bridge a channel is formed from its waist. The channel runs through the legs to the ankle of the bridge, where it terminates and a sound box is formed. Instead of being blocks of wood the feet are delicately chiseled out and perfectly balanced. It is claimed that this arrangement allows a greater volume of sound to travel through.



Violin Bridge Improves Tone of Instrument

AN INGENUOUS FOLDING BOAT

Is Built of Sections and Can Be Quickly Assembled



A BOAT of interest to every boy and to every automobile tourist and camper is shown here. It is so simple to assemble that one boy can put the boat together.

It is the invention of a man who is fond of the out-of-the-way places in the northern woods. In order to reach these secluded spots he was called upon to build a boat that was light, safe, easily transported and capable of being demounted and carried about easily. The boat pictured is the result of his efforts and, to the credit of the inventor, the creation he involved meets every test for safety, endurance and compactness.

The boat is built of three-ply laminated boards and consists of twenty-one sections which lock together by means of metal fasteners. No bolts or screws are required and no tools are necessary for the assembling or taking apart of the craft. Over the assembled sections is drawn a canvas cover which is stretched tight by drawing up on the seat straps. The canvas seats make very comfortable, cushion-like saddles.

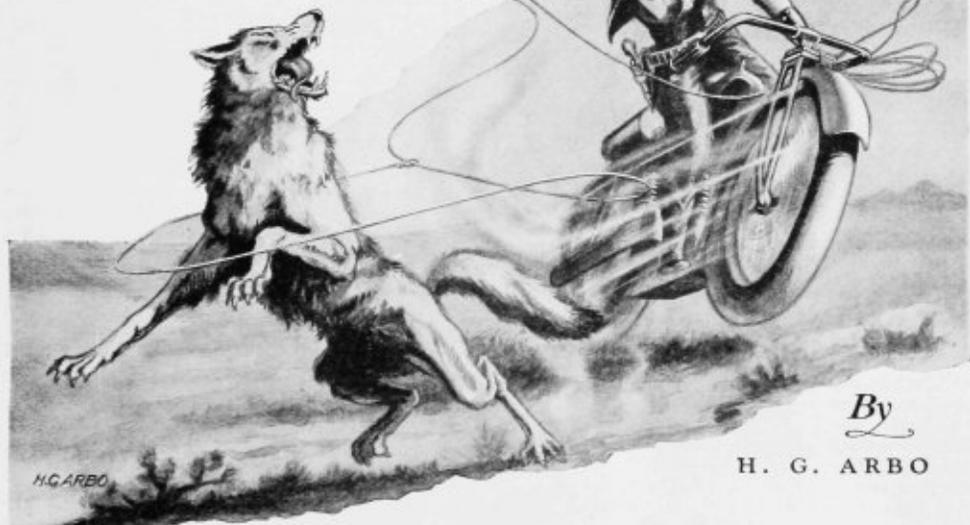
The boat will hold three full grown persons and provision is made for the attachment of an out-board motor if one is desired.

It is 12 feet in length. When packed it folds into a box 12 by 18 inches. Such a box is easily carried on the running board of an automobile, especially since the entire outfit weighs less than 100 pounds.

The boat shown was part of the equipment for a motoring trip in the northern woods. It was used on five lakes on which there were no boats whatever and was carried in the case on the running board of the car during the 1500 mile tour.

This boat will appeal to all fishermen, motor campers and boys who have camps at different locations each season.

WHITE WOLF of THREE BUTTES MEETS a STRANGE FATE



By

H. G. ARBO

"DRAST that wolf," exclaimed Bob Murray, as he slid wearily out of his saddle, unbuckled the cinches, turned his tired horse loose in the pasture and strode toward the T. U. bunk house with a half dozen lean and dejected hounds at his heels. "What's the use of havin' the fastest cow-hawse and the best pack o' hounds in Blaine County when there's a freak o' nature like him running loose outdoors?"

The "freak" referred to was a monster white wolf who with his two buffalo gray companions had been the cause of much consternation among the ranchers south of Milk River in the Three Buttes country in northern Montana. The havoc wrought by this trio amounted to a loss of thousands of dollars yearly. For several years this marauding pack had been active and it was only after many futile attempts that the two buffalo grays were run down and captured.

Time and again organized parties of cowboys had set out on their fleet-footed cow-ponies with packs of hounds to capture the white wolf but they always returned with the same story—the wily beast had outdistanced or outwitted them.

As Chet' Speak-Thunder, a young Carlisle-bred Sioux, once said: "The critter seems to be protected by the Charm of Manitou."

As a matter of fact the animal did seem to possess a supernatural speed and endurance and eluded his pursuers on each occasion.

"He can't be caught," said Bob, with an exasperated gesture. "I ran him for sixteen miles, an' he just played with me. The thing is spooky, I tell you."

Jay Rhodes, foreman of the T. U. and one of the cleverest riders on the range, glanced up from the bunk in which he was lying. All the night before he had worked secretly in the locked shed behind the windmill, wherein he had spent many days in silence. Occasional rapping, tapping and popping from within the shack stirred the deepest curiosity of the men.

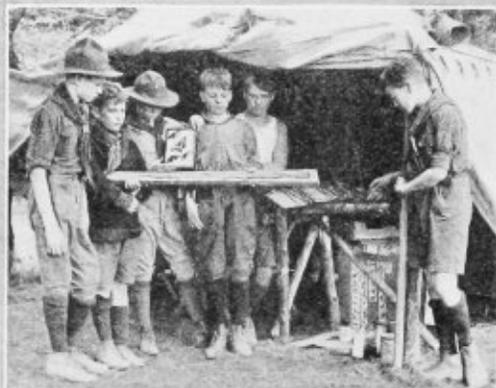
"Spooks, nuthin," Rhodes said. "That wolf has just got you guys goin'. That's all! Boys, if we are ever goin' to catch that wolf we have got to show more speed and I'll take that job in hand."

"Blaa-ah! you talk too much" spat Bob.

Thereupon Jay leaped from the bunk

(Continued on page 436)

THE BOY'S WORLD IN PICTURES

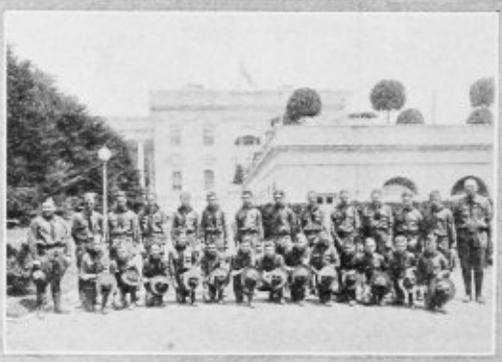


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A group of Boy Scouts gathered relics, butterflies and other material to exhibit to some boy friends who could not come. They have a snake's skin fastened on the board



Fishing is great sport but it is better with a radio set. Concerts and news brighten this boy up and make the waits between bites enjoyable and interesting



Below—A city boy milking a country cow. This would be real work for a country lad but for this city boy is it a new experience

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Knowing President Harding as the friend of the Boy Scouts, a delegation of them calls at the White House almost daily



Below—Springtime means outdoor enjoyment. During the long winter these three boys built this sailboat—now for the fun!



THE BOY and the MOTORCYCLE

By John Pierson



THE boy is by nature mechanically inclined. This is proved by his first chosen pleasures being in some way connected with small steam engines, electric trains and other similar toys. However, as he grows older, his toys grow larger, taking on the form of wagons and pushmobiles, racing-coasters and other vehicles of the four-wheel style. These, in turn, give way to the bicycle which is capable of covering a greater territory.

When the boy has outgrown the bicycle, he is ready for something which is even more complicated and for that reason more interesting. He finds his choice in the modern motorcycle. It is small enough to be handled well by a grown boy and powerful enough to be able to take him to any place in comfort. Its motor is a real motor that purrs and chugs with a throb that is music to any red-blooded boy.

In the thrill of its control, as he speeds over pavements and undulating roads, he finds a new mastery and delight that gives him added confidence in his growing powers. The mechanism, being of a very practical nature, is the sort that educates him with a mechanical knowledge which will be of real value because the underlying principles involved are used in other forms of machine construction.

The motorcycle is a sort of introduction into the sphere of the automobile. Because of its swiftness and agility the

motorcycle has a claim in its own right to be the vehicle of youth. It darts like an arrow, with sure footing, full of vigor like its young rider, seemingly in exuberant joy by simply being in lively motion. When many of these riders and vehicles travel in groups, the pleasure is multiplied.

Motorcycle clubs are popular with boys and young men because they find kindred spirits full of the fire of youth and the joy of travel. The country roads are to these happy groups a great map to be explored and traversed as their fancy leads. Explorations are all the more zestful and enjoyable when made with congenial companions.

No land is too distant. The brooks a hundred or two hundred miles away are as accessible as the creek near home. The fish of some far-away lake are caught and added to the store of trophies. Camps in the woods, miles away, are as if they were but over in the city or town park, except that they are in the thick of the woods and in the tang of the pine and cedar. Every wonder spot reaches beckoningly to riders of the motorcycle.

Nor is the sweetheart forgotten. She rides in the comfortable side car sharing the thrills of her companion in their whizzing journeys. She is thus enabled to enjoy the comradeship, the health and happiness of motorcycling and to be a pal who makes good things better.



BUILDING THE HIKER-BIKE

by ROLAND B. CUTLER

THE bicycle is the boy's flivver, and with the Hiker-bike congenial spirits can go "bike-hoboing." All construction is boy's work, but the building must be done carefully, so as to have a reliable outfit. A 26-inch wheel may be used by adjusting leg construction.

With the 4-inch corner irons, attach the end pieces to top piece, one even with a rear end and the other 4 inches from a front. Bore the stem hole, and secure shoulder blocks with screws and toenail so that the top piece will set at right angles to the forks.

Center the sheet steel over the top piece, squared with the top by nailing down the end pieces—each side, with small nails. With the wheel removed, attach the duck sides, each 25 by 52 inches long. Turn over 1½ inches for an inch hem at the top. This leaves 1½ inches to clinch all around.

With 8d nails, clinch the duck to end pieces with the 21-inch strips. Then assemble a bottom 28-inch side strip and two 8-inch strips with 3-inch stove bolts. Finish a side with a turned over edge of the sheet steel and nail to the side strip.

At the front, 2 inches from the bottom, attach the flat corner irons. Plug the tee with wood and bore a hole, cen-

tered for the 2½-inch stove bolt and washer. Insert a 2-inch nipple.

With the bottom up, assemble the legs. At each end of an 18-inch strip, secure the shorter side of a bracket, with 2 inches of the 10-inch side bent in at right angles. Note the position of a corner screw-hole for spring attachment with three links of chain. Center a snubber-block, 3 by 1½ inches high, to each leg piece. The rear legs are operated with a wire pull, run through the screw hole in a front iron and connected to the 3-inch corner iron set inside the snubber, as shown.

Cut hub-holes for inserting the wheel, then secure the chain supports with screw eyes set 8 inches from the top. Two

4-inch corner irons, two Ds, and wooden grips handle the top, as indicated. Groove each grip to clinch a D just inside an end screw.

Seven and one-half feet of rope will cinch half a side. Set a screw eye into an inside corner of the top, knot off a 3-foot rope-end, pass the other end through the screw eye and slit in the hem and out at the center of the side through a ring. Tie to the stem. For the cover, cut out a 4-inch leather disk, as shown, to center over the stem-nut.

Material List

Hardwood Stock

- 1 top-piece, ¾ by 4 by 32 inches
- 2 end-pieces, ¾ by 4 by 8 inches
- 2 strips, ¾ by 2 by 18 inches
- 4 strips, ¾ by 1½ by 21 inches
- 4 strips, ¾ by 1½ by 8 inches
- 2 strips, ¾ by 1½ by 28 inches

Hardware

- 6 feet black sheet steel, 28-gage, 28 inches wide
- 52 inches black oiled duck, 50 inches wide
- 1 square yard same duck or waterproof canvas for cover
- Front wheel, forks, and stem-nut
- 1 seat-clip (for top-bar attachment)
- 7 round head stove-bolts, 3-16-inch size (four 3-inch, one 2½-inch, two 1-inch)
- 1 pound flat head wire nails, ¾-inch
- 1 dozen wood screws, 1½-inch
- 2 spikes, 40d
- 1 machine bolt, ¾ by 4½ inches
- 2 straps for ¾-inch pipe
- 1 washer, ¾-inch
- 1 wire gate-hook, 3-inch
- 6 iron rings, 1¾-inch
- 4 narrow hinge-butts, 3-inch
- 1 dozen screw eyes, 2-inch
- 6 corner-irons, 4-inch
- 1 corner-iron, 3-inch
- 1 flat corner-iron, 4-inch
- 2 door springs, ¼ by 16 inches
- 4 steel brackets, ¾ by 10 inches
- 7 feet No. 12 wire
- 7 feet jack chain, 1¾-inch link
- 30 feet rope, ¾-inch size
- 3 harness Ds, 2-inch

Black Gaspipe and Fittings, ¼-Inch Size

- 7 pipe-lengths, threaded (three 11½ inches, one each 9, 16, 24 and 27 inches)
- 9 nipples, (three 2 inches, two 5 inches, one each ¾, 1¾, 1¼ and 4 inches)
- 7 tees—1 cross—1 cap—3 elbows, 90-degree—1 elbow, 45-degree

Rivet this washer to the canvas, centered 15 inches from the edge to be the rear side. The cover is tied down with 12-inch corner ties and rings fastened 8 inches from the top of sides. When not in use, it may be rolled up.

Now for the bike gear. Shape a hardwood block, $1\frac{1}{2}$ by 3 inches wide, grooved to fit between the bars at the head, as shown. One inch from the head and about $1\frac{1}{2}$ inches from the top bar, bore a hole for a 2-inch nipple. On the Hiker side, ream out the hole for a tee-rim. Bend inch prongs of a 12-inch length of wire, to be set into the wood with the loop and gate-hook secured by the tee when in place. On the other side make a hook-hole. Curve the gate hook slightly and with the washer and cap secure the hook.

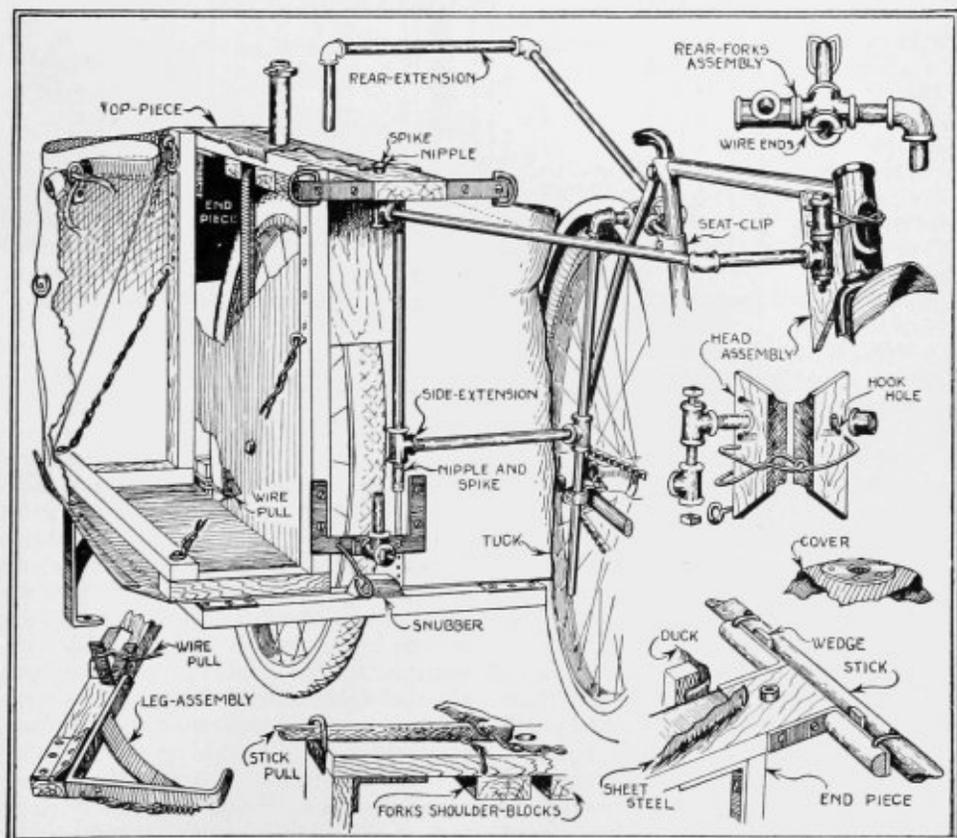
To rig the rear forks, connect an elbow, cross, and tee with $1\frac{3}{4}$ and $\frac{3}{4}$ -inch nipples, as shown. Into the 4-inch nipple of the cross, insert a doubled 18-

inch length of wire. Clinch the ends over the cross-rim, and plug with wood. Shape the extending loop to fasten to the seat post with the seat clip. To the elbow connect an $11\frac{1}{2}$ -inch pipe length, with a tee and 9-inch length adjusted and clipped about 2 inches from the hub nut. Pipe straps and short stove bolts make the double clip.

This rigging may be a part of the bike though quickly detached.

For the side extension, connect two $11\frac{1}{2}$ -inch pipe lengths and tee. Cut off 1 inch of a spike and insert the head and a 2-inch nipple into the tee. Make the spike connection and locate a half-inch hole in the top piece for a $1\frac{1}{4}$ -inch nipple, turned in to lie flush with the under side. Connect a tee, the 27-inch pipe length, 45-degree elbow, and a 5-inch nipple to the head, and a second spike completes this jiffy attachment.

The remaining piping and elbows make the rear extension.



NOVEL V. T. RHEOSTAT

Instead of the Customary Dial, This Homemade Instrument Has an Up-and-Down Slide Motion

by C. M. WILCOX

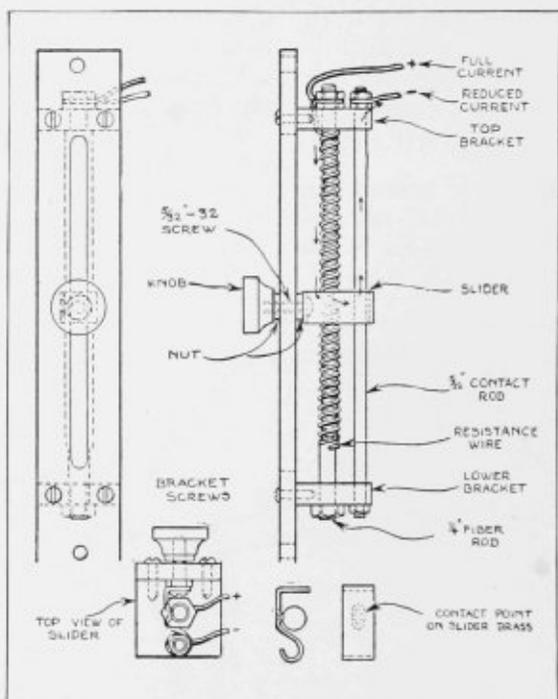
MANY radio amateurs who build their own apparatus wish to make their receiving set as original as possible. For such radio bugs this novel type of vacuum tube filament control rheostat may be of interest.

The general design is different in that the current is controlled by moving a slide up and down instead of by turning a knob as is the method employed in the common rotary type. One advantage of this rheostat is that it takes up less space than the ordinary type and therefore is more suitable for portable receivers where room is limited.

A strip of fiber or bakelite is used as a panel to which an upper and lower bracket is attached by means of small screws. The $\frac{1}{4}$ -inch fiber rod is grooved spirally by threading with a $\frac{1}{4}$ -inch die, 20 threads to the inch. A $\frac{5}{32}$ -inch brass rod serves as a contact rod and is held in place by terminal nuts, as is also the fiber rod. The resistance wire is attached to the fiber rod about $\frac{1}{2}$ inch from the bottom, wound spirally in the thread groove and terminated by soldering to the upper terminal nut. A brass strip is used to make the slider and is formed so as to provide a good frictional bearing on contact rod. The dented

portion on this slider forms a point of contact on the resistance wire which protrudes slightly above the top of the thread. A $\frac{5}{32}$ -inch screw is employed to hold the knob to the slider.

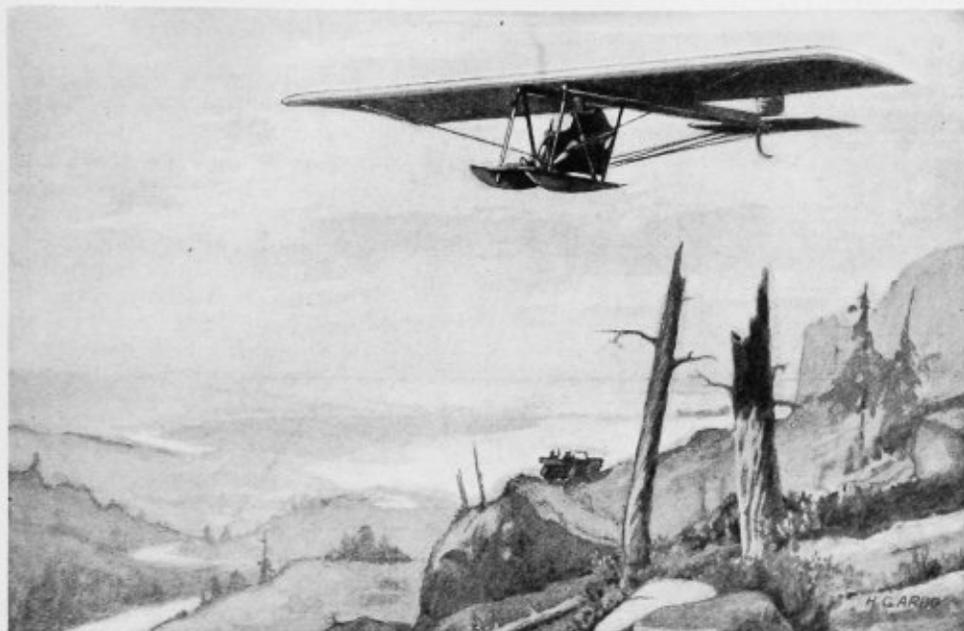
When the slider is at its lowest position, the current is broken; as it is moved upward, the resistance is lessened accordingly. Since the standard gage rheostat wire has a resistance of 1 ohm per foot, a coil $\frac{1}{4}$ inch in diameter and 4 inches long, having 20 turns to the inch, gives a resistance of about 5 ohms—equal to that of the common commercial types. The wire is easily procurable from radio mail-order houses and the



The Construction of This Novel Rheostat is Simple and Its Parts Are Easily Obtained

price asked is usually one cent per foot. As only about 5 feet are necessary, the cost of the wire for one rheostat will not be more than a nickel. Since there is one ohm of resistance for every .8 inch, the panel can be graduated thusly, the graduations being scratched on and filled with white or red ink. This gives a neat and finished appearance that harmonizes with the rest of the panel on any well-made receiver.

Experimentation is part of the joy associated with radio and therefore a rheostat of this kind is worth attempting.



HOW TO BUILD A SAILPLANE

For the Boy or Man Who Would Build a Practical Motorless Plane This Article Will Be of Magnetic Interest

by DONALD W. CLARK

THE success attained by recent experiments with motorless planes has greatly stimulated interest in this type of machine and the tendency in design is to approximate modern airplane construction, rather than the flimsy structures of other days. The sailplane here described carries out this idea.

It will be noted that the plane is of very simple cantilever design, with thick wing and tail-boom supports for the elevator and rudder.

To facilitate handling, the wing is built in three pieces, and only eight bolts are required for assembling. There are no brace wires exposed and the control cables are as few as possible. The span is 22 feet 6 inches and the chord 5 feet. The over-all length is 15 feet 3 inches and the height 6 feet 6 inches. Complete and ready for flight, the plane should not exceed 75 pounds in weight.

As there are very few metal fittings and the wooden parts are simple, the amateur should have little difficulty in fabricating this ship. In building the

plane it is best to start with the center panel. By referring to the drawings, it will be noted that the wing beams are box type, built up with battens, ribs, and side webs.

The front beam measures 2 by 5 inches outside and is 10 feet long. The battens are $\frac{1}{2}$ by $1\frac{3}{4}$ inches by 10 feet and should be of spruce or white pine. The ribs are of the same stock, cut 4 inches long. Four reinforcement blocks are required to take the bolts used in assembling. Pine or whitewood should be used, size $1\frac{3}{4}$ by 2 by 4 inches.

The battens are nailed to the ends of these ribs and blocks, which are spaced as shown, forming a sort of ladder. The webs are $\frac{1}{8}$ inch thick, 5 inches wide and 10 feet long. If possible they should be of basswood or white pine, glued and nailed to each side of the ladder structure, thus forming a rigid box spar. The rear beam is built up the same as the front, but is only 4 inches wide. Ribs and blocks are spaced the same, but they are only 3 inches long.

The wing ribs are of the section shown in the drawing. They are built up of battens $3/16$ by $1/2$ inch and blocks $1/4$ by

have compression bars placed as shown on the drawings.

In assembling, slip the ribs on the beams in their proper order and spacing and nail in place. Then fit the filler blocks at points where bolt holes are to be drilled. These blocks should be glued and nailed. Four angle blocks are used in the corners, as shown, fitted to the beam and compression bar to brace them securely.

The space between the two center ribs is braced with $1/16$ -inch wire and small turnbuckles. Small metal plates are bolted to the beams to take the wire ends. The leading edge is spruce or

1 inch of various lengths as required by the curve. Special blocks are used at the nose and tail of the rib, with notches to take the leading and trailing edges. The battens are glued and nailed to the ends of these blocks or ribs. Special tapered filler blocks are needed at the top of the beam spaces.

It is easiest to use a form in assembling the wing ribs. A board $3/4$ by 8 inches by 6 feet can be used as a base. On this draw out the contour of the wing section and the location of the ribs. Then nail down small blocks, about 1 inch square, so that the battens may be slipped between them. Insert the rib blocks, previously cut, and nail to the battens. The completed rib may then be slipped off the form and the next one assembled in the same manner. This method will insure uniform shape of ribs.

Six ribs are required for the center panel. Two of them must have battens 1 inch wide. These ribs are used on the ends of the panel and are made stronger to resist the pull of the cloth covering.

These two ribs and the two center ones

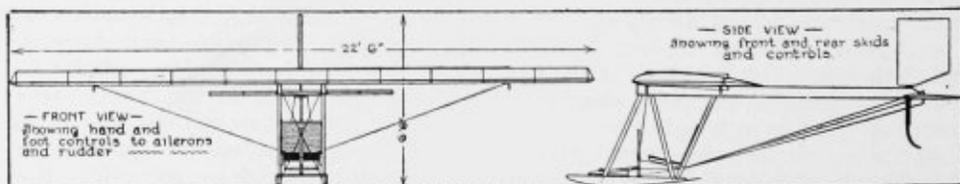
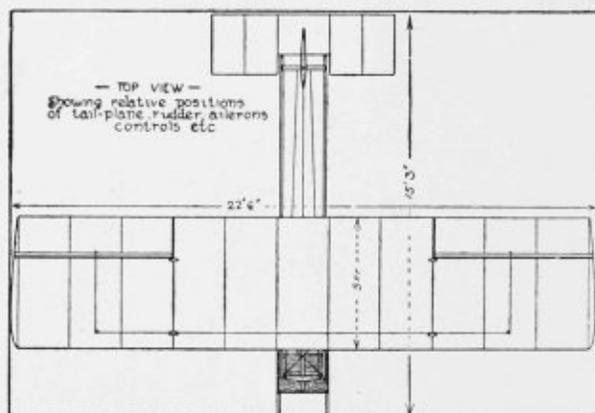
white pine $1/4$ by $1 1/2$ inches by 10 feet inserted in the notches and secured with glue and nails. The trailing edge is of the same stuff and fastened in the same manner.

Bolt holes are drilled in the beams at points 11 inches each side of the center and others $1 1/2$ inches from the ends. This completes the panel. It is now ready for covering.

The end wing panels are built up similar to the center panel. The beams are of the same cross section, but are only 6 feet long. To reduce weight the side webs are cut out as shown. Blocks are used where bolts are required. The wing ribs are the same as those for the center panel, but the battens are cut off flush with the face of the rear beams to allow for the ailerons.

Wide battens are used on the end ribs and compression bars are also needed here. Corner blocks are used for bracing. The leading edges are 6 feet long.

The two panels are built up alike, except that the placing of the fairing piece on the one end of each, as shown in the



Including the Illustration on Upper Part of Page, These Three Drawings Present the Top, Front and End Views of the Sailplane. The Drawings Are Made to Scale

drawing, makes one right and the other left, when connected to the center panel.

Bolt holes are drilled in the butt ends of the beams $1\frac{1}{2}$ inches from the ends. A hole is needed in the center of the front beam to take the aileron pulley bolt. Filler blocks are required at these points.

The end panels are secured to the center panel by plates $1/16$ by $3/4$ by 4 inches and $3/16$ -inch bolts made from drill rod. The ailerons are made from the tail ends of the ribs cut from the end panels. The beams are $1/2$ by $3\frac{1}{2}$ inches by 5 feet $11\frac{1}{2}$ inches. A fairing piece is placed along the front of the beam and secured with small angle blocks. Ailerons must be made right and left. In the center of the beams, reinforcement blocks are required to take the control yokes.

The trailing edges are the same as in the wings and are 5 feet $11\frac{1}{2}$ inches long. The ailerons are hinged to the wing beams with screw eyes and pins—two in the beam and one in the aileron at each point of attachment.

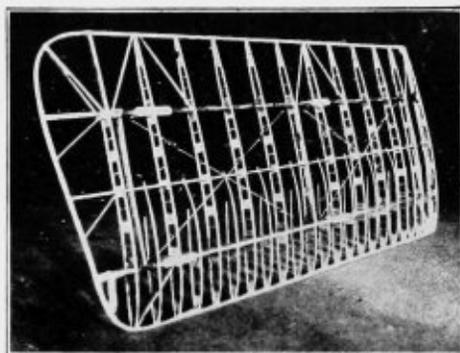
The yokes are made of 20-gage steel tubing, $1/2$ inch in diameter and are 9 inches long. They are inserted in the blocks and the ends flattened and drilled for the cable terminals. Four pulleys and clips are needed. Pulleys should be about 3 inches in diameter.

The elevator is hinged to the end of the tail booms with screw eyes. It is of one piece with one beam $3/4$ by $1\frac{1}{2}$ inches by 8 feet—spruce or pine. The ribs are of the same stock as the wing ribs and are 27 inches long. Leading and trailing edges are the same as in the wing and are 8 inches long. A block is used on the center of the beam for the control yoke, which is made of tubing like the aileron yokes, but is only 6 inches long.

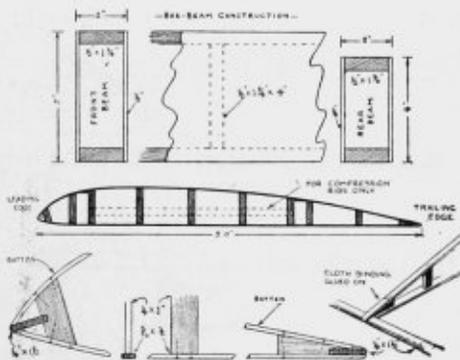
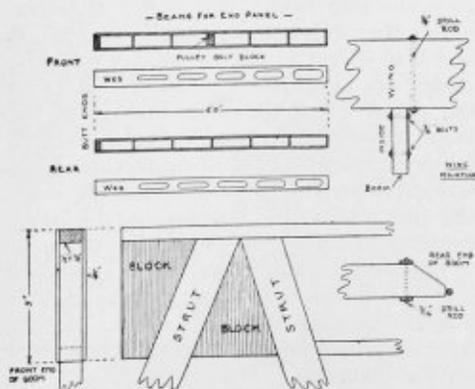
The rudder is built up of ribs slipped on a 20-gage steel tube $5/8$ inch in diameter by 4 feet long. Reference to the drawings will make this clear. The rudder yoke is a piece of ash or birch $1/2$ by 8 inches slipped on the tube as shown and secured with a round head wood screw.

The tail skid is made of a tapered piece of ash, steamed and bent to shape and bolted to the rudder tube. The tail booms are of box construction like the wing beams. They are $1\frac{1}{8}$ by 5 inches by 11 feet. The battens are $1/2$ by $7/8$ inches and the webs are $1/8$ inch thick and 5 feet wide.

Landing gear struts are inserted in the booms and made integral with them. Blocks are used at points where bolts are required. All joints should be secured with liquid glue and nails or screws. The

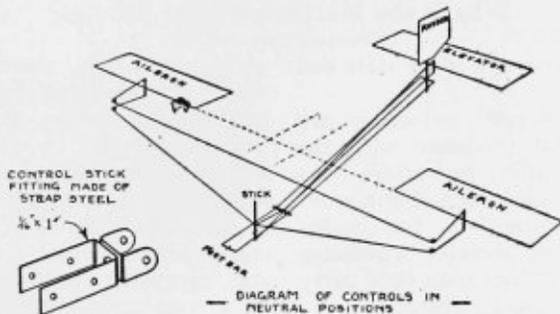


Showing General Assembly of Box Wing Construction



The aileron cables run from the upper fitting on the stick, out to the pulleys on the under wing surface and then to the yokes. The top aileron cable runs around the pulleys from yoke to yoke across the top of the wing.

In launching, the plane is towed by a loose end rope attached to the front end of the booms. With the pilot in his seat,



— DIAGRAM OF CONTROLS IN NEUTRAL POSITIONS —

the plane is pulled by several helpers preferably down a hillside and into the wind until it takes the air like a kite.

When the ship has risen into the air, the rope is released

and the rest depends entirely upon the skill of the pilot in handling the controls. When he becomes proficient enough to take advantage of the varying wind currents, long flights may be accomplished.

Mounting a Circular Saw in the Turning Lathe

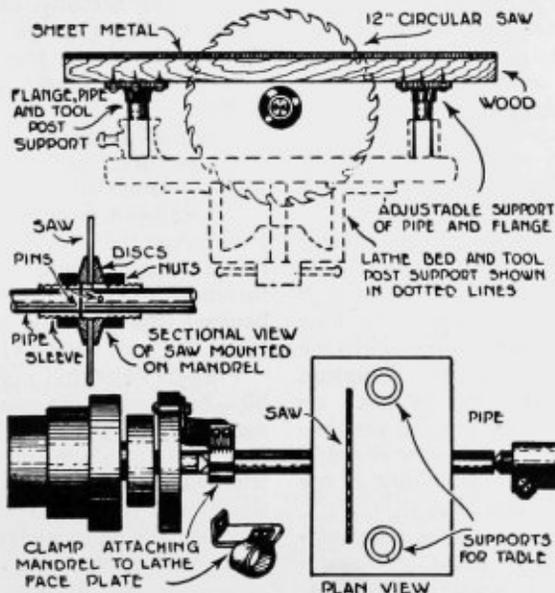
A MEANS of expediting the fitting, or cutting out, of the various shapes and sections of wood entering into the construction of many of the chests, cabinets, tables and other pieces of furniture common to the average job workshop will be found possible by the turning lathe attachment shown. In this attachment, a 12-inch circular saw is mounted on a mandrel swung between the lathe centers, but attached to the faceplate of the lathe.

A rigid mandrel is required to prevent springing, and either a solid bar or steel pipe is needed. The saw is fixed to this by the usual means of end disks. A clamp rig is made to fasten the mandrel to the faceplate. A flat plate of sheet iron mounted on a wood back-board is secured in place of the rest in the tool post,

and an extra support provided to rest on the rear surface of the lathe bed. The table is slotted for the saw rim, which protrudes an inch or more, depending upon the requirements of the work.

In use, the saw is driven at the highest possible speed that the driving pulley will permit. The use of the hand saw can almost be dispensed with through means of this attachment, as it is possible to guide the wood freely and quickly across the face of the speedily revolving saw,

cutting entirely through or to any required depth without any of the loss of time incidental to the slow and tedious process of holding the wood in the vise or on the trestle while pushing the hand saw across a marked line. For many similar cuts or widths it is possible to attach a guide to the table.



What's the Matter with the Movies?

(Continued from page 344)

feels it has been hoodwinked by stars and features.

As real stars and real productions are all the independent producer with the conscience has to offer, he suffers once again. Do you wonder, then, that a moving-picture actor whose hope for the future lies in his work of today repudiates an unfair contract rather than be a party to the ruination of good pictures?

That is why I have refused to work for picture butchers at \$7,000 a week on cut-and-dried program features, and have offered to return to work for twelve hundred and fifty dollars a week if a competent, conscientious director directs my work in worth-while features.

The trusts method of curtailing the independent producer's distribution is also very efficient. This is accomplished through its distributing mediums. Again we find its methods twofold. They sell complete programs, a trick by which the small exhibitor must show a whole year of their pictures in order to get any at all—and then he must take the whole program, just as it is turned out of the mills. The other method is to secure interest or ownership in theatres and permit them to show only trust pictures.

So it is not always the fault of the exhibitor who runs the theatre you patronize if the ordinary program pictures you see day in and day out are not up to your expectations. He is not to blame any more than is the artist who appears in the picture you take exception to. The poor exhibitor, in order to secure a few good pictures with real box-office value, is forced to sign the trust's entire output for the year. And so he must contract to rent eighty-two or more pictures, though he knows full well that some will be so impossible he will have to refrain from showing them and simply pocket his loss.

That is what is the matter with the movies—and that is why the American public spent only one half as much on pictures last year as they did the year before. And that is why they will spend even less next year, if something is not done to remedy the situation.

The American public wants good pictures and is entitled to them. The conscientious producers want to produce

good pictures and should be supported in doing it. The real artist-actor wants to give you the the best there is in him. In order to do this he must be allowed to act in high-grade pictures and take sufficient time to make them.

Art is the only weapon with which the conscientious producer and the artist, or star, can fight the commercialism of the trust producers. Naturally the trust wants to discredit art and lower the public's idea of what the standard of pictures should be. The lower the standards, the cheaper the pictures can be made; the lower the overhead, the more the profit.

Now you can understand why Rudolph Valentino is not making pictures. The merciless cutting of "Blood and Sand" threw me into grave doubts. My experience in "The Young Rajah" verified my fears. I realized that I was not going to be permitted to act in real pictures or give the necessary time and study to my work.

Art? What did that mean to the commercial producers. They wanted film—thousands of feet of film. And they wanted it quickly. The quicker the film was made the less the overhead, and the sooner the release.

So we hurried through. Night after night we worked—sometimes until daylight. We actually finished the picture August 10, at three in the morning. Apparently those producers were convinced that midnight oil is conducive to genius.

I'm not going to hurry through any more pictures, and I'm not going to be cast to parts that are unworthy a novice or a worn-out ham. Other movie actors have taken this stand. Some have fallen by the way. Some have emerged victorious—Mary Pickford, Douglas Fairbanks, Charlie Chaplin, the Talmage girls, and now comes Harold Lloyd.

Forget Valentino and his little squabble—but keep your eyes on the independent producers and on these stars. Compare their productions with those of the trust-controlled producers. Remember that your money is the deciding vote whether the independent producer prospers and gives you real pictures or

(Continued on page 426)



MRS. COHEN was very popular. Cohen was blindly in love, but jealous enough to find cause to write to young Isaac Levy as follows: "Dear Levy: You have been making love to my wife. Meet me in my office, 2 P. M., May 2nd. Cohen."

Levy replied: "Dear Cohen: Your circular letter received. I will be at the meeting you have called. Levy."

"MANCHURIA wants America's worn-out street-cars." We trust that this does not mean we are to lose all of our local street-cars.—*Asheville Times.*

FATHER (sternly to daughter)—"I see that you and your young man have gotten so far as sitting on the sofa together."

Daughter—"Yes—sofa so good."

KING TUTANKHAMEN at least can not complain that his coming-out party was neglected by the papers.—*New York Tribune.*

CITIZEN—"Your honor, I'm too sick to do jury duty; I've got a bad case of the itch."

Judge (to clerk)—"Scratch that man out."

THE most satisfactory substitute for coal is spring.—*Associated Editors (Chicago).*

THE class composition was on "kings," and this is what one boy wrote:

"The most powerful king on earth is Working; the laziest, Shir-king; the wittiest, Joking; the quietest, Thin-king; the thirstiest, Drin-king; the slyest, Win-king; and the noisiest, Tal-king."

HUGO STINNES says the Ruhr situation does not call for talk. He is right. It calls for payment.—*Pittsburgh Gazette Times.*

HAVE YOU HEARD THIS ONE?

LITTLE GIRL (in theater)—"Mother, when do the Indians come in?"

Mother—"Why, there are no Indians in this show."

Girl—"Well then, who scalped all the men in the front row?"

AN Arkansas woman has cremated her third husband. It seems unfair that some should be old maids while others have husbands to burn.—*Orange (Texas) Leader.*

MOTHER—"No, Bobbie, absolutely no. For the third time I tell you that you cannot have another chocolate."

Bobbie (in despair)—"Oh gee, I don't see where Dad gets the idea that you're always changing your mind."

WHY doesn't France threaten Germany with prohibition unless she pays up?—*New York Tribune.*

THE goose had been carved, and everybody had tasted it. It was excellent. The negro minister, who was the guest of honor, could not restrain his enthusiasm.

"That's as fine a goose as I ever set mah teeth in, Brudder Williams," he said to his host. "Whar did you get such a fine goose?"

"Well, now parson," replied the carver of the goose, exhibiting great dignity and reluctance, "when you preaches a 'speshul' good sermon, I never axes you whar you got it. I hopes you will show the same consideration."

THE next time we have a war, let's shop around and see if we cannot find a cheaper one.—*Vancouver Sun.*

BIX—So your friend became wealthy through a sudden upward movement in oil? What stock did he buy?"

Dix—"He didn't buy any. A rich old aunt tried to start a fire with a can of it."

THE Denver seer's discovery that Henry Ford is the reincarnation of Tutankhamen explains why the old king's chariot is still in running order.—*Norfolk Virginian-Pilot.*

HE—"I offer you my heart's first fresh young affections."

SHE—"George, I have often thought I'd like to teach—but I never cared for kindergarten work."

THE phrase "frozen credits" must have some sort of connection with the icy stare we get when we try to extend our note.—*Dallas Times-Herald.*

Valentino, the Man

(Continued from page 346)

and a world of handicaps. It's a strange reception this star is getting. The women worship him for what he isn't and the men refuse to admire him for what he is.

When Valentino sprang into fame in the "Four Horsemen," about 95 per cent of us thought him a fresh importation from Italy and we resented it. Probably most of us know better now—but there are a good many who do not.

Anyway, Valentino was not brought over here as a pampered star on silk cushions. His first appearance in the "movies" was as an extra at five dollars a day—and that after he had hung around the studios for weeks with the hopeless persistence that can only be born of actual want—sheer poverty. For he had spent many a penniless day in New York City and had already been initiated into the Central Park Chapter of the Lodge of Morpheus.

Valentino did not come over from Italy to enter the movies or to dance. He came here to be a farmer. He actually did work as under-gardener and as park laborer, too. He was in America four years before he ever saw the inside of a movie studio. Back in his early days in New York he had the choice of dancing or starving. He decided to dance—not for money but for his meals. His dancing career started at Maxim's. Soon he was giving private lessons to a few of the guests there, earning a little money each week. His next step toward a steady meal ticket was to hire himself out as partner to Bonnie Glass, a professional dancer. As her partner he appeared in the eastern vaudeville houses and cafes.

"I never liked dancing as a profession," explained Valentino. "I wanted to get away from it as quickly as I could. I wanted to be a farmer. I wanted to get out to California where so many natives of my own country had wonderful farms. So I joined the musical comedy, 'The Masked Model,' which was headed that way. And so began my theatrical career."

Dancing had pulled Valentino out of a bad hole once, and when he was in trouble again he naturally turned to it, especially as that was the only way of making an honest living left to him.

"The Masked Model" expired in Ogden, Utah, but Valentino succeeded in reaching Frisco—his Mecca. Now he would put to use the training he had received at the Royal Academy of Agriculture back in Italia, from which he graduated with the highest honors of his class.

Alas! Rudy made a startling discovery. They were not hiring expert agriculturists on the ranches and farms of California. However, they could use some good strong garden men.

So Rodolpho Guglielmi turned his saddened eyes toward the harsh glare of the footlights again. He did not set Jack Barrymore gnawing his finger nails or take Al Jolson's contract away from him. The lights of Broadway may have shone a little brighter when he appeared around Times Square, but nobody noticed it. Anyhow, we find him, a year later, with a bond house in San Francisco, competing with the Liberty Loan.

"But I couldn't sell a nickel's worth of my stuff," Rudy admits, "and so I guessed I'd better take Norman Kerry's advice and try the movies." He learned to pilot an airplane expecting to join the Royal Flying Corps, but defective vision in the left eye kept him out of the war. He figured his airplane experience would help him land a berth with a moving-picture outfit.

That is why he left big business cold and, at Frank Carson's suggestion, dropped over to see Al Jolson, who found an extra berth for him in his company's train. Thus Rudolph rode on to fame, if not to fortune.

The only reception committee awaiting Rudolph at Hollywood was a studio door-keeper. "And a hard-boiled egg, he was," confides the ex-agricultural expert.

But Rudy, thrilled with ambition—and threatened by his landlord—joined those who pitch their tents outside the walls of Hollywood and fought it out. "Fighting it out" had become a habit with Rudolph by this time.

In the six months that followed Valentino just hung about the studios doing "extras" at five dollars a day—some days.

(Continued on page 428)

TRELLAGE WORK

by E. A. McCANN

TRELLAGE work is different from trellis, in that it is on the square, instead of being diagonal. It is a little more trouble to make but the result is much more refined and pleasing to look at. A simple arch or series of arches joined to form a pergola is shown in Fig. 1. The dimensions for such an arch are given in Fig. 2.

The uprights and heavier crosspieces should be of $1\frac{1}{2}$ -inch or 2-inch square wood, the crosspieces being stump-tenoned into the uprights and the top bars half-lapped together where they meet the uprights and nailed through. The trellage work would be $\frac{3}{4}$ square wood half-lapped together and stump-tenoned to the heavier wood or just nailed. The uprights should be driven at least 18 inches into the ground.

To make a pergola of it, make a series of arches, placed any desired distance apart, but make the top bar *A* continuous, any necessary joints coming on top of a post the lattice as at *B* may be continued right along or just the top ornamentation as at *C*.

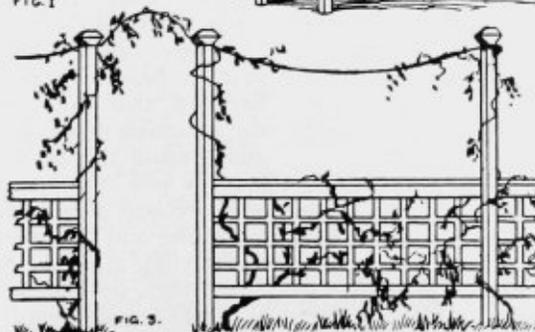
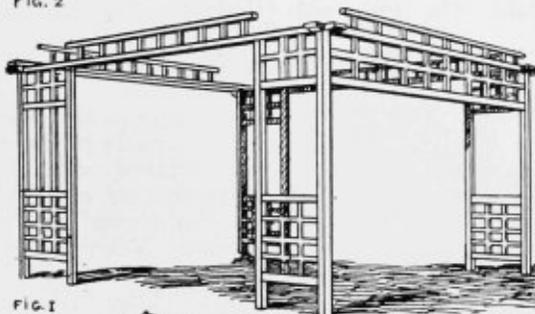
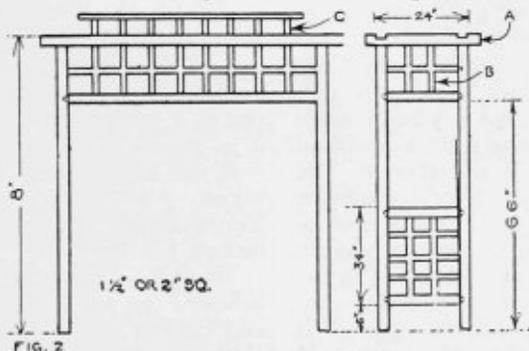
For the trellage work, cut all your pieces the right length, lay them together and mark off and saw them while side by side, chipping the pieces out with a chisel.

This kind of work lends itself well to porch fronts, doorway porches, gates, summerhouses, rose-bowers, wellheads, or fences.

An attractive design for a light fence is shown in Fig. 3. The uprights should be of 2-inch square wood, the caps being two

pieces of the wood 4-inches square beveled and nailed on top, or can be a square cap, with $\frac{3}{4}$ -inch molding nailed underneath. The top of the posts forming an entrance are joined with a bent iron bar, and a light chain between the posts as shown looks well. As this has to stand flat, without side support, the joints should be well and strongly made and the posts sunk firmly in the ground.

Trellage summerhouses, pergolas or fences constructed by these methods are a distinct improvement to the grounds upon which they stand. The structures should always be given several coats of paint.



Ornamental Structures for the Garden, Lawn or Conservatory Can Be Built to Add to the Beauty of the Flowers and Foliage

What's the Matter with the Movies

(Continued from page 422)

whether the trust monopolizes the entire industry and feeds you what profits it best. You are to be the judge. I know what your verdict will be.

I have been asked why the producers so mercilessly hacked "Blood and Sand." When the film was completed it went to the business office. It was measured. It was too long—the most heinous offense known to the trust—a full six hundred feet too long. Its extra length meant a little less profit. So into the butchering rooms it went.

Of course certain parts of it could be re-acted and condensed and thus keep the continuity clear. But that meant more time, more money and less profit.

So clip, clip, clip. And the very heart of the film was cut out. How much that saved I do not know, but it saved money. What if the public was a little confused and disappointed here and there? The picture would get by. Everybody knew it was good. Why quibble about a scene or two? As a matter of fact the picture was a lot stronger than it needed to be. And making pictures too good was simply piling up trouble for the future. It was spoiling the public. The better you

give them the better they want. The thing to do was to standardize picture quality. Then they wouldn't always be demanding the world and all for the price of one admission.

With that philosophy in mind they made "The Young Rajah"—and I quit.

Maybe I'm temperamental because I refuse to caper through rot on the strength of what reputation I may have earned. But this I know—the "Rajah" picture was the first step down. After that the descent would have been steady—and not so slow, either.

Maybe it is unbusinesslike to repudiate a contract that involves you in producing films in which you cannot possibly give the public what it is paying for, and in a process of cheapening that would mark one as a puppet rather than an actor. If it is, then I'm unbusinesslike.

It just happens that I have ideals—and hopes. I am sorry I ever acted in "The Young Rajah." I will never act in another picture like it.

The public wants art in pictures and I believe I can put it there. Doug and Mary and Charlie and D. W. have done it and I'm going to try.

Something Bigger Than Profit

(Continued from page 352)

last cent she possessed. That's Mrs. Maurer all over.

She has taken it upon herself to champion the woman who must depend upon her own resources—and she is in the game till the final whistle blows. She is going to get that woman everything that's coming to her, or go down with her hand still to the plow. Once she starts out for a thing she's as resourceful as a sewing-machine salesman and as persistent as an engine knock. When it comes to stick—well; a burdock burr is slippery elm alongside Madame Marinello.

Take the case of insurance, for instance. No insurance company would at one time take the risk of a beauty shop. For several reasons, foremost among which was that the women in charge of them were not reliable. Mrs. Maurer thought it would be a great help to her associates if she could get insurance for Marinello shops. The insurance com-

panies agreed with her—it would be fine for the beauty parlor people, but not for the insurance company. So she tried them all without success. A few companies in the dim distant past had insured beauty parlors. Never again! The loss ratio on those risks was too terrible to think about. They were sorry, but beauty shops would never be insured.

It was with something to think about that the head of Marinello went back to her desk that day. She reviewed what the insurance people had told her. Beauty shops could not be insured because the women who ran them were not dependable; because they lacked sound business principles and because they shed responsibility like a duck's back sheds water. They were, in short, a bad risk, plus.

"With those facts before me," explains Mrs. Maurer, "I set about to find a way out. I knew absolutely that the women I trained were not guilty of the

charges made by the insurance companies—but I knew the owner of the average beauty shop was. And no doubt some of the women under our banner, those we did not personally train, were careless about such things. We would clean house first, train our workers to meet the reasonable demands of the insurance companies and then get our insurance."

That was a big program—but Marinello shops are now insured, after a three-year struggle by Mrs. Maurer, and at a rate one-third that hitherto charged businesses of that character. An insurance expert was called in as soon as Mrs. Maurer was satisfied that Marinello workers met all requirements and after a complete investigation he secured insurance.

Naturally, Marinello had to do some tall educating in some instances, but that system of self-education and self-betterment that had put so many unfortunate women on the road to success was equal to the demand.

To use the automobile expression, the job done in the Marinello school is "complete rebuilding, not merely patching."

"One of the first things I must teach women who have had unfortunate experiences is that adversity is generally a blessing in disguise. I drill and drum into them this thought: trouble and misfortune and adversity is the furnace of life—into that furnace goes all sorts of material. Out of it comes steel or dross. There is no dodging that furnace.

"Then we go on to explain that whether we come out high-tempered steel or plain dross depends upon ourselves. Frankly, the first part of our course is simply the plain lessons of health and psychology. This because the worst enemy the average woman has is fear—fear of her ability to keep going, fear of the future, fear of the handicaps that face her, fear of her own weakness.

"Health has much to do with fear. Train a woman to good health and you have the strangle hold on her worst enemy—fear. Then teach her constructive thought, teach her that the law of cause and effect is inevitable, that we can get just what we go after. Teach her that success can be built as surely as can a house or a barn, or anything else.

"When a woman begins to realize that

every good thought, every thought of confidence and success is a nail driven into the structure of success she is building, she is on the right road. When she realizes that every bad thought is a flaw in her timber, is a weakness in the lumber with which she hopes to build her future—then, and then only will she realize that she must banish thoughts of failure, of fear, of evil, of worry and substitute for them thoughts of health, of success, of gladness and of justice.

"We will not permit them to pity themselves, no matter how hard their lot may be. Self-pity is the most weakening influence that can be brought to bear on a woman's backbone.

"After a woman gets to thinking right, it is an easy matter to mold cheer into her system, and cheer is the greatest asset success has. Cheer is the backbone of courage, for cheer is the big brother of optimism.

"It generally takes about a month to change a woman's viewpoint—and then we are ready to go on with the practical work of our profession. But all the while we keep drilling away at success thoughts and thoughts of happiness. The woman who is happy, who is confident of success and who is willing to work for it will gain it nine times out of ten. That's why we try to give a woman the right viewpoint first of all—because we realize that no matter how skilled an operator she may be in her profession, if she does not live the atmosphere of success she cannot succeed."

Mrs. Maurer ought to know, with fifteen thousand women under her banner and hundreds of successes torn from the very heart of failure. To accomplish this has required many things: a keen brain, a big heart and unlimited courage. So patient, so confident of final success, and so courageous has this business woman been in her work of helping others that when she could not find just the materials she wanted to train them to thoughts of success she wrote her own books—and did a mighty good job of it, too.

So, if Mrs. Maurer is a remarkable business woman she is infinitely more remarkable and successful as a teacher, for she realizes and makes others realize that there is "Something Bigger Than Profit."

Valentino, the Man

(Continued from page 424)

"What did you do as an extra?"

"Oh, what all extras do," replied Rudy. "Just stood around and got in the way and received more than my share of cussing. My name wasn't exactly an asset then."

"What did you average a week in those days? About twenty-five dollars?"

"Oh, my Lord! Twenty-five dollars? I'd have thought I was a millionaire if I averaged twenty. Fifteen dollars a week would have spelled opulence to me. I'd probably have bought an automobile on ten dollars a week."

"You know I did buy one as soon as I got steady work. I was making all of fifty a week. So I bought me a nice big four-cylinder speed buss for \$900. That wasn't much for original cost, but as a monthly upkeep I found it a little high."

"Did you have any out-of-the-ordinary experiences with famous directors of big stars that would make good reading?"

"Not in those days. I wasn't dining out much at that time. But I did have a lot of out-of-the-ordinary experiences with doormen, property men and under-directors that would not make good reading."

"Did you make any enemies?"

"Yes—Wally Reid's saxophone. Wallace Reid was a wonderful fellow—but that saxophone did get him up at the queerest hours. I never could figure when Wally slept. He swore my cutout kept him up one half the night and I know his saxophone kept him up the other. And *he* had a steady job daytimes."

It was in July, 1917, that Valentino first entered the movies. He was an "extra" in "Alimony."

His first real part was when he played the "heavy" in the "Married Virgin" at fifty dollars a week.

"At last," thought Valentino, "I have a chance. When they see my work in the 'Married Virgin' I'll get a steady job—maybe a good contract."

And so he existed the next few months, in the expectation of the release of that picture. But Rudolph's usual luck was with him. A squabble of some sort developed and the picture was not released. It was held for three years, and then fostered off on the public under his name

after he had gained national recognition.

He was paid three hundred and fifty dollars a week when starred in "The Four Horsemen." Since then he has been offered a contract at just twenty times that amount. He has refused it. He has refused it because the producers will not agree to produce the kind of pictures he thinks the public is entitled to.

Valentino is satisfied with "Blood and Sand" as it was made—though the best parts of it, according to him, were later cut out. Valentino is far from satisfied with "The Young Rajah" and has refused to act in any more pictures of that quality.

So it seems that at last the much harassed and almost hopeless public has a champion for better films—and that champion, if you can imagine such a thing, a star who is not staggering under the load of his wealth and yet who is willing to sacrifice his personal income to secure better pictures.

Peter B. Kyne says the motion-picture industry has nothing in common with art, or literature or even entertainment—but instead is merely a money-making proposition based on the adorable theory of as little as possible for as much as possible. And yet there is a young star with his future and his fortune yet to make who dares stand on his own feet and refuse an offer five times as large as any salary he ever before received unless art and conscientious effort are put into the film in which he is to be featured.

Valentino says "I refused an offer of seven thousand dollars a week to work on cut-and-dried program features hurried through in order to bring a maximum of cash for a minimum of art and effort and offered to go back with the same people at my old salary of twelve hundred and fifty a week if they would produce features of value, features that would permit me to give the public the sort of entertainment they expect from me." If this be true then we are talking about a man's man.

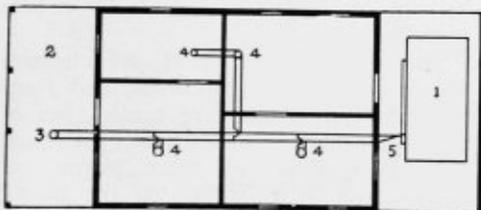
That's the Valentino I know—a modest, deadly earnest and decidedly likable young fellow with nerve enough to fight for what he thinks is right and backbone enough to stick it out.

The Motor Car as a Lighting Plant for Cottage

By L. W. McCLURE

THOUGH no power mains pass within miles of the place, a Lake Washington, Minnesota, man has rigged up a complete electric lighting system for his small summer cottage.

There are two requisites in his system: a simply wired cottage lighted by auto bulbs and an automobile equipped with generator and storage battery. A lean-to garage, at the rear of the cottage, although not indispensable, adds efficiency to the outfit. In this latter, a flexible cord, equipped with universal clips and attached to the main wires of the system, is suspended from the wall in such a way that to connect the lighting system to the auto is a task requiring but a few seconds. Directly after driving into the garage, the owner simply hooks the clips over the poles of the battery, which rests on the running board, just as the garageman does when he prepares to charge a battery.



Follow This Wiring Diagram When Installing the Wires

The idea has proved to be economical. Besides a half day's time the inventor has spent only the few dollars necessary for wiring materials and electric-light bulbs. He never pays to have his battery recharged, because he uses his automobile almost exclusively during the daytime—for pleasure riding and driving to and from business—and then the generator has a chance to store up electricity. This is the custom with many cottage dwellers who pass their evenings on the front porch or on the lake. In this way the system merely transfers the automobile light from the road to the cottage.

For one who wishes to employ this method of lighting but who is less economical in the use of auto lights, a

rectifier to charge the battery from the 110-volt alternating-current circuit at the city residence would prove a saving—especially where a “minimum current charge” is placed on the vacant home. One type of rectifier for “A” batteries—now widely used for radio work—costs fourteen dollars.

In order to make the system practical, certain directions concerning its installation and use should be followed. Since low voltage and poor wiring make a dangerous combination, all connections should be carefully wired and soldered. “Outside wiring” with good insulation is most satisfactory. For the main leads No. 12 wire should be used and if any appreciable distance separates the cottage and garage No. 10 wire should be used for connections between them.

Auto bulbs should be used for lights, and the number of these used should not be so large as to make a load heavier than that carried when the two headlights and the tail-light on the car are burning. (This totals about forty-seven candle power and can be divided up among twenty-one candle-power and five candle-power bulbs—the ordinary headlight and tail-light sizes.)

The battery should never be allowed to run down completely. It is a great help to back the bulbs with automobile light reflectors.

Protecting the Extra Spark Plug

THE spark plug that is allowed to roll around in the tool box is likely to be found with a broken porcelain when it is needed in an emergency. The wise motorist will provide some safe means of carrying the extra plug.

A piece of large garden hose makes an excellent means of safeguarding the extra plug. Place the plug inside of this and close both ends with large cork or rubber stoppers. Carried in such a way, the plug will be serviceable when needed.

Need a Tonic? Try Dr. Underfoot

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themselves the qualities that are necessary to our nutrition and our health. Animal life cannot exist without plant food—and our tonics and medicines and concentrated “nutritive” essences cannot take the place of the good old-fashioned “green herbs.”

We all know something of the value of cabbage, tomatoes, beans, carrots, corn, spinach and the like, and we have learned that wheat, barley, rice, oats and rye are very nourishing. Some of us even realize that dandelions and some kinds of seaweeds contain “tonics.”

What we do not realize is that practically every grass and weed that grows is food for us. Yes, even the tender shoots of shrubs and the leaves of trees can be used to advantage. We know something of the use of roots and of bark—but weeds and grasses—well, that's a little too much.

Of late the medical profession has found need to determine where it might look for the mysterious vitamins, for mineral salts and for roughage. What did the diet of the pellagra victim, the individual suffering from scurvy or the unfortunate afflicted with beriberi lack? Why did animals living on grasses and weeds not suffer from like diseases, while those that depended on flesh often did?

Experiments have been conducted over three or four years; experiments which proved that leaf foods—cabbage, sorrel, Swede and even alfalfa—contained the needed qualities and that a combination of cabbage, spinach, carrots, dandelions, milk-weed and “scurvy-grass” would prove a guarantee against such troubles.

Thistle leaves, hearts of bamboo and bamboo sprouts, wild mustard, half a dozen different seaweeds, marsh grasses, plantain grass, pigweed, clover and even the detested quack grass have been found to contain valuable nutritive qualities. In fact almost every grass that grows is food.

We have gradually learned to use the “greens” or tops of our root vegetables. Some of us can even appreciate the Chinaman's taste for young peas in the pod—especially if we have sampled them.

It is natural for us to be painfully ig-

norant regarding the wonderful foods that spread out before us on every hand. Our fathers were even more ignorant, and we are really blazing a trail man has ignored for centuries.

With instincts undulled by civilization, animals naturally turn to the green things of the earth when in need of tonic. Notice the sick dog or cat. What does it seek first? Water—and then grass.

Such is our own instinct too, but we kill it with a shot of medicine or bitters. Many and many a castaway or frontiersman's life has been saved by these modest grasses. How this occurs is described by Bachstrom in 1734.

“A sailor in the Greenland ships was so overrun and disabled with scurvy, that his companions put him into a boat and sent him on shore, leaving him there to perish. The poor wretch had quite lost the use of his limbs and could only crawl about the ground. This he found covered with a plant which he, continually grazing like a beast of the field, plucked with his teeth. In a short time he was by this means perfectly recovered.”

Science has recognized the curative powers of grasses and herbs, and from them most medicines are made. But in the process of manufacture the most valuable qualities of these plants are often lost. Thus it is that the plants themselves can accomplish what the medicines, or their extracts, cannot.

One of the things most lacking in the average American diet of today is bulk. Greens and vegetables are the perfect bulk foods. There is but one cure for constipation — bulk food. “Beauty,” says an expert, “is largely a matter of proper elimination, of keeping the system clean.” Nothing compares with greens and vegetables in accomplishing this. To the man who eats freely of greens there can be no such thing as constipation, or, for that matter, of indigestion, acidosis, scurvy, pellagra or any of a hundred other nutritional disorders.

“Strength and color is largely a matter of iron” say the exponents of iron-in-the-food diet. Raisins are rich to iron. Carrots, dandelions, spinach and the like are

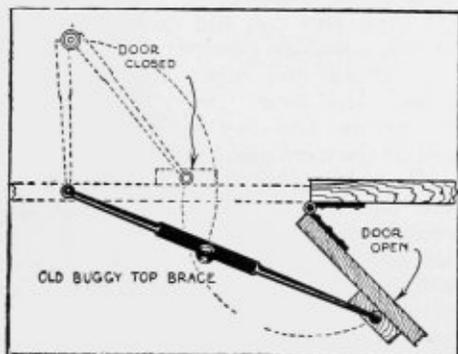
(Continued on page 432)

Prevent Injury to Car with Garage Door Fastener

Many a fine automobile has had its beauty marred by a garage door swinging against it when entering or being backed out of the garage. In fact, this is a very common accident and is apt to happen any time unless a simple and effective method is provided for holding the doors open.

A couple of braces from an old buggy top will do the trick nicely. One end of the brace should be fastened to the door near the top and the other end fastened to the door frame so that the brace will fold and pass inside the building when the door is closed.

When the doors are fully opened the brace passes over center and will remain in that position until again bent by some force applied from the side. A touch of the hand, or of a stick if the operator is rather short, will easily release the door.



This is a neat device and is positive in action. It can be picked up around almost any junk yard and fitted in a few minutes with the aid of a few tools.

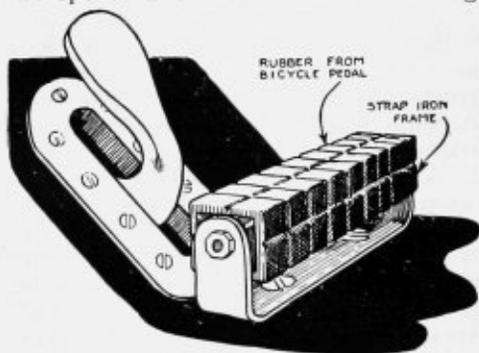
A Footrest for the Accelerator

Some of the modern automobiles equipped with a foot accelerator have a niche provided for the heel of the shoe, but in many cases the driver has nothing to hold his foot in place.

Part of an old bicycle pedal and a short length strap iron furnish material for a convenient footrest. The ends of the strap are bent up giving a space just equal to the length of the rubber pad from pedal between them. Drill and countersink two small holes in the base to fasten the frame to the floorboard of

the car and provide pivot holes in each end of the upturned strap. Fasten the rubber pad in place with the nuts saved from the pedal assembly.

The rest should be placed so that the instep of the shoe rests upon it when the toe is on the accelerator. The foot is pivoted on the rest and the throttle may be opened and closed without fluttering.



The foot rests easily and the driver is not tired by holding his foot in a certain position.

How to Make One Good Tire Out of Two Old Ones

An automobile tire casing that will run a good many hundred miles can be made from two old ones that are apparently beyond repair. All that is necessary for this stunt to be accomplished is to find two casings that are worn in the proper places. One must be worn well through the tread, while the other must be a casing that has rendered itself useless by reason of a rim cut. The proper combination of the two will prove valuable to any motor car owner.

Cut the casing with the rim cut so as to remove the entire bead from each side. This will leave a shell about an inch or more shallower than it was originally.

Now force this shell over the casing with the worn tread so the sides of the other one come down about even. This really puts one casing inside the other. Punch holes through the two casings about 6 inches apart and close to the edge of the outside one. Insert copper rivets through these holes, pushing them through from the inside, put the washer on and head over the rivet end on the outside. Cement a small piece of repair patch over each rivet head.

Need a Tonic? Try Dr. Underfoot

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ten times as rich in this quality and possess, as well, the vital vitamins of which the raisin is innocent.

"Vitality" we are told over and over again, "is drawn from vitamins." The commonest grasses you know are rich in vitamins.

"There can be no real health or beauty without good strong teeth—and teeth are dependent upon the mineral salts contained in the foods you eat." No foods compare with greens and vegetables as the producers of mineral salts.

"Most stomach disorders are due to hyperacidity—to too much acid and too little alkali in the system. More alkaline or base-forming foods are needed to balance the ration and protect us from the ravages of acidosis." The greatest of all base-forming foods are fresh vegetables.

"Purity and high nutritive value is largely a matter of freshness in foods" says a great food expert. What could be fresher than the greens we gather for each meal.

During the summer months we should not eat heavy foods but light bulky foods—rich in vitamins and mineral salts—foods easy to digest and possessed of little heat-giving qualities. That spells green vegetables, grasses and fruits.

Meat is by no means a perfect food. It is unbalanced, concentrated, incomplete and produces an excess of poisons within

the system. But it is flavorsome and we like it. We are going to continue eating it. We have no intention of becoming vegetarians.

What is needed then is something to offset it, to balance the ration in which meat is contained—to furnish the qualities lacking in flesh. Vegetables, green vegetables—especially the grasses and weeds—do this better than anything else.

Therefore it is easy to see about fifty reasons why we should eat the "green herbs" of which the Bible speaks. We can add another. They are the cheapest foods known to man. Most of them you can have for the cutting—sorrel, dandelions, wild spinach, beet tops, thistles, plantain leaves, pigweed, watercress, alfalfa, clover, milkweed, dulce, kale, wild mustard, "sauerkraut" and the hundred plants you've eaten as children. Could anything be cheaper?

To this free diet add cabbage, lettuce, carrots, tomatoes, potatoes, onions, beans, peas, chard and other common vegetables. Use them freely, especially the wild greens, and they will offset the ravages of the meat diet.

If you put your case in the hands of your doctor underfoot—the greens and weeds of the field—this summer you will feel and look better than you ever felt or looked before—and you'll save a lot of money.

Rainmaking and Fog Dispersing to Your Order

(Continued from page 366)

produce a light precipitation. But they haven't really attacked the rain clouds yet—for a very good reason.

The black nimbus clouds represent one of the great active forces of nature. They are highly charged with electricity. It is necessary to devise insulating apparatus before an aviator can safely venture among them with his own highly charged electrical apparatus.

Then suppose the attack was more successful than anticipated. The first result might be a cloud-burst. For this reason Dr. Warren plans to make the first real rain-making trials out over the Atlantic Ocean. These tests will probably be held early this summer.

Dr. R. B. Moore, Chief Chemist of the

United States Bureau of Mines, who has assisted the inventors from time to time says: "Remarkable results have already been obtained. When better apparatus is designed still more important developments may be expected."

Now what is the scientific theory back of it all?

Here is the idea that has been in Dr. Warren's mind for a good many years—in fact ever since he used to run a cattle ranch in the San Joaquin Valley of California and frequently had the cruel experience of watching the clouds pass over his parched acres without contributing a drop.

Each minute drop of water or vapor that helps to form a cloud bears an elec-

tric charge. Sometimes it is a positive charge, again it may be negative. But all drops in the cloud bear the same kind of charge. Now it is a well-known fact, of course, that like charges of electricity on two movable bodies near at hand cause them to repel each other. So these charged drops in finely divided form float around in the air, each independent of the others, and none heavy enough to fall to the earth.

Dr. Warren's idea was to get among these drops and take the electric charges off. He figured that the fine drops would then come together into large drops and precipitate. If sand bearing a positive charge, for instance, should be brought into contact with water drops bearing a negative charge, they ought to attract each other instead of repel, Dr. Warren and other scientists thought.

Experiments have proved that this theory is correct and the fortunate part about it is that when this coalescing or get-together process starts at the top of a cloud it gathers impetus as it goes down through the cloud. So that a very little sand produces a very great effect.

The apparatus in use now consists simply of a receptacle behind the pilot, in the airplane, for holding the sand and a protected metal spout projecting about a foot through the bottom of the plane. A valve connected by a wire within the pilot's reach controls the flow of sand from the box. The rush of air from the propellers is sufficient to scatter the 150-mesh sand over a wide, fan-shaped area.

A powerful, wind-driven generator attached to the plane furnishes the current. It is delivered to the metal spout and the grains of sand are electrified by contact as they leave the spout. In the Dayton experiments 10,000 to 15,000 volts were used, but in future experiments it is planned to increase this voltage to 30,000 or 40,000.

Sand is discharged at the rate of about thirty-five pounds per minute and at ordinary flying rates this would cover a strip at least a mile long. A Martin bombing plane can easily carry a ton of sand. Dr. Moore suggests, too, the possibility of using powdered talc instead of sand. This would give many times the number of separate particles per pound of even the finest sand.

Long wire antennae, trailing from the plane and insulated from it, are to be tried also in the near future. Perhaps discharges from these trailing wires may prove as effective as sand.

When a pilot has risen above and over a cloud and is about to begin his attack, the first thing to determine is whether the cloud is charged with positive electricity or negative. This he determines by trial. If when he releases the sand it makes no perceptible valley in the cloud, he knows he has the wrong kind of charge. He simply reverses a switch on his generator and the sand goes out with the opposite kind of charge on each particle.

The Government Air Service is particularly interested in this device at this time as a means of clearing fog from flying fields. Heavy fogs over flying fields have frequently caused the death of flyers who were unable to make safe landings.

Flying schedules are seriously upset by interference of fog either at the time of take-off or of landing.

The best way to clear a flying field, Dr. Warren thinks, is to use a captive balloon to carry the sand, in place of the usual plane. By using a cable a thousand feet or so in length and attaching the balloon to a small tractor on the field, the balloon could be towed around over the field until the fog blanket was completely dispelled. The electric generator could be attached to the tractor and the sand-controls also operated from the ground.

Dr. G. Cottrell, formerly chief of the Bureau of Mines, and inventor of an electric precipitator widely used to condense vapors and throw down dust in manufacturing processes, is much interested in the experiments of Dr. Warren and Professor Bancroft and sees no reason why they should not develop valuable and practical applications for the solution of many troublesome present-day problems of the air.

One of these days you may find yourself casually calling up rainplane headquarters and giving directions to have a light shower or a soaking rain delivered at some specified time and place or, vice versa, giving directions to have all wandering rain and fog clouds kept away.

What Keeps Most of Us Straight?

(Continued from page 361)

of readers an author must make the hero the kind of a fellow that the reader would instantly adopt for the time being as himself.

"Most people," said Mr. Hoffman, "are moral to the extent of preferring good to bad—when they have nothing at stake. They side with the hero against the villain."

One is tempted to wonder if Mr. Hoffman didn't go to the heart of the whole thing: We are good or bad according to whether or not we have anything at stake. If it makes no difference to our own fortunes one way or another we side with the good and look with disfavor upon those who take the opposite view. But if we have something at stake—ah, what do we do then?

In a moving picture show a melodramatic film was being run off. The hero—trusting, innocent and blind to what was going on, as movie heroes usually are—was about to be robbed of the papers that always are so important. Suddenly an excited voice rang out from the audience: "Watch out, mister! That bird's going to lift your wallet."

"Well, I'll be hanged," ejaculated a police detective. "The fellow who yelled that warning is 'Slippery' Riley, one of the cleverest pickpockets in the business."

In a middle western city several years ago a criminal, a cold-blooded rascal who had several murders to his discredit, was sentenced to the gallows. The reporters found material for a good story in the fact that the condemned man was interestedly following the fortunes of a fiction crook in a magazine. The bad man of fiction was a far more admirable character than the bad man who was facing the scaffold. The pen-and-ink villain did not double-cross his pals, or kill from behind or violate the ethics of a "square crook." You would have thought the flesh-and-blood villain would have been for him. But was he?

At the eleventh hour the governor granted the condemned man a reprieve. "That's good," exclaimed the bad man when the news was broken to him. "Now I can see that blankety blank in the magazine get his!"

Are either of these incidents in any way an argument in favor of the theory that the good in us outweighs the bad? Or do they bear out the theory that we prefer good to bad if we have nothing at stake?

There is plenty of evidence to show that the fear of punishment keeps many of us straight. That is instinctive once we know that punishment exists. Even a youngster, dared to do something he believes is wrong, is stopped by that belief. "I'd do it in a minute," he says, "but if my daddy ever found it out he'd skin me alive." There are many things we grown-ups would do if some form of "skinning alive" did not stare us in the face as a penalty.

What keeps the most of us straight, anyhow?

A Huge Thermometer

Some time ago the subdirector of the international bureau of weights and measures at Paris made a contrivance that registers the vertical expansion and contraction of the Eiffel Tower. To a stake at the foot of the tower the official fastened a wire made of iron and nickel, and incapable of expansion or shrinkage. He attached the other end of the wire to the lever of a register on the second platform, about three hundred and eighty feet above the ground.

The charts from the register show that the great tower is extremely susceptible to the slightest change in temperature. Although the greatest variation in the height of the tower amounts to only a little over two and one-half inches, the records of the register show that a passing cloud, a sudden burst of sunshine, or a heavy shower, exert a marked effect upon the height of the structure.

The members of the geographical service of the army have also studied the horizontal movements of the 7,000-ton tower. They find that even in a ninety-mile gale the oscillations of the summit amount to scarcely four inches. It would be interesting to apply this thermometer method to any steel bridge that has an unusually long span. The shrinkage and expansion could thus be recorded.

Let the Wind Saw the Wood

by H. H. SIEGELE

PERHAPS one of the oldest utilized powers in existence today is the wind power. It has been used for various purposes centuries before steam power was discovered. At the present time its use is almost entirely confined to pumping water. Occasionally it is used to run a churn or washing machine, but it can also be made to saw the wood for you, while you split wood.

A general view of the scheme is shown in Fig. 1. In Fig. 3 is shown the buck in detail. The legs of the buck are made of gas pipe, which are inserted into holes bored into the 8x8 inch timber for the purpose. The legs are securely fastened to a cement base in order to keep the buck from shaking. The rollers are fastened to the buck by means of lag screws, washers and pieces of gas pipe. The pipes are cut $\frac{3}{4}$ inch longer than the rollers. The lag screws should be about $\frac{5}{8}$ inch thick and about 7 inches longer than the rollers.

Bore holes into the timber where the rollers are to be fastened, using a bit $\frac{1}{8}$ inch smaller than the screws. First slip a large washer onto the lag screw, next the gas pipe, then the roller and lastly three washers. The holes of these washers must be large enough to slip over the gas pipe. This will permit play between the timber and the roller. Screw the lag screw into the wood until the gas pipe is held firmly and the roller can freely revolve on it. The roller with the crank can be one of the first or one of the second pair of rollers, whichever suits

the operator. This roller is studded with spikes which pull the log forward as the roller is turned.

The length of the stroke of the saw can be governed by the length of the downward arm of the bracket—the longer the arm, the longer the stroke will be. By referring to Fig. 1 it can be seen how

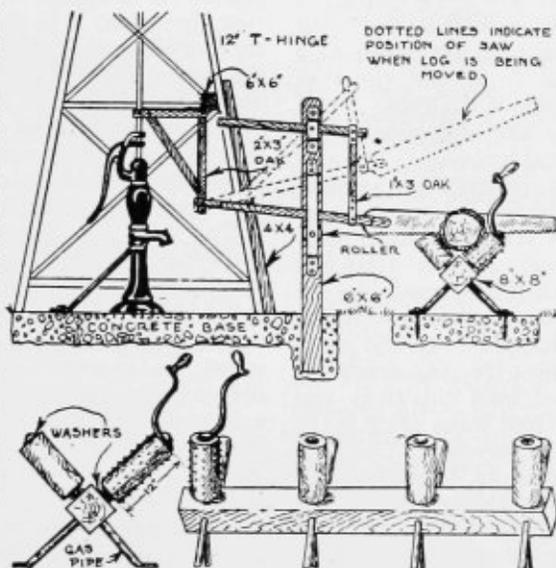
this is done. The dotted lines indicate the position of the saw while the log is being moved forward. The little roller on the guidepost Fig. 1, prevents the saw from dropping to the ground when the log is cut in two.

The whole scheme is very simple and inexpensive. A little study of the accompanying illustration will make it possible for any one who is handy with

tools to make the whole outfit himself. The very simplicity of the thing will make him wonder why he did not think of doing it long ago.

Vinegar Cleans Paint Brushes

Most formulas for cleaning hard, dry paint brushes require more time than one cares to give to a task of this kind. If one is in a hurry to do a job of painting around the home, the boiling of the brush in vinegar will probably remove the old paint quicker than anything else. Simply pour a cup of vinegar into a tin can (enough to cover the bristles of the brush) and place it on the stove. In a short time the bristles will soften in an astonishing manner and the paint can be worked out on a board or wiped out with a cloth.



White Wolf of Three Buttes Meets a Strange Fate

(Continued from page 411)

pulled his lariat from its peg on the wall, grabbed his hat and rushed from the cabin.

"I'll show you!" he yelled, as he ran for the mysterious shed.

When he jerked open the door, the faint outlines of what appeared to be a motorcycle could be dimly distinguished as he leaped upon it and jammed his one foot downward to start the mechanism. With a loud roar and a puff of blue smoke there hurtled from the building a strange-looking creation that flew past the astonished men with the speed of a zooming airplane. In a vast cloud of dust, Jay whirled out of the gate.

As it sped away, the men tried to examine its mechanical make-up. It was a conglomeration of motorcycle, automobile and horse. The saddle on which Jay rode was standard Western with a pommel but with stirrups cut away. His feet rested on a small platform, much like the floorboards of an automobile, the motor of which was under the seat. To make easy movements possible, the frame of the motorcycle had been cut away and brought up to the front forks much in the manner of women's bicycles. The tires of the wheels had been thickened and looked like motor-car shoes.

Jay guided his machine toward the Three Buttes. He knew from the previous raids of the wolf that he would be likely to pick up the trail there. As he sped over White Bear Flats the detonations of his roaring motor echoed vibrantly in the distance. As he drew closer to Milk River, his eye caught sight of a small bunch of cattle milling about in a fashion that attracted his attention. He knew from long experience that only some unusual thing could cause such a commotion. He opened the throttle and fairly jumped in the direction of the cattle.

He was a half mile from the churning cattle before he was able to see distinctly what was happening. Between the cattle a white object was darting and leaping, and now the bawling of the frightened cattle reached his ears. He realized that by unexpected luck he had come upon the quarry he sought then above all things. It was the white wolf!

Caught by surprise, the wolf suddenly abandoned the young heifer which he had just dragged down and, standing stiffly, inspected for a fleeting second the roaring thing that was rushing toward him. The movement of Jay reaching for his lariat rope, back of the saddle, broke the spell and the white wolf took to his heels, the iron pursuer after him.

Here was a rare race. The animal, wild with fear, went across the rolling prairie like a streak. After it like an arrow shot from a powerful bow whizzed the pursuing Jay. The loud exhaust of the motor was rasping the wolf's nerves for now and then he turned his head to flash a malign glare at the shooting thing that was surely coming upon him. Jay prepared to whirl his lariat, while with one hand he guided his machine.

The wolf was weakening, froth was flickering from his gaping jaws and his tongue was lolling. Shakily he began to falter. This was the sign Jay had been waiting for. With a sudden burst of speed, he swung his loop and let fly. Never in any roping contest had he made a more perfect cast. The loop went true, falling with a hiss over the wolf's body.

Jay applied the brake and giving the lariat a quick jerk to gather the slack, he took several rope-turns about the saddle horn. Wheeling about he brought the wolf with a terrific shock to the ground. In that instant, Jay pulled his gun. A sharp report and the marauder's career was ended. He stopped, picked up the carcass and loaded it on his machine, tying it with his rope.

A half hour later he rolled into the ranch yard. The men had heard him coming. They were waiting. At the sight of the white bundle on the back of Jay's mount, they were for a moment speechless.

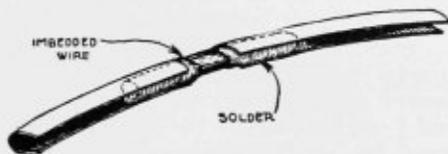
Jay loosened the carcass and flung it upon the ground. "Well," said he, "there's your ghost, boys."

They all looked at it agape.

"Only goes to show," interjected Jay into the silence, "that with modern science, mechanism and the necessary man's gumption to tackle things that there ain't nuthin' on this earth called impossible but what *can* be done."

First Aid for Broken Umbrella Rib by Soldering

He who has a soldering outfit need not wait for an umbrella mender to repair his rainy-day protector when a rib breaks, if the rib is of the modern U-bar type. A length of stiff, springy wire laid in the channel of the rib and soldered into place will do the trick. It will be well to shorten the rib a trifle, so that the solder may adhere to the wire and rib all around the break. Care must be taken to make the mended rib neither shorter nor longer than its mates or trouble will be encountered when the umbrella is closed. A

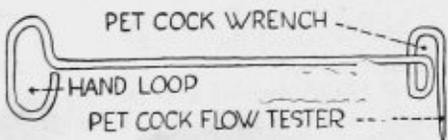


A Piece of Spring Wire Should Be Fitted in the Channel

thorough cleaning of the rib preparatory to soldering is essential—otherwise the japan on the metal will make soldering a very hard matter.

Double Pet Cock Tool

The pet cocks for the testing of the oil levels of the most popular light car are in a rather inaccessible position—comfort and cleanliness of the operator being considered. Any method of making it easier to operate them is always welcome. Such a device can be made by almost anyone in a few moments, the material used being a single length of fairly heavy wire, which is formed to the shape shown in



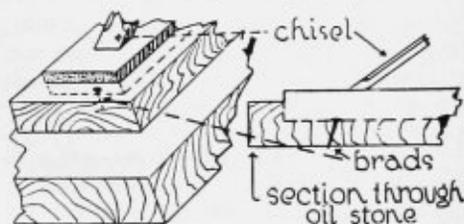
A Piece of Heavy Gage Wire Is All that Is Required

the sketch. The length of the finished article should be about thirty inches.

With a tool of this sort it is not necessary to get down on one's knees to turn a pet cock which is coated with oil and grime. The long handle and wire point spares your clothes and makes the reaching easy.

Grips for the Oilstone Casing Prevent Slipping

The attached sketch shows a simple method which we have found of advantage in steadying the oilstone on the bench while sharpening chisels, knives

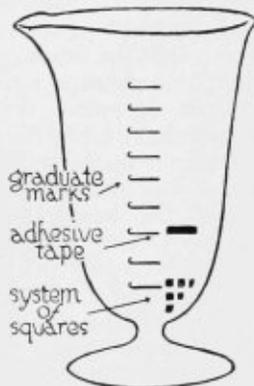


The Brads Should Project Only Slightly

and other cutting tools. Two small brads are driven through the bottom of the case, with length enough to have the points protrude 1/32 of an inch. This does not interfere with ready removal of the stone for placing in the tool box.

Aid to Accurate Measuring

It is a difficult matter to pour a correct quantity of fluid into a graduated glass where the light is poor or where the person using the glass has weak sight. Particularly where an exact dose of medicine is required, an aid to correct measurement is desirable. A narrow strip of adhesive tape set on the proper point on the scale will provide a fine mark by which to gage the dose. If the glass is to be used for several kinds of fluids alternately, an equal number of strips may be employed. Each fluid container is to be numbered and the strips numbered in duplicate. One, two, or more small squares of tape may be used on containers and glass, instead of the numbered strips.



Graduate Easily Read

The time saving element of this idea is helpful and the ease which it adds to reading is remarkable.

The Most Valuable Thing in the World

(Continued from page 360)

brain has served its apprenticeship to you. Now it must teach you the apprenticeship to your profession.

"Consider the lawyer. When he comes out of college does he expect to be retained at a large fee or to draw a fabulous salary with a law concern? He does not. He expects to work two or three years at a most modest wage, for practically nothing at first, until he wins his spurs.

"So it is in other professions, and so it must be in business. You must start at the bottom, and depend upon your trained brain to carry you up to the very top.

"This may seem hard; but remember that the college graduate does not have to serve the apprenticeship for his brain, too. That was served in college.

"To compete with the college-trained worker those without college training must train their own brains. And they must do it under unfavorable conditions—for they must earn their living as they do it.

"In the case of the man worker this is difficult. With the woman worker it is much more so—for there are not as many steps upward open to women as to men. Untrained women hold positions of limited possibilities. Consequently it is extremely difficult for them to train themselves as they would be trained in college. Yet they must be trained in order to compete in the great scramble that is today's survival of the fittest.

"The handicaps against the untrained woman are indeed severe. Inasmuch as your brain *must* be trained, is it not better to train it in the most fitting and pleasant environment of the college, instead of under the handicaps of the working world?

"That is why I strongly urge young women to get a college training—because it is so difficult for them to get it once they start to work. Of course it can be done—but it is hard, mighty hard."

A large employment agent, specializing on placing business women, does not philosophize on the value of a college education, but deals in facts, only.

"I simply know this," he tells us. "Most employers specify college graduates in hiring women. They don't do it so much with men, but they do with wo-

men. Why? Guess it must be because they are better workers.

"Nine times out of ten, when I place a college graduate with no business training alongside a business woman with no higher education, within two years my college graduate is head and shoulders above the other—in position and salary, both.

"The theory of education doesn't interest me particularly. All I know is that the woman with the diploma usually gets the salary in the long run. Anyway, I find it pays me to scan graduation lists of the different colleges and universities in my locality and ask the women graduates to register with me. Satisfied customers are my bread and butter, and I find I can best satisfy the business men I serve by sending them college-trained women.

"Of course I sort of weed them out myself, and when a woman comes in here with the notion a diploma is going to get her access to the company's strong room I just naturally lose interest in her. She must have common sense as well as a college education in order to do business with me."

All of which would indicate that a college training is the most valuable thing in the world.

Microscopical Tests of Steel

MORE and more attention is paid to the results of microscopical examination of steel, iron, and other metals, to detect faults and structural peculiarities. Special microscopes have been devised for such purposes.

An English metallurgic engineer some time ago reported the results of such an examination of a fractured stay-bolt from a British man-of-war, and drew important conclusions. The examination revealed many minute flaws, chiefly composed of microscopic segregations of sulphid of manganese or sulphid of iron.

The bolt had been subjected to a great strain, and it is believed that a line of weakness in the metal, originating at one or more of the micro flaws, promoted the final fracture. The opinion was expressed that steel is not as good a material as the best wrought iron for boiler stay-bolts.

Luggage Carrier for the Baby Carriage

Who wants to pile all the bundles on the baby or carry them in one arm while pushing the carriage with the other? We have luggage carriers for the auto and bundle carriers for the bicycle. Here comes a simple carrier for the baby carriage. A collapsible carrier can be made as indicated and will be found worth its weight in gold.

Bend two stiff wires the shape shown in the illustration and sew them into a cloth container so they will not be quite so far apart as the distance between the handles of the baby carriage. Slip two



DETAIL OF COLLAPSIBLE CARRIER - SHOWING ITS CONSTRUCTION

of the hooks over the back of the carriage and two over the crossbar connecting the handles and there you have it!

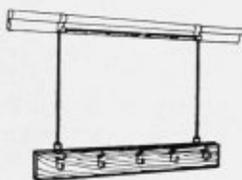
Such a carrier can be instantly attached or removed, will carry considerable goods and will be out of the way of both the occupant and the one pushing the carriage.

A Unique Hat and Coat Hanger

A very useful hat and coat hanger for either temporary or permanent use may be easily made at home by any handy member of the family. This article will be found convenient whenever company is expected. Instead of having them throw their wraps over beds or chairs, the hanger is simply hung in place.

To make this hanger, get a smooth board about 3 feet long (smaller if desired), 3 inches wide and $\frac{7}{8}$ inch thick. Stain and varnish or paint any color desired. After it has dried, fasten to the

surface as many coat hangers as will conveniently fit the space. On the top edge of the board fasten two screw eyes about 6 inches from each edge. Attach some heavy picture wire, of any length desired, to the screw eyes. Fasten the other ends



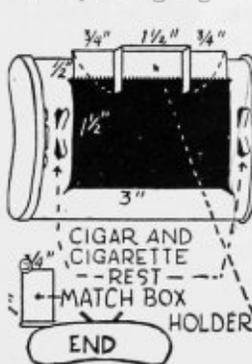
The Wire Should Be Twisted Around Two Hooks

of the wire to two picture molding hooks.

When your guests have departed, simply remove the hooks from the picture molding until another occasion arises. Your friends will appreciate the fact that their wraps are free from wrinkles and it will be a real pleasure for them to visit you again.

Cheap Ash Tray

To secure an opening for receiving ashes and material for shaping a match box holder, mark off a rectangle about 3 by $1\frac{1}{2}$ inches on back of can. Cut this along three sides, leaving one side of 3 inches uncut. Bend piece up and back to a level with the can. About $\frac{1}{2}$ inch from line of bending, bend piece up again to a perpendicular. At both ends of new line of bending make incision of about $\frac{3}{4}$ inch. The flaps obtained are bent forward to an inward slant. The result is a firm match box holder. To make rests for depositing cigars or cigarettes, pairs



of wedge-shaped figures about $\frac{1}{2}$ inch wide, with their bases facing each other, are cut in the ends of the can. The points of wedges are lifted and shaped to fit cigar or cigarette.

The edges of can should be slightly bent inward to avoid possible cutting of fingers. To remove ashes from tray, simply open lid of can. If neatly done, this novel equipment of the smoker will prove an attraction.

Is the Female of the Species More Deadly Than the Male?

(Continued from page 386)

jarred the brute's fangs in his flesh. Loto gazed at the carrots a moment and then relaxed his clamp on the unconscious assistant's thigh. The man was carried to safety, and only the most expert care saved the loss of his leg. He still walks with great difficulty and confines his training activities to seals.

One is not likely to consider the gentle-eyed camel as a dangerous beast when one sees him in the menagerie chewing his cud and gazing superciliously down his long nose at the curious along the guard rope. And it is a rare thing for the ship of the desert to attack a human being. But in the two cases known to American circus men, male camels have been the guilty parties, and both attacks resulted in the deaths of the victims, for the bite of the camel is poisonous.

In San Francisco ten years ago a camel turned on its attendant, biting him savagely in the shoulder. The man had given the beast its cue to kneel, a thing he did several times each day, when the creature turned on him in sudden anger. Two weeks later, the attendant died from blood poisoning. In the other instance, a camel, stepping down the ramp during the unloading of the show in Roanoke, Virginia, missed its footing and fell to the ground, breaking a leg. A boy who had been caring for it several seasons, rushed to its side to help it to its feet, when the hurt animal sank its teeth in his arm. The youngster died a victim of blood poisoning shortly afterward.

With a certain circus last year it was desired that pictures of Nellie Roth, a pretty girl trainer, be secured with her arm about the neck of a lion. The picture was desired, but the getting of it proved difficult. Hours were spent with two males, but just as it seemed they were of a disposition to sit still for the camera, and Nellie cautiously began to slip an arm about the neck of either, Louis, her husband, one of the greatest of trainers, would detect in the animals' tails or ears symptoms of treacherous attack. Finally, he was compelled to run the males from the arena and bring out "Nellie," a lioness, named after his wife. The two Nellies took several poses for the cameraman, took them with entire good

nature, with "Nellie," the lioness, manifestly just as anxious to look pleasant as the girl trainer.

In reviewing the attacks that lions, leopards, pumas, tigers and jaguars have made on trainers now handling "cat" animals in this country, one is amazed to note that in not a single case has a female been the aggressor, that not a female has "jumped" a man or woman trainer now working. It is certainly a great record for the ladies of the circus "cat" colonies. Trainers such as John Helliot, Louis Roth, John Guilfoyle, Frank Jacobs, Dolly Castle, Mabel Stark, Nellie Roth, Lorraine Battey and Felix Bernardi have been torn and ripped time and again, but in every instance it was a male "cat" that sprang with murderous intent. The lady "cats" have always borne in mind that they are ladies.

Without doubt the largest elephant ever seen in America is the great Tusko, an inch taller than was the famous Jumbo. Tusko is the priceless feature of a wild animal circus—a giant tusker that strikingly reminds onlookers of prehistoric mammoths. His tremendous height and bulk no doubt come partly as the result of the years spent with the Clark wagon show—years in which he walked from town to town in the early mornings at the tag end of a show's wagon train.

There can be little doubt that this walking gave Tusko his unusual development, and the lack of this daily exercise has embittered his life with the railroad show during the last two years. Tusko misses his long, daily constitutionals, and he has raised the devil on three occasions because of their loss. At Palms, California, last winter, he decided to take a stroll, so he burst his leg chains, walked through two barred doors and four heavy gates and ambled out on the Los Angeles to Venice auto highway—Washington Boulevard—with half a dozen mounted trainers endeavoring to turn him back. Tusko paid them no heed, but walked on, stepping out happily and zestfully with eight-foot strides. He made a circle of nine miles before he passed the show's winter quarters, from whence he had escaped, and where a double line of men,

(Continued on page 442)



The initials of a friend

You will find these letters on many tools by which electricity works. They are on great generators used by electric light and power companies; and on lamps that light millions of homes.

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GENERAL ELECTRIC

Is the Female of the Species More Deadly than the Mail?

(Continued from page 440)

armed with pitchforks, stood across the roadway to stop and head him in the gateway.

The big tusker came on without the least slackening of his pace, and the men, pitchforks forgotten, scattered before the irresistibility of that advance. On and on walked Tusko, and twice more he passed the gate before he felt that he had exercised sufficiently. On the last lap, "Cheerful" Gardiner, his head trainer, had stood in his saddle alongside and leaped to the huge elephant's head, where he seated himself. "Cheerful" took his life in his hands when he jumped, but, as it happened to turn out, Tusko gave no sign that anything untoward had occurred. As the tusker approached the gate for the third time, Gardiner cued him to turn in, and the elephant responded. That closed the big fellow's first impromptu marathon.

Later in the year, at Sedro Woolley, Washington, Tusko took his exercise more seriously. He took it on the run, breaking off one of his four-foot tusks, breaking down many yards of fencing, flattening several cottages and sheds and costing the circus about fifteen thousand dollars in all in payment for damages to property. The show world was not surprised, and, perhaps with some jealousy, remarked, "He's a male, and sooner or later all male elephants, especially the big ones, go bad."

Old-timers, discussing the inherent badness in male elephants, tell of the day when a bad male "bull" was all that stood between a party of stranded American circus men in Mexico and stark want, even starvation. "Busted" gringos have never been popular in the interior of the sister republic to the south. It was the David Gillespie wagon show, and it had invaded Mexico with no menagerie, except "Rubber," an undersized, outlaw elephant, which Gillespie had bought because he wished to "show them greasers an elephant with tusks." The little circus struck bad business in Sonora, and kept striking it, until its horses, all eight of them, were attached. The elephant was safe, because the Mexicans were afraid of its costly appetite.

The situation was desperate, when the

general agent, back with the show because there was still food on the troupe and none ahead of it, conceived the idea of varying the lure of the Sunday bull fight by having "Rubber" battle the wildest and fiercest of the bulls. Sporting Mexicans liked the idea, and the most grand battle to the death between the ferocious elephant and the fiercest of untamed Andalusian bulls was scheduled in the bull ring. It was to be a great day, "Ah, *senor*," exulted the *jefe politico*, "the fierce bull, with its terrible horns, will gore the elephant to mortal hurt at the first charge." "It will like h—!" exploded Gillespie, and an argument ensued, which ended in the showman's wagering the money guaranteed him for the elephant's services against a like sum bet by the *jefe*.

It was an anxious group of troupers that watched the preliminaries in the ring that Sunday, while "Rubber" lumbered unconcernedly about in the arena below them. Soon, amid bugling, cheering and much galloping about of retainers, the wild bull, maddened by the waving of red cloaks and the prickling of darts, was loosed, and the arena cleared of all but the bull and the elephant. The snorting bull pawed the earth until it sighted the elephant and then it charged. It struck the unconcerned "Rubber" and bounced back. The elephant, not realizing that this was the most grand battle to the death, was hardly annoyed. But the bull did it again, with the crowds, figuring the pachyderm afraid to fight, cheering. The bull struck "Rubber" from the rear, and the elephant, raising a hind foot, kicked. The bull's head was literally smashed into its body, and it fell dead.

Gillespie, detailing men to rescue the gallant "Rubber," rushed to collect his money. It was no time at all until the showmen were riding "the cushions" back into the States, with "Rubber" anchored in a box car ahead.

And so, if American circus folk believe that under the menagerie top the female of the species is not more deadly than the male, and that the male is frequently very deadly indeed, they also believe that there is good in the worst of the zoo's sterner sex.

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Remember the Empty Lot?

The older fellows were playing ball and you were watching, wondering if you would ever get a chance to play. You knew if you only got a chance you would show them. Sure enough, one day they bellowed, "Come on, kid, grab a ball!" Your chance at the pill had come. That is the way with life. Your chance at the pill will come, but, if you want to stay on the team, you will have to deliver the goods—and that you can do only if you are prepared. The big money and the permanent job go to the man "who knows."

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Grizzly Hunting *a la* Robin Hood

(Continued from page 373)

at one blow. Truly, this was a grizzly, a great bear, probably the slayer of Jack Walsh the year before, and the same animal that had treed a party of surveyors and kept them treed all night. No other bear tracks appeared in his territory; no other male animal of his kind was allowed to hunt in his range. He was the king of the bears of this section and, putting our bows and arrows in condition, we laid a campaign to get him. For days we tramped the mountains. We were trained down to rawhide and sinew, our bowstrings were not more taut than our muscles, our bows not stiffer than our legs.

We soon learned that the big fellow was a night-rover, visiting his kills, of which we found several, only in the darkness, and that he crossed one creek, in the bed of a deep canyon, always at a certain fixed place. Along the side of this canyon, he mounted to the plateau above by one of three possible trails. At the top, within forty yards of one trail, was a small promontory of rock on which we built a blind of young jack pines, some three by six feet in area, with a quantity of fallen timber between us and the trail, which we hoped would delay him enough in his charges to enable us to drive home sufficient arrows to stop him when he charged, as a wounded male grizzly is sure to do. The perpendicular face of the outcropping elevated us some twelve or thirteen feet above the trail, but, as we had learned that no man can climb a tree fast enough to escape a grizzly charging from a distance of less than fifty yards, we did not put too much confidence in this elevation. The wind blew up the canyon carrying our scent away from the trail, and there was a dead elk at the top of the plateau, so that we had suitable conditions for an ambush.

We watched in the blind from dusk to sunrise, dressed in our warmest clothing and each wrapped in a piece of thick canvas. The nights were cold, and the ground pitilessly hard. One morning, as we moved slowly back to camp, we met, full in the trail, three little bear cubs and behind them, less than thirty-five yards away, the largest and fiercest-looking female grizzly we had ever seen. She

scented us, growled, champed her jaws, and, apparently failing to see us, dropped to all fours and waddled away, leading the cubs. She was magnificent, large, finely proportioned, covered with dark brown hair tipped with silver, and we marked her well for future reference after we had disposed of the great bear of Dunraven Pass.

Several nights passed with no signs of the big bear or the large female. Just at dawn the first female and her two cubs came along and with one arrow I shot and killed one of the cubs, which weighed 120 pounds. The mother and the other cub fled.

That night we got our first glimpse of the big male bear. He came up the canyon, chasing a brown bear, treed him, shook the tree, reached up and scratched as high as he could, and went off another way. We measured the scratches and found them to be seven feet six inches from the ground. He was a real bear and we wanted him more than ever. The succeeding night, as we lay silently in the blind, out of the canyon came the handsome, big female silvertip and her royal family—the four which we had met in the trail and which had turned away from us. The little fellows pattered up the trail ahead of her, and, as they came within range, Young and I let fly at them. Each arrow struck a cub. There was a squeak from each, a roar from the mother, a jumble of shadowy figures, and then the whole family of bears came toward us.

At that very moment, moving softly out of the shadows, came the King of Dunraven Pass. Moving his head from side to side, alternately rising and walking on his hind legs, and then dropping to all fours, the big silvertip came on behind the female, apparently his mate, and the cubs. I whispered to Young, "Shoot the big fellow," at the same time drawing an arrow to the head and driving it into the chest of the oncoming female. She reared, threw herself sideways, bellowed, staggered, and fell, rose again, stumbled forward and fell down dead. There were now five silvertip grizzly bears in sight, one of them dead,

(Continued on page 446)

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Grizzly Hunting a la Robin Hood

(Continued from page 444)

the others, three cubs and the huge male. The cubs ran up the hill, then one returned and sat on its mother's head, and finally ran away again into the darkness.

While all this was going on, the monster male grizzly was moving back and forth in the forest shadows, not more than sixty-five yards away. With deep, booming growls he slipped on noiseless feet between the tree trunks, the moonlight here and there casting weird frescoes of light on his enormous body. Young discharged three arrows at him, and I shot two. He was so large that it seemed impossible to miss, yet he galloped off, and I saw my last arrow, let go at a point blank distance of at least seventy-five yards, fall between his legs. He was gone, and, as Ishi, my Yana Indian companion on many bow-and-arrow hunts, used to say, "grief descended upon us." After nights of cold and uncomfortable waiting, we apparently had lost him.

When our excitement had abated a little, we skinned the female, finding her to be in excellent condition, with a fine skin. My arrow had severed a rib and buried its head in her heart. At day-break, we found one of the cubs under a log, dead, with an arrow through its brain. The other two had disappeared.

We had no idea whether we had hit the big bear, but just to gather up our shafts we went over the ground along the trail he had made in running away. When we had reached the limit of our shots, we found that one of Young's arrows was missing. That gave us a sudden thrill. Forgotten were the uncomfortable nights, the cold, the long watches, the flight of the great bear. Pressing on, we found a trace of blood beside his tracks in the fallen leaves. We continued to trail him, though we knew that it was dangerous—the more so as

we had no arms but our bows and our skinning knives.

Presently, we found a place where he had rested. An unwounded bear, frightened, or traveling rapidly, would have kept on going. Then we discovered blood where he had lain. A little farther on we found the forward half of Young's arrow; beyond this was the feathered end, where the bear had drawn it from the wound and chewed it to splinters. Four times we came on places where he had wallowed in the mud or soft earth to cool his wound. Then we lost his track on a patch of stones. For five hours we searched for it until we were so worn out that we slept in his last track.

Near sundown we woke and started again in circles, endeavoring to pick up a bloodstain or a track, but he seemed to have ceased to bleed externally and the ground was so hard that he left no track. At last, climbing over a rough rock, we saw one drop of blood. We let ourselves down the farther side of this rock and there lay the huge grizzly—dead—flat on his back against a boulder. Only one arrow had struck him, and that one shaft, shot by Young, had penetrated twenty-six inches of grizzly bear skin and flesh, slicing the heart and producing ultimate death, though he had traveled several miles before he succumbed.

He weighed approximately 1,000 pounds, for we cut him up and weighed the pieces. He was seven feet four inches in length, and stood four feet high at the shoulders. His skull was eighteen and one-half inches in length, the largest grizzly bear reported in recent years—in fact, since these animals were wiped out by the rifle in California. And he was killed by a single arrow, driven from a bow made with our own hands.

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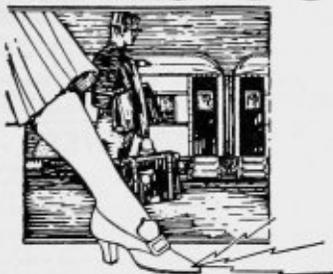
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