



p. 87/88 missing



DIRECTORY
OF THE
IRON AND STEEL WORKS
OF THE
UNITED STATES AND CANADA

NINETEENTH EDITION CORRECTED TO MAY 1st, 1920.



r TS301.A6

19th ed.

Directory of the iron and
steel works of the United
States and Canada
New York, N.Y. : The
Institute,

AMERICAN IRON AND STEEL INSTITUTE
61 BROADWAY, NEW YORK
1920

PG69.102

A51

v.19

1920.

COPYRIGHT, 1920, BY THE
AMERICAN IRON AND STEEL INSTITUTE

PRINTED BY J. B. LIPPINCOTT COMPANY
AT THE WASHINGTON SQUARE PRESS
PHILADELPHIA, U. S. A.

LETTER OF TRANSMITTAL.

HON. ELBERT H. GARY, PRESIDENT,

American Iron and Steel Institute, New York City.

DEAR SIR: Herewith is submitted a new edition of the Directory of Iron and Steel Works of the United States and Canada. This is a revision of the eighteenth edition published by the American Iron and Steel Institute in 1916 and a continuation of similar works published from time to time by the American Iron and Steel Association of Philadelphia.

As in previous editions, the present edition of the Directory of Iron and Steel Works includes all companies, firms and individuals engaged in the manufacture of pig iron, steel, hot rolled products, charcoal blooms and tinplates and terne plates.

The last previous revision of the Directory was published in 1916. So many changes in company organization and plant equipment have taken place since that time that it was necessary to rewrite the entire book.

Additional information concerning plant equipment, incorporated for the first time in the edition of 1916, has been continued in the present edition. The more important of these additions comprise, with regard to blast furnace plants, a statement of blowing capacity, blowing engines and boilers, slag disposal, sintering and nodulizing plants, etc.; in rolling mill descriptions, a more exact description of heating furnaces and rolling equipment.

In order to present this additional information and to keep the size of the book within reasonable limits, a system of abbreviations has been adopted. In general the word can be readily identified in its abbreviated form; where any doubt arises reference should be made to the Table of Abbreviations provided for that purpose.

The method of arrangement adopted in editions of the Directory previous to that of 1916, which had been found to be cum-

bersome, inconvenient and productive of frequent duplications and repetitions, has been entirely discarded and the companies are treated in one alphabetic list. Nevertheless, the advantages of the former geographic arrangement have been retained by giving supplementary lists of blast furnaces, steel works, steel casting plants and rolling mills, arranged by States and localities in which the plants are situated. A system of abbreviations used in connection with these lists shows the kinds of pig iron made, the process by which steel ingots and castings are made and whether such products are for the use of the company or for sale. Supplementary lists also give the names of the companies manufacturing leading rolled products, galvanized sheets, tinplates and terne plates, cut and wire nails and wrought pipe.

Historical connection with the previous edition of the Directory has been provided for by the insertion, in the alphabetic list of companies, of notes describing the changes in plant ownership, changes in corporate title, and the dismantlement of plants. The length of time since the last revision and the consequent large number of such changes have made these notes very numerous; and in order to distinguish more significant matter from these notes, the titles of active companies have been given in the alphabetic list in display type.

In the preparation of this volume I have been ably assisted by Mr. William G. Gray, especially with regard to the preparation of the tables showing geographic distribution and of the lists of manufacturers.

HOWARD H. COOK,
Assistant Secretary.

NEW YORK, JULY 1, 1920.

TABLE OF CONTENTS.

	PAGES
LETTER OF TRANSMITTAL.....	iii
TABLE OF ABBREVIATIONS.....	vi
ALPHABETIC LIST OF COMPANIES.....	1
ADDENDA.....	397
LIST OF BLAST FURNACES (ARRANGED GEOGRAPHICALLY)	403
LIST OF MANUFACTURERS OF FERRO-ALLOYS AND PIG IRON IN ELECTRIC FURNACES (ARRANGED GEOGRAPHICALLY).....	416
LIST OF PLANTS MAKING STEEL INGOTS (ARRANGED GEOGRAPHICALLY)	419
LIST OF PLANTS MAKING STEEL CASTINGS (ARRANGED GEOGRAPHICALLY)	432
LIST OF ROLLING MILLS (ARRANGED GEOGRAPHICALLY).....	448
MANUFACTURERS OF ROLLED STEEL BILLETS.....	467
MANUFACTURERS OF SHEET BARS AND TINPLATE BARS.....	469
MANUFACTURERS OF RAILS.....	469
MANUFACTURERS OF STRUCTURAL SHAPES.....	470
MANUFACTURERS OF WIRE RODS.....	471
MANUFACTURERS OF UNIVERSAL AND SHEARED PLATES.....	472
MANUFACTURERS OF BLACK SHEETS.....	474
MANUFACTURERS OF GALVANIZED SHEETS.....	475
MANUFACTURERS OF BLACK PLATES FOR TINNING.....	476
MANUFACTURERS OF TINPLATES AND TERNE PLATES.....	477
MANUFACTURERS OF MUCK BAR.....	477
MANUFACTURERS OF MERCHANT BARS, INCLUDING CONCRETE BARS	478
MANUFACTURERS OF TOOL AND HIGH SPEED STEEL.....	482
MANUFACTURERS OF HORSESHOE BARS AND HORSESHOES.....	483
MANUFACTURERS OF HOOPS, BANDS AND COTTON TIES.....	484
MANUFACTURERS OF ROLLED LONG ANGLE SPLICE BARS, LONG TIE PLATE BARS, ETC.....	485
MANUFACTURERS OF IRON AND STEEL SKELP.....	485
MANUFACTURERS OF HOT ROLLED STRIP STEEL, NOT INCLUDING THOSE WHO MAKE COLD ROLLED STRIPS ONLY.....	486
MANUFACTURERS OF WROUGHT IRON AND STEEL PIPE AND BOILER TUBES	487
MANUFACTURERS OF SEAMLESS STEEL TUBES.....	487
MANUFACTURERS OF WIRE NAILS.....	488
MANUFACTURERS OF CUT NAILS.....	489

TABLE OF ABBREVIATIONS.

A.	Auditor.	G.S.M.	General Sales Manager.
A.A.	Assistant Auditor.	G.P.A.	General Purchasing Agent
A.G.M.	Assistant General Manager.	G.W.M.	General Works Manager.
A.G.S.	Assistant General Superintendent.	h.	high (2-h., 3-h., etc., two-high and three-high rolling mills respectively.)
A.G.S.M.	Assistant General Sales Manager.	ham.	hammer or hammers.
A.M.	Assistant Manager.	heat.	heating.
A.O.H.	acid open hearth.	H.P.	horse power.
A.P.	Assistant to President.	inc.	incorporated.
A.S.	Assistant Superintendent.	lb.	pound.
A.Sc.	Assistant Secretary.	lbs.	pounds.
A.T.	Assistant treasurer.	Ltd.	Limited.
auth.	authorized.	M.	Manager.
Ave.	Avenue.	mach.	machine or machines.
Bess.	Bessemer.	M.D.	Managing Director.
bit.	bituminous.	M.S.	Manager of Sales.
Bldg.	Building.	nat.	natural.
blt.	built.	O.H.	open hearth.
Blvd.	Boulevard.	orig.	originally.
B.O.H.	basic open hearth.	org.	organized.
Bros.	Brothers.	P.	President.
bu.	bushels.	p.	page.
C.	Comptroller or Controller.	pp.	pages.
cap.	capacity.	P.A.	Purchasing Agent.
C.E.	Chief Engineer.	port.	portable.
cfm.	cubic feet per minute.	pref.	preferred stock.
Ch.	Chairman.	press.	pressure.
Co.	Company.	prod.	producer or producers.
com.	common stock.	Prop.	Proprietor.
comb.	combination.	reblt.	rebuilt.
Conn.	Connellsville. (coke)	regen.	regenerative.
cont.	continuous.	reheat.	reheating.
Corpn.	Corporation.	rel.	relined.
cum.	cumulative.	remod.	remodeled.
d.	door (1-d., 2-d., etc., with one door, with two doors, etc.)	R.R.	railroad.
Dept.	department.	Ry.	railway.
dia.	diameter.	S.	Superintendent.
eng.	engine or engines.	S.A.	Sales Agent.
enl.	enlarged.	Sc.	Secretary.
est.	established.	S.F.	Superintendent of Blast Furnaces.
etc.	etcetera.	S.M.	Sales Manager.
Ex.Com.	Executive Committee.	St.	Street.
f.o.	first put in operation.	st.	in plant descriptions, stand or stands. (2-st., 3-st., etc., with two stands, with three stands, etc.)
F.S.	Blast Furnace Superintendent.	s.t.	single turn.
fur.	furnace or furnaces.	S.W.	Superintendent of Works.
galv.	galvanizing.	T.	Treasurer.
G.F.A.	General Freight Agent.	T.M.	Traffic Manager.
G.M.	General Manager.	V.Ch.	Vice-Chairman.
gran.	granulating.	V.P.	Vice President.
G.S.	General Superintendent.	'	Feet.
G.S.A.	General Sales Agent.	"	Inches.

The ordinary abbreviations for States, Provinces (Canada), and months are used but are not included in above table.

ACME STEEL & MALLEABLE IRON WORKS, Inc., 245 Military Road, Buffalo, N. Y.

Inc. June 8, 1914 in New York. Reorganized Jan., 1917. Capital stock: com. auth. \$300,000, issued \$200,000; pref. 7% cum. \$300,000; bonds \$100,000.

David J. Carson, P.; D'Arcy W. Roper, V. P. & G. S. M.; C. J. Brandt, Sc.; F. K. Hiser, T.; W. C. Letchworth, G. M.; C. A. Swallow, G. S.

Selling agents:

Cleveland, Russell H. Winship, 415 Schofield Bldg.

Detroit, Cochran & Phillips, 1520 East Jefferson Ave.

New York, J. W. Sanders Co., 30 Church St.

Works at Buffalo: one 3-ton electric fur., installed 1917-18; f. o. Oct., 1918.

Product: medium and light electric steel castings for sale, annual cap., 1,200 tons; malleable iron castings, annual cap., 4,000 to 5,000 tons.

ACME STEEL CO. (The), Akron, Ohio.

Inc. Sept. 26, 1916 in Ohio. Capital stock: com. \$100,000.

J. George Shaw, P.; at 1171 National Ave., Milwaukee, Wis.

J. H. Miller, V. P.; L. D. Carter, Sc., T. & G. M.; at Akron.

Works at Akron, Ohio: leased from the Northern Ohio Traction and Light Co.; one 2-ton Tropenas converter, f. o. July, 1917; 1 cupola. Fuel, coke.

Product: steel castings for sale for motor and general machinery; annual cap., 1,500 tons.

ACME STEEL GOODS CO., 2834-2840 Archer Ave., Chicago, Ill.

Inc. 1880 in Illinois. Capital stock: com. auth. 60,000 shares, no par value, issued 41,000 shares; pref. 7% auth. \$2,000,000, outstanding \$600,000.

James E. MacMurray, P.; Frederick C. Gifford, V. P.; Ralph H. Norton, V. P. & Sc.; Donald MacMurray, T.

Sales offices:

Atlanta, J. R. Regnas, 10-14 Tift St.

Los Angeles, M. E. Canfield, Van Nuys Bldg.

Montreal, J. E. Beauchamp Co., 321 Craig St. West.

New York, H. G. Merrill, 167 41st St., Brooklyn.

New Orleans, J. C. Brill & Co., Queen & Crescent Bldg.

San Francisco, R. S. Hunter & Co., 209 California St.

Seattle, S. J. Johnson & Co., 114 Railroad Ave.

Vancouver, T. A. Walsh, 7 Alexander St.

The company owns plants at Chicago and Riverdale, Ill.

Chicago plant: 50 stands of 10" cold rolls; 45 stands of various other sizes, cold mills; electro galvanizing dept.; heat treating dept.; tempering and enameling dept.; punch press and specialty dept. Product: light cold rolled strip steel; annual cap., 30,000 tons.

Riverdale plant at Riverdale, Ill.: blt. 1918-19; f. o. June 1, 1919; 1 Morgan cont. billet heat. fur.; 1 gas producer; 12" 2-h. 13-st. Morgan mill. Installing twenty 10" 2-h. 2-st. cold mills, annual cap., 3,000 tons cold rolled strip. Fuel, prod. gas. Product: hoops and bands, 1" to 3" wide, 13 to 25 gage; annual cap., 60,000 tons.

Adams, W. T., Corinth, Miss., see 1916 Directory, p. 1, owns Birmingham Steel & Iron Works, Birmingham, Ala., one 10-ton B. O. H. fur. long idle and for sale.

ADAMSON MACHINE CO. (The), 730 Carroll St., Akron, Ohio.

Inc. Dec., 1907 in Ohio. Capital stock: com. auth. \$500,000, issued \$227,600.

Alexander Adamson, P. & G. M.; W. E. Slabaugh, V. P.; R. B. Koontz, Sc. & T.; L. D. Wolfsperger, G. S.; J. W. Tyrrell, P. A. Works at Akron, Ohio: two 2-ton Tropenas converters (idle); one 10-ton A. O. H. fur., f. o. Nov. 20, 1917; 2 cupolas. Fuel, oil. (Formerly owned by the Akron Steel Casting Co. Acquired by Adamson Machine Co. in Aug., 1914 and merged in that company in 1918).

Product: rubber machinery, molds, general machinery; gray iron and steel castings for own use and for sale; annual cap., 5,000 tons open hearth steel castings, 4,000 tons gray iron castings.

Adirondack Steel Foundries Corporation, Watervliet, N. Y.

Building steel casting plant at Watervliet.

ADRIAN FURNACE CO., Dubois, Pa.

Inc. Oct. 27, 1904 in Pennsylvania. Capital stock: com. \$200,000.

L. W. Robinson, P.; George H. Clune, T.; at Rochester, N. Y. B. M. Clark, V. P.; at Punxsutawney, Pa. F. G. St. Clair, Sc., G. M., A. & P. A.; C. H. Emerick, G. S. M.; at Dubois.

Adrian Furnace, Dubois, Pa.: 1 stack, 80' x 19' 6"; blt. 1902-03; f. o. Aug. 10, 1903; relined May, 1917; 4 Julian Kennedy stoves 80' x 22'; 3 steam blowing eng. (22,000 cfm.); 10 water-tube B. & W. boilers, 2,500 H. P.; 1 slag gran. pit, annual cap. 109,500 tons. Reynoldsville coke; Lake ore. (Leased; owned by the Rochester and Pittsburgh Coal and Iron Co.)

Product: foundry pig iron; annual cap., 90,000 tons.

Adrian Steel Casting Co., Adrian, Mich., see 1916 Directory, p. 1.

Works at Adrian destroyed by fire in August, 1916; the gray iron foundry was rebuilt immediately but the manufacture of steel castings was discontinued.

ÆTNA IRON & STEEL CORPORATION, Ætna, Ind.

Inc. Sept. 20, 1919 in Delaware. Capital stock: com. auth. 10,000 shares, no par value, issued 7,500 shares; pref. 7% cum. auth. \$2,000,000, issued \$1,000,000.

Chester E. Wirt, P.; Charles L. George, V. P. & G. M.; Harry P. Reichard, Sc.; Andrew R. Miles, T.; at Ætna. W. F. Hodges, V. P.; at City Hall, Gary, Ind.

Plan to build works at Ætna, Ind., construction to begin in March, 1920, to be completed in Fall of 1920; 8 pair and 8 sheet fur.; 8 black sheet mills (38" to 44"); 8 cold mills (26" x 44"); 4 double annealing fur.; 2 Mesta pickling machines. Product: black and blue annealed sheets, annual cap., 70,000 tons.

Ætna Iron & Steel Co., Victoria, B. C., Canada, see Port Moody Steel Works, Ltd.

ÆTNA NUT CO. (The), Southington, Conn.

Inc. 1867 in Connecticut. Capital stock: com. \$150,000.

James H. Pratt, P.; James W. Upson, Sc.; Paul B. Kennedy, T.; John Griffiths, G. S.

Works at 67 High St., Southington: blt. 1872-73; 3 busheling fur.; 1 squeezer; 4 heat. fur. (one 2-d. scrap, three 2-d. billet); 18" 2-h. 2-st. billet, 10" 3-h. 4-st. and 8" 3-h. 5-st. merchant mills; 2 hand pickling tanks. Fuel, coal.

Product: billets; merchant bars, rounds, half-rounds, ovals, squares, etc.; horseshoe toe and heel calks; annual cap., billets 4,500 tons; merchant bars, 4,200 tons.

ÆTNA STEEL CASTINGS CO. (The), 2284 Scranton Road, Cleveland, Ohio.

Inc. in 1914 in Ohio. Capital stock: com. \$100,000; pref. 8% cum. auth. \$200,000, issued \$100,000.

Formerly known as Brennan Steel Castings Co., name changed to Ætna Steel Castings Co., June, 1916.

A. W. Fenton, Jr., P.; H. E. Gresham, Jr., V. P. & T.; H. E. Gresham, Sc.

Works at Cleveland: blt. 1912-13; one 3,000-lb. Calumet converter; first steel made 1913; one cupola. Fuel, coke. Product: steel castings for general purposes for sale. Annual cap., 2,400 tons.

Works at Lorain, Ohio: construction begun Nov. 1, 1919; one 5-ton A. O. H. fur. completed and f. o. April 1, 1920; annual cap., 2,500 tons steel castings for sale.

Akron Steel Casting Co., see 1916 Directory, p. 2, owned and operated by Adamson Machine Co., was merged in last named company in 1918.

ALABAMA CO. (The), Birmingham, Ala.

Inc. April 17, 1913 in Delaware. Capital stock: com. \$2,000,000; pref. 7% cum. auth. \$2,100,000, issued \$2,000,000; bonds \$2,166,000.

E. N. Rich, P.; Joshua Levering, 2 V. P.; W. O. Peirson, Sec.; at Baltimore, Md. H. W. Coffin, 1 V. P.; J. W. Porter, T. & G. S. M.; W. J. Davis, A.; E. C. Morgan, G. S.; E. B. Heiser, P. A.; at Birmingham.

Selling agents: Hickman, Williams & Co., for Chicago, Cincinnati, Louisville and St. Louis territory; Tuffli Bros. Pig Iron & Coke Co., St. Louis, Mo., for Western territory.

Brands: "Clifton" and "Etowah."

Product: foundry and forge pig iron; specialty, low-phosphorus high-manganese iron; annual cap., 300,000 tons.

Plants: the company owns and operates 2 blast furnace plants iron ore, coal and coke, and limestone properties formerly owned and operated by the Alabama Consolidated Coal and Iron Co.; acquired by The Alabama Co., April 26, 1913.

Clifton Furnaces, Ironaton, Ala.: 2 stacks; No. 1, blt. 1884, rebt. 1896-7, 70' x 17' 2"; 5 Whitwell-Cowper stoves; No. 2, blt. 1889-90, last rebt. 1914, 75' x 16'; 4 Whitwell-Cowper stoves; 4 steam blowing eng. (60,000 cfm.); 10 water-tube boilers, 5,000 H. P. Alabama coke; local brown hematite ore. Product: low-phosphorus, high-manganese pig iron, annual cap., 100,000 tons.

Etowah Furnaces, Gadsden, Ala.: 2 stacks; No. 1, blt. 1905, f. o. June 7, 1907, 78' x 18'; 4 Whitwell stoves. No. 2, blt. 1902-3, f. o. Aug. 22, 1903, rebt. 1918, 86' x 19'; four 4-pass Whitwell-Cowper stoves; 7 steam blowing eng. (107,800 cfm.); 18 water-tube boilers, 5,720 H. P. Coke; local red and brown hematite ores. Product: foundry and forge pig iron; annual cap., 200,000 tons.

The company owns about 1,750 acres of land at Gate City, Ala.; containing deposits of red iron ore, limestone, dolomite, etc. Hard red ore mines have been opened on this property at Hammond, Ala. About 2,500 acres of mineral lands and 15,000 acres of timber and other lands were acquired with the Clifton Furnaces; and 730 acres of ore and other lands with the Etowah Furnaces. The company acquired about 3,700 acres of land near Gadsden containing deposits of red iron ore and a large acreage of lands containing brown iron ore. Mines have been developed on these properties with a daily cap. of 600 tons. At Hematite, Georgia, the company owns 1,700 acres of brown iron ore lands with ore washers.

The company operates coal mines and coke ovens at Lewisburg, Searles and Brookwood, Ala.

The company acquired 32,211 acres of coal and timber lands from the Standard Coal Co. of which 7,000 acres have been sold. There are 915 beehive coke ovens on the property. Over 3,000 acres of

coal lands at Lewisburg, near Birmingham, were acquired in 1901 from the Jefferson Coal and Railway Co. On this property are two coal openings and 350 beehive coke ovens. The total annual cap. of the coke ovens is about 300,000 tons.

The company also owns about 300 acres of limestone lands, situated between the Clifton and Etowah furnaces, on which it operates a limestone quarry.

ALAN WOOD IRON & STEEL CO., 1801 Widener Bldg., Philadelphia, Pa.

Inc. Dec. 1, 1901 in Pennsylvania. Capital stock: auth. \$9,000,000; issued com. \$6,265,100, pref. \$675,700.

Richard G. Wood, Ch.; Jonathan R. Jones, V. Ch.; W. W. Lukens, P.; Ledyard Heckscher, V. P.; Howard Wood, Jr., V. P. & T.; John W. Logan, Sec.; A. M. Harry, A. Sc. & A. T.; Alan D. Wood, P. A.; Charles O. Hadly, G. S. M.; Willard S. Haring, A. G. S. M.; J. H. Woodhead, C.; D. P. Sailer, A.; G. A. Heckscher, M. Blast Furnace Dept.; Richard G. Wood, Jr., M. Steel Works Dept.; W. A. Cooper, M. Sheet Dept.

Sales offices:

Boston, 141 Milk St.
Cleveland, 1321 Rockefeller Bldg.
Fort Worth, Texas Reynolds Bldg.
New York, 50 Church St.
San Francisco, 461 Market St.

Brands: "Swede" for pig iron; "AW" for steel and finished products.

Product: basic and foundry pig iron, steel ingots, nickel and chrome alloy steel ingots; billets and slabs, sheared plates, boiler, ship, tank, bridge plates; blue annealed and red steel plates, floor plates, checkered plates, etc.; black sheets, blue annealed sheets, deep stamping and automobile sheets.

Swede Furnaces, Swedeland, Pa.: 3 stacks: No. 1, 80' x 18', blt. 1850, last rebilt. 1905; No. 2, 85' x 20' 6", blt. 1912, f. o. April 25, 1912; No. 3, 86' x 24', blt. 1917-18, f. o. Jan. 8, 1920; 12 hot blast stoves (3 Roberts 80' x 20', 1 Kennedy 90' x 20', 4 Roberts 100' x 21', 4 Kennedy 110' x 24'); 5 steam blowing eng. and 2 turbo-blowers (200,000 cfm.); 27 water-tube boilers, 10,800 H. P., furnish electric power also to Ivy Rock and Conshohocken plants; 2 Uehling pig casting machines; Dwight & Lloyd sintering plant for flue dust, annual cap., 45,000 to 90,000 tons. By-product coke: Lake ore. **Product:** basic and foundry pig iron, annual cap., 475,000 tons.

Ivy Rock Steel Works, Ivy Rock: blt. 1902-03; 12 B. O. H. fur. (nine 65-ton, three 75-ton); one 300-ton metal mixer; six 4-hole soaking pits; six 4-d. regen. heat. fur.; 58 gas producers; 35" 2-h. 1-st. blooming mill; 38" 2-h. 1-st. universal mill (interchangeable with blooming mill); 30" x 84" 3-h. roughing and 30" x 84" 3-h.

finishing plate mills. Product: ingots (500,000 tons); blooms, billets and slabs (300,000 tons) and sheared plates (125,000 tons). Schuylkill Iron Works, Conshohocken, Pa.: blt. 1857; 13 heat. fur. (two 1-d. eleven 3-d.); 1 pair and 3 sheet fur.; 1 gas producer; 5" 2-h. 1-st. bar; two 26" x 72" 3-h., two 24" x 54" 3-h. and one 24" x 48" 3-h. sheared plate mills; one 22" x 48" and two 22" x 42" black sheet mills; 2 single stand cold mills, 24" x 48" and 22" x 42"; 2 box annealing fur.; 7 open annealing fur.; 1 Mesta pickling machine; 1 steam hammer (5-ton). Fuel, pulv. coal, coke and prod. gas. Product and annual cap.: 70,000 tons sheared plates and 5,000 tons black sheets.

J. Wood Dept., Conshohocken, Pa.: blt. 1832; four 1-d. heat. fur.; 2 open annealing fur.; 26" x 72" 3-h. and 26" x 60" 3-h. sheared plate mills. Fuel, bit. coal. (Formerly owned by J. Wood and Brothers Co.; acquired by Alan Wood Iron & Steel Co., Mar. 14, 1917.) Product: sheared plates; annual cap., 25,000 tons.

ALASKA TREADWELL GOLD MINING CO., Mills Bldg., San Francisco, Cal.

Works at Treadwell, Alaska: one 2-ton Heroult electric fur. Product: steel castings and gray iron castings for own use; annual cap., 300 tons steel castings, 300 tons gray iron castings.

Alberta Rolling Mills Co., Ltd. (The), Medicine Hat, Alberta, Canada, see 1916 Directory, p. 5; acquired by Canadian Western Steel Corp.

Alcania Co. (The), Pittsburgh, Pa., see 1916 Directory, p. 5. Works at Avonmore, Pa., sold Oct. 4, 1917 to Schlieper Engineering Co., Pittsburgh, and plant dismantled in 1917.

ALGOMA STEEL CORPORATION, Sault Ste. Marie, Canada.

Inc. May, 1912, in Ontario, Canada.

Capital stock: com. \$15,000,000; pref. 7% cum. auth. \$15,000,000, issued \$10,000,000; bonds \$21,492,000. The entire capital stock is owned by Lake Superior Corp.

W. C. Franz, P.; James Hawson, 2 V. P. (Finance); J. D. Jones, 3 V. P. (Operations); Ernest W. Shell, T.; E. Carey, C.; James W. Gemmell, A.; C. E. Duncan, G. S.; J. D. Gray, G. S. M.; L. L. Jacobs, P. A.; at Sault Ste. Marie. Herbert Coppel, 1 V. P.; at 52 William St., New York. Alex Taylor, Sc.; at 1428 Bank of Hamilton Bldg., Toronto.

* Sales offices:

Montreal, G. A. Irwin, 606 McGill Bldg.

Toronto, Rex E. Nicholson, 1428 Bank of Hamilton Bldg.

Brand: "Algoma."

Product: bessemer, basic, malleable and foundry pig iron; ingots, slabs, blooms, billets; rails, structural shapes up to 15" beams and channels, splice bars, tie plates, merchant bars; iron castings; brass, bronze and copper castings; coke and sulphate of ammonia.

Algoma Steel Works, Sault Ste. Marie.

Blast Furnaces: 4 stacks: No. 1, blt. 1901-03, f. o. Mar. 6, 1905, 70' x 17'; No. 2, blt. 1901-03, f. o. Oct. 17, 1904, 80' x 17'; No. 3, blt. 1909-11, f. o. April 13, 1911, 90' x 22' 6"; No. 4, blt. 1917-18, f. o. Mar. 23, 1918, 85' x 18' 6"; seven 2-pass stoves, 70' x 18'; 4 Kennedy stoves, 90' x 22', 1 Roberts & 3 McKee stoves 90' x 18'; nine 2,200 H. P. 4-cylinder twin tandem gas engines, 5 with blowing tubs, 4 direct-connected to 1,500 K. W. generators for furnishing power to docks and mills; 4 steam blowing engines; two 1,500 H. P. turbo-blowers; 3 double-strand casting machines. Molten metal to mixers. By-product coke: Michipicoten and Lake ore. Product: bessemer, basic, malleable and foundry pig iron, annual cap., 500,000 tons.

By-product coke plant: 110 Koppers by-product ovens, 50 Wilputte by-product ovens, annual cap., 625,000 net tons of coke. By-product recovery plant and sulphuric acid plant, annual cap., 30,000 tons tar, 8,000 tons sulphate of ammonia.

Open Hearth Dept.: 11 stationary B. O. H. fur. (eight 50-ton, three 75-ton); mixer (300-ton); first O. H. steel made May 3, 1907. Annual cap., 420,000 tons ingots.

Duplex Dept.: One Bessemer converter (20-ton); 4 cupolas; mixer (200-ton); one 150-ton tilting fur. Annual cap., 180,000 tons ingots.

Rolling Mill Dept.: six 4-hole soaking pits; 3 gas-fired regen. reheat. fur.; 2 cont. heat. fur.; 35" 2-h. 1-st. reversing blooming; 32" 2-h. 1-st. reversing blooming and billet; rail and structural mill with 23" 3-h. 1-st. roughing, 23" 3-h. 1-st. intermediate, 28" 3-h. 1-st. finishing; 18" 3-h. 4-st. and 12" 3-h. 5-st. merchant mills. Rail finishing shop. Rail fastening dept. for finishing tie plates, splice bars and continuous joints. Annual cap.; 445,000 tons of rails and structural shapes, 55,000 tons merchant bars, angles, rail fastenings, etc.

Auxiliary Depts.: Machine shop, foundry, forge, boiler shop, frog and switch shop, pattern shop, electrical shop, car repair shop.

Yard railways with 34 miles track, 15 standard and 8 narrow gauge locomotives, 14 locomotive cranes.

Iron ore properties: The company owns the Helen and the Magpie iron mines on the Michipicoten Range located about 11 miles north of Michipicoten Harbor where the company owns an ore dock. Ore roasting plant at the Magpie mine. The company owns several other undeveloped iron ore deposits.

Limestone properties: the company owns valuable limestone properties on the Canadian Islands, east of Sault Ste. Marie, and also owns the entire capital stock of the Fiborn Limestone Co., which owns and operates quarries at Fiborn and Ozark in upper Michigan.

Coal properties: The company owns the entire capital stock of the Cannerton Coal and Coke Co., which controls 5,000 acres of coal in Kanawha Co., W. Va., with four mines producing 4,500 tons per

day. The company also owns the Lake Superior Coal Co., which controls 2,000 acres of Pocohontas coal in McDowell County, W. Va., with present daily production of about 1,500 tons.

ALLEGHANY ORE AND IRON CO., Buena Vista, Va.

Inc. Mar. 4, 1902 in Virginia. Capital stock (all owned by the Lukens Steel Co.): com. auth. \$2,000,000, issued \$1,225,000; pref. 7% non-cum. auth. \$1,000,000, issued \$875,000.

H. B. Spackman, P.; Howard Taggart, Sc.; at Coatesville, Pa. R. S. Lackey, T. & G. S. M.; O. M. Stull, S. Blast Furnaces; F. F. Musgrove, P. A.; at Buena Vista, Va. J. W. Stull, S. Mines; at Lignite, Va.

Sales agent: R. S. Lackey, Buena Vista, Va.

Brands: "Alleghany" and "Buena Vista."

Product: high-manganese foundry, forge, basic, and special car-wheel pig iron, total annual cap., 70,000 tons.

Alleghany Furnace, Iron Gate, Va.: 1 stack, 65' x 13' 4", blt. 1891-2, rebt. 1900; 1 Foote and 3 Taws & Hartman improved Whitwell stoves; 2 steam blowing eng. (17,000 cfm.); 7 boilers (1 water-tube, 2 tubular, 4 flue) 1,050 H. P. New River Coke: Oriskany brown hematite ore from Oriskany Mines. Product: foundry and basic pig iron, annual cap., 30,000 tons.

Buena Vista Furnace, Buena Vista, Va.: 1 stack, 70' x 16', blt. 1889-90, rebt. 1903; 1 Foote and 3 Whitwell stoves; 3 steam blowing eng. (30,000 cfm.); 16 boilers (2 water-tube, 14 flue) 1,700 H. P. Pocahontas coke: Oriskany ore.

Product: foundry and chill-cast basic pig iron; chill-cast pig iron for car wheels, annual cap., 40,000 tons.

Gem Furnace, Shenandoah, Va., dismantled in 1917.

The company owns and operates the Oriskany iron-ore mines at Oriskany and Lignite, and the Reid mine at Oriskany, Va. The annual cap. of these mines is about 150,000 tons. Company is also interested in Liberty Lime & Stone Co., which is developing a limestone quarry at Rock Point, near Natural Bridge, Va.

ALLEGHENY STEEL CO., Brackenridge, Pa.

Inc. May 11, 1905 in Pennsylvania. Capital stock: auth. \$3,500,000, issued \$3,139,700.

Harry E. Sheldon, P.; James O. Carr, V. P.; L. W. Hicks, V. P.; R. D. Campbell, V. P. & T.; F. H. Stephens, Sc. & A.; Vere B. Browne, G. M.; O. B. Lindquist, G. S.; Paul F. Voigt, Jr., G. S. M.; E. L. McGraw, P. A.

Sales offices:

Chicago, John L. Harrison.

Detroit, J. Allan Armstrong.

New York, Chandler & Floyd, Inc.

Allegheny Steel Works, Brackenridge, Pa.: blt. 1900-01; 8 B. O. H. fur. (one 90-ton, four 80-ton, one 65-ton, one 55-ton, one 45-ton);

1 A. O. H. fur. (30-ton); 41 heat. fur. (one cont. ingot, two 1-d. welding, four 2-d. bar, nine 2-d. sheet, three 3-d. bar, eight 3-d. sheet, one 4-d. slab, ten 6-d. bar, 2 cont. slab., one 5-d. slab); 21 gas prod.; eight 4-hole soaking pits; 28" 3-h. 1-st. sheet bar mill; 32" 3-h. 1-st. blooming; 30" x 110" 3-h. sheared plate mill; 17 hot black sheet mills (27" x 44", five 27" x 40", three 27" x 36", six 30" x 44", 30" x 52", 30" x 60"); 2 trains cold rolls 5-st. and 10-st. 26" x 50" to 26" x 66"; 15 box annealing fur.; 6 pickling mach.; 2 lap-weld fur., 2" O. D. to 6" O. D.; 4 forging presses (three 250-ton, one 1,200-ton). Fuel, coal, nat. and prod. gas.

Product: steel ingots and castings and gray iron castings for own use and for sale, sheet and tinplate bars, sheared plates, black sheets, boiler tubes, shell forgings, miscellaneous forgings, pressed steel, cut plate washers $\frac{3}{8}$ " to 2", hot and cold stampings; annual cap., 222,000 tons ingots (210,000 tons basic, 12,000 tons acid), 7,000 tons A. O. H. steel castings, 18,000 tons gray iron castings, 150,000 tons sheet and tinplate bars, 66,000 tons sheared plates, 90,000 tons black sheets, 12,000 tons boiler tubes, 15,000 kegs washers, 12,000 tons forged products, 8,000 tons pressed steel and hot and cold stampings.

ALLENTOWN IRON MANUFACTURING CO., Brick & Furnace Sts., Allentown, Pa.

Furnaces at Allentown: 2 stacks; No. 1, 30' x 6', blt. 1909, f. o. Sept. 13, 1909; No. 2, 30' x 8', blt. 1910, f. o. Jan. 6, 1911; 2 steam blowing eng. (3,000 cfm.); 2 flue boilers, 130 H. P. Charcoal: local brown hematite ore.

Product: cold-blast charcoal pig iron, annual cap., 3,000 tons.

ALLIED STEEL CASTINGS CO., 12000 South Racine Ave., Chicago, Ill.

Inc. 1918 in Illinois. Capital stock: com. \$250,000.

John T. Llewellyn, P.; Charles J. Nash, V. P.; James S. Llewellyn, Sc., T. & G. M.; K. V. Wheeler, Works M.

Works at West Harvey, Ill.: one 2-ton Whiting converter, f. o. 1914; one 5-ton A. O. H. fur., f. o. June, 1918; bldg. one 10-ton A. O. H. fur.; 2 cupolas. (Formerly owned by Whiting Foundry Equipment Co.; acquired by present owners June, 1918.)

Product: steel castings for sale; specialty, railroad steel castings; also steel ingots; annual cap., 300 tons converter castings; 5,000 tons open hearth castings.

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis.

Plan to install about May 1, 1920 at Norwood Works, Norwood, Ohio, one 3-ton acid Moore electric fur., annual cap., 1,200 tons steel castings, principally for own use.

Allison, J. Wesley, Morrisburg, Ont., Canada, see 1916 Directory, p. 9. Works at Morrisburg dismantled 1917.

Alloy Steel Works, Ltd., 400 Front St. East, Toronto, Canada. Works at Toronto: electric fur. for manufacture of steel castings. Company now in process of liquidation.

ALTOONA IRON CO. (The), Altoona, Pa.

Inc. July 10, 1873 in Pennsylvania. Capital stock: \$150,000.

Joseph D. Findley, P.; H. K. McCauley, Sc., T., G. M., G. S. M. & P. A.; B. M. Mitchell, G. S.

Brand: "Altoona."

Works at 9th Ave. & 30th St., Altoona: f. o. April, 1873; 11 double and 6 single puddling fur.; 1 rotary squeezer; five 2-d. heat. fur.; 4 trains (18" 3-h. 1-st. muck, 16" 3-h. 3-st. bar, two 8" 3-h. 4-st. guide); one 3-ton drop ham. Fuel, bit. coal.

Product: refined bar, band, hoop, oval, half round and scroll iron; specialties, staybolt iron, steel "S" and "Z" tie checks, brake-shoe key iron, brake levers, and padded switch plates rolled in continuous bars; annual cap., 24,000 tons.

Amalgamated Machinery Corporation, Chicago, acquired plant of National Steel Casting Co., New Cumberland, W. Va., in 1918; and sold it to Thomas R. Heyward, Jr., in Aug., 1919.

American Brake Shoe & Foundry Co., 30 Church St., N. Y., see 1916 Directory, p. 10, crucible steel furnaces at Chattanooga and Mahwah Works dismantled.

AMERICAN BRIDGE CO., Frick Bldg., Pittsburgh, Pa.

Inc. April 14, 1900 in New Jersey. Subsidiary of the United States Steel Corporation.

August Ziesing, P.; Richmond F. Ball, Sc.; F. E. Wiley, T.; Frank B. Thompson, A.; W. G. A. Millar, P. A.; at Pittsburgh. Joshua A. Hatfield, V. P.; at 30 Church St., New York.

Sales offices:

Baltimore, H. A. Warren, Continental Trust Bldg. *

Boston, S. P. Waldron, John Hancock Bldg.

Buffalo, F. D. Rideout, Marine Nat'l Bank Bldg.

Chicago, F. J. Llewellyn, 208 South La Salle St.

Cincinnati, H. M. Knapp, Union Trust Bldg.

Cleveland, E. M. Sprague, Guardian Bldg.

Detroit, J. C. Munn, Beecher Ave. & M. C. R. R.

Duluth, W. G. Zimmermann, Wolvin Bldg.

Minneapolis, Floyd E. Cates, 7th Ave. & 2nd St., S. E.

New York, A. L. Davis, 30 Church St.

Philadelphia, Charles Rieder, Jr., Widener Bldg.

Pittsburgh, R. W. Bailey, Frick Bldg.

Salt Lake City, Elmo V. Smith, Walker Bank Bldg.

St. Louis, E. E. Green, Third Nat'l Bank Bldg.

St. Louis, E. A. C. Wahlers, 1014 So. Vandeventer Ave.

Selling agents: United States Steel Products Co. for all export business, 30 Church St., New York; for Pacific Coast business, Rialto Bldg., San Francisco.

Brand: "Pencoyd."

Product: manufacture and erect railroad and highway bridges, steel buildings, barges, turntables, electric furnaces, etc.; steel ingots and castings; channel bars, deck beams, tees, angles, flats, rounds, bar and bridge steel, shafting, steel blooms, eye-bars, general forgings, iron castings, etc.; bolts, nuts, rivets, washers, spikes, etc.

Ambridge Plant, Ambridge, Pa. Bridge works for steel bridges, buildings and other structures, and yard for building steel barges and steamboat hulls (161,000 net tons). Forge shops for the production of forged steel eye-bars, 2" to 16" wide (18,000 net tons) and other forgings (1,200 net tons). Steel foundry: blt. 1904-05, f. o. May 16, 1905; one 15-ton A. O. H. fur. Fuel, prod. gas. Product: steel castings, annual cap., 8,600 tons. Gray iron foundry (5,400 tons); brass foundry (150 tons). Bolt nut, and rivet shop (11,000 net tons).

American Plant, 40th St. & Stewart Ave., Chicago.

Bridge Works (27,600 net tons); forge shop (2,400 net tons).

Canton Plant, Dueber Ave. & Bridge St., Canton, Ohio.

Bridge Works (9,600 net tons).

Detroit Plant, Beecher Ave. & M. C. R. R., Detroit.

Bridge Works (22,200 net tons).

Edge Moor Plant, Edge Moor, Del.

Bridge Works (33,600 net tons).

Elmira Plant, Elmira, N. Y.

Bridge Works (48,000 net tons).

Gary Plant, Gary, Ind.

Bridge Works (133,300 net tons). Forge shop (24,000 net tons).

Machine shop for jobbing and finishing rough forgings.

Lassig Plant, Clybourn & Wrightwood Aves., Chicago.

Bridge Works (39,600 net tons).

Minneapolis Plant, 7th Ave. & 2nd St., S. E., Minneapolis.

Bridge Works (12,000 net tons).

Pencoyd Plant, Pencoyd, Pa.: rolling mill, blt. 1852; steel works, blt. 1887; 11 B. O. H. fur. (seven 30-ton, four 35-ton); four 2-hole soaking pits; 2 cont. heat. fur.; 3 reheat. fur., (one 7-d., one 6-d., one 5-d.); 36" 2-h. 1-st. blooming; 28" 2-h. 1-st. roughing; 23" 3-h. 2-st. finishing; 23" 3-h. 1-st. roughing and 23" 3-h. 2-st. finishing; 12" 3-h. 4-st. and 12" 2-h. 1-st. finishing; 5 steam ham. (500 to 2,500-lb.); 3 hydraulic forging presses (one 75-ton, two 300-ton). Fuel, prod. gas and coal. Bridge Works (92,600 net tons). Gray iron, steel and brass foundry. Product: 240,000 tons steel ingots, 3,200 tons steel castings, 2,700 tons gray iron castings, 80 tons brass castings; 220,000 tons structural shapes.

St. Louis Plant, 1014 So. Vandeventer Ave., St. Louis.

Bridge Works (9,600 net tons).

Shiffler Plant, 48th St. & Allegheny Valley Ry., Pittsburgh.

Bridge Works (26,400 net tons.)

Shiffler Tower Plant, 51st St. & Allegheny Valley Ry., Pittsburgh.

Makes plain and galvanized steel towers and poles for electrical transmission (9,600 net tons).

Toledo Plant, East Broadway & L. S. & M. S. Ry., Toledo, Ohio.

Bridge Works (31,200 net tons).

Trenton Plant, foot of Warren St., Trenton, N. J.

Bridge Works and yard for building steel barges (46,800 net tons).

Total annual capacity: 240,000 tons basic open hearth steel ingots, 11,800 tons open hearth steel castings (8,600 acid, 3,200 basic); 8,100 tons gray iron castings, 230 tons brass castings; 220,000 tons structural shapes (190,000 tons heavy, 30,000 tons light shapes); 769,700 net tons of fabricated structural work and forgings.

AMERICAN CAR & FOUNDRY CO., 165 Broadway, New York.

Inc. 1899 in New Jersey. Capital stock: com. \$30,000,000; pref. 7% non-cum. \$30,000,000.

Wm. H. Woodin, P.; Wm. M. Hager, A. P.; J. M. Buick, V. P.; W. C. Dickerman, V. P.; W. F. Kingston, V. P.; S. S. Delano, T.; H. C. Wick, Sc.; G. R. Scanland, A.; W. E. Hedgcock, P. A.; F. A. Stevenson, Ass't. V. P.; at New York. Herbert W. Wolff, V. P.; at Railway Exchange Bldg., Chicago. N. A. Doyle, V. P.; at St. Louis. District managers: Berwick, Pa., W. F. Lowry; Chicago, A. H. Gairns; Huntington, W. Va., John W. Ensign; St. Charles, Mo., J. G. Lawler; Detroit, Joseph C. Johnston; St. Louis, T. A. Dooley; Wilmington, Del., Alfred H. Gawthrop; Memphis, Tenn., Charles A. Price; Buffalo, N. Y., W. H. Sanford; Terre Haute and Indianapolis, Ind., E. D. Buick, Terre Haute; Jeffersonville, Ind., C. T. Hertzsch, Acting D. M.; Depew, N. Y., E. G. Englehart, Ass't. D. M.; Milton, Pa., Frank Faust, A. D. M. Sales offices: Chicago, New York, St. Louis, and at all plants. Registrar: Central Trust Co., New York City.

Transfer agent: Guaranty Trust Co., New York City.

Brands: "Berwick," "Detroit," "Helmbacher" and "Ozark."

Product: all kinds of wooden, steel-underframe and all-steel freight and passenger cars (128,000 freight, 1,850 passenger); chilled cast-iron wheels for locomotives and cars (1,250,000); mine car wheels (100,000); gray iron and malleable castings (82,500 tons); rolled and hammered iron and steel car axles; all kinds of railroad, steamboat and machinery forgings; bolts, nuts, and rivets; brass castings; merchant bars, axles, shafts, links and pins.

The company operates the car-building works listed below. The products made at each plant are stated and the annual capacity given in parentheses. It operates four rolling mills, see below

- under Berwick Plant, Detroit Rolling Mill Dept., Madison Rolling Mill and St. Louis Rolling Mill.
- Berwick Plant, Berwick, Pa.: blt. 1872; 10 double puddling fur.; one rotary squeezer; 6 heat. fur. (two 3-d., four 4-d.); 18" 3-h. 2-st. muck; 18" 3-h. 4-st. bar, 12" 3-h. 5-st. guide; 9" 3-h. 5-st. guide mills. Fuel, bit. coal. Product: muck bar (24,000 tons), merchant bars (36,000 tons), straight rolled iron and steel axles (10,000 tons). Also produce wooden and steel cars (20,000 freight, 600 passenger); freight car wheels (200,000); mine car wheels (75,000); gray iron castings (12,000 tons); forgings (6,000 tons for sale); bolts $\frac{3}{8}$ " to 2"; square nuts $\frac{1}{2}$ " to $1\frac{1}{8}$ ", hexagon nuts $\frac{3}{4}$ " to $\frac{7}{8}$ ".
- Bloomsburg Plant, Bloomsburg, Pa. Product: wooden and steel-underframe freight cars (3,000).
- Buffalo Plant, Buffalo, N. Y. Product: wooden and steel-underframe freight cars (5,000); chilled cast iron wheels (100,000); bolts $\frac{3}{8}$ " to 2"; light railroad forgings (1,000 tons for sale).
- Chicago Plant, Paulina & Blue Island Aves., Chicago, Ill. Product: wooden and steel-underframe freight cars (12,000); chilled cast iron car wheels (250,000); gray iron castings (15,000); bolts $\frac{3}{8}$ " to 2"; light railroad forgings (2,000 tons for sale).
- Depew Plant, Depew, N. Y. Product: wooden and steel-underframe freight cars (10,000); bolts $\frac{1}{2}$ " to 2"; light railroad forgings (3,000 tons for sale). Operates at present for repair work only.
- Detroit Plant, Detroit, Mich. Product: wooden and steel freight cars (20,000); gray iron castings (15,000 tons); bolts $\frac{3}{8}$ " to 2"; light railroad forgings (4,000 tons for sale).
- Detroit Rolling Mill Department, 1303 West Jefferson Ave., Detroit, Mich.: forge blt. 1870; rolling mill, 1877; rebt. 1892 after fire; four 4-d. heat. fur.; 16" 3-h. 3-st. bar; 12" 3-h. 4-st. with 2-st. Belgian roughing. Fuel, coal. Product: steel bars, hollow drill rods; annual cap., steel bars, 90,000 tons, drill rods 500 tons.
- Huntington Plant, Huntington, W. Va. Product: wooden and steel freight cars (9,000); chilled car wheels (100,000), mine and logging wheels (25,000); gray iron castings (10,000 tons); bolts $\frac{3}{8}$ " to 2"; light railway forgings (1,500 tons for sale).
- Indianapolis Plant, West Indianapolis, Ind. Now used for repairing freight cars only. Product: bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (1,000 tons for sale).
- Jefferson Plant, Jeffersonville, Ind. Product: wooden and steel passenger cars (400); bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (2,500 tons for sale).
- Madison Plant, Madison, Ill. Product: wooden and steel freight cars (15,000); chilled cast iron wheels (350,000); bolts $\frac{3}{8}$ " to 2"; light railroad forgings (2,000 tons for sale).
- Madison Rolling Mill, Madison, Ill.: blt. 1900-1, rebt. 1902 after fire; 5 single puddling fur., 4 double puddling fur.; 1 rotary squeezer; four 4-d. heat. fur.; one 3-d. pile heat. fur.; 20" 3-h. 2-st. muck;

16" 3-h. 3-st. bar; 9" 3-h. guide with 4-st. 9" and 1-st. 14" Belgian roughing. Fuel, coal. Product: muck and scrap bar, merchant bar and guide iron; annual cap., 35,000 tons muck and scrap bar, 54,000 tons merchant bars.

Memphis Plant, Memphis, Tenn. Works at Binghampton, Tenn. Product: wooden and steel-underframe freight cars (5,000); gray iron castings (5,000 tons); bolts, $\frac{1}{2}$ " to 2" and rivets, $\frac{1}{2}$ " and 1"; light railroad forgings (3,000 tons for sale).

Milton Plant, Milton, Pa. Product: tank cars (10,000).

St. Charles Plant, St. Charles, Mo. Product: wooden and steel passenger cars (400); gray iron castings (5,000 tons); malleable iron castings (3,000 tons); brass castings (75 tons); bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (2,500 tons for sale).

St. Louis Plant, St. Louis, Mo.: Product: wooden and steel freight cars (20,000); chilled cast-iron wheels (250,000); gray iron castings (17,500 tons); bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (1,000 tons for sale).

St. Louis Rolling Mill, 133 West Barton St., St. Louis, Mo.: blt. 1858; 1 single and 2 double puddling fur.; 1 busheling fur.; 2 pile fur.; 1 rotary squeezer; four 4-d. heat. fur.; 18" 3-h. 2-st. muck; 18" 3-h. 3-st. bar; 10" 3-h. 5-st. guide mills; two forge heat. fur.; 2 steam hammers (1,500-lb., 2,000-lb.). Fuel, bit. coal. Product: muck and scrap bar, rod and band iron; coupling links and pins, follower plates and pull rods; annual cap., 35,700 tons muck and scrap bar, 59,000 tons finished rolled products.

Terre Haute Plant, Terre Haute, Ind. Product: wooden and steel-underframe freight cars (9,000); bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (1,000 tons for sale).

Wilmington Plant, Wilmington, Del. Product: wooden and steel cars (300 passenger, 150 street cars); sectional work for export a specialty; bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (300 tons for sale). Also builds and repairs wooden vessels, car floats, lighters, etc., and operates a marine railway; manufactures and erects all kinds of architectural wood work in residences and office buildings.

Total annual capacity of the 4 rolling mill plants: 94,700 tons muck and scrap bar, 239,000 tons iron and steel merchant bars, bolt and nut rods, etc.; 10,000 tons rolled axles.

American Chain Co., Inc., Bridgeport, Conn., acquired Hayden Rolling Mill, Columbus, Ohio, formerly owned by Standard Chain Co., Jan. 1, 1917. Work of dismantling this mill was begun in March, 1920. See also Highland Iron and Steel Co. and Page Steel & Wire Co.

AMERICAN CLAY MACHINERY CO., Bucyrus, Ohio.

R. C. Penfield, P. & G. M.; at New York. L. W. Penfield, 1 V. P. & M.; at Willoughby, Ohio. J. P. Penfield, 2 V. P.; H. C. Penfield, A. T.; R. O. Perrott, Sc. & M.; E. A. Baker, A. Sc.; at Bucyrus, Ohio.

Company operates works at Bucyrus and Willoughby, Ohio, for the manufacture of clay-working and sand lime brick machinery; steel casting plant at Bucyrus Works.

Bucyrus Works, Bucyrus, Ohio: 2 Whiting converters added in 1918, f. o. Jan., 1919.

Product: steel castings for own use, annual cap., 6,000 tons.

AMERICAN ELECTRICAL WORKS, Phillipsdale, R. I.

Frank N. Phillips, P.; Eugene R. Phillips, V. P.; W. C. Ingerson, Sc.; J. E. Hayward, T.; S. F. Worden, A. T.; C. H. Wagenseil, M.; E. H. Hammond, G. S. M.

Works at Phillipsdale: equipped with machinery for the manufacture of copper rods, wire, etc.; occasionally roll iron or steel wire rods and hoops.

AMERICAN FOUNDRY & MACHINE CO., 870 South 4th St., West, Salt Lake City, Utah.

Inc. 1913 in Utah. Capital stock: com. \$200,000; bonds \$119,000.

Nathan Rosenblatt, P.; Moriss Rosenblatt, V. P. & T.; Simon Rosenblatt, Managing Director; J. M. Margetts, Sc.; J. W. Irvine, G. S.; P. A. Mattingly, G. M.; G. F. Olson, A. Sc. & P. A.

Works at Salt Lake City: 1 Rennerfelt electric fur. (3-ton); f. o. Dec., 1916.

Product: steel castings for sale for railroad and mining equipment; annual cap., 2,500 tons. Gray iron and brass castings for sale; annual cap., gray iron 3,500 tons, brass 50 tons.

AMERICAN HOIST AND DERRICK CO., St. Paul, Minn.

Oliver Crosby, W. O. Washburn, at St. Paul; F. J. Johnson, at Chicago; Managing Partners.

Sales offices:

Birmingham, Ala., 1405 North 31st St.

Chicago, Ill., 1113 Fischer Bldg.

Detroit, Mich., 407 Pennsylvania Ave.

New Orleans, La., 712 Union St.

New York City, 50 Church St.

Pittsburgh, Pa., 2114 Farmers Bank Bldg.

Seattle, Washington, 1512 L. C. Smith Bldg.

Works at St. Paul: 2-ton Tropenas steel converter, blt. 1900; f. o. July 1, 1900. Fuel, coke. Machine shop for own use.

Product: steel castings for own use, annual cap., 2,500 tons. Make gray iron castings; annual cap., 5,000 tons.

AMERICAN HORSESHOE CO., Phillipsburg, N. J.

Inc. April, 1895. Capital stock: \$500,000.

E. R. Yarnelle, P.; C. H. Holton, V. P.; Charles G. Shirer, V. P. & G. M.; Thomas F. Tighe, Sc. & A. T.; H. J. Morrison, G. S. Brand: letter "A" in circle.

Works at Phillipsburg, N. J.; telegraph address, Easton, Pa.: blt. 1865; 17 heat. fur. (twelve 3-d. and five 4-d. coal-fired); three 9" 3-h. 3-st., one 18" 3-h. 1-st. bar mills. Fuel, coal.

Product: horseshoe bars for own use; horseshoes and toe-calks. Annual cap., 10,000 tons of iron and steel bars.

American Iron & Steel Manufacturing Co., Lebanon, Pa., see 1916 Directory, p. 16, was sold to the Bethlehem Steel Co., Jan. 1, 1917.

AMERICAN LOCOMOTIVE CO., 30 Church St., New York, N. Y.

Inc. June 10, 1901 in New York. Capital stock: com. \$25,000,000, pref. 7% cum. \$25,000,000; bonds \$1,932,000.

Andrew Fletcher, P.; Leigh Best, V. P.; C. K. Lassiter, V. P.; J. B. Ennis, V. P.; James D. Sawyer, V. P.; Joseph Davis, V. P. & C.; W. Spencer Robertson, Sc.; J. O. Hobby, Jr., T.; Harry Fulton, A. C.; J. D. Finn, A. Sc.; P. Walkley, A. T.; at New York.

The company operates plants at Schenectady and Dunkirk, New York; Richmond, Va.; Pittsburgh, Pa.; Paterson, N. J.; and Montreal Canada, for the manufacture of all kinds of locomotives and repair parts for locomotives and tenders. Also a steel casting plant at Chester, Pa., for locomotive and general castings for own use and for sale.

Chester Works, Chester, Pa.: blt. 1900; f. o. Dec. 29, 1900; 3 A. O. H. fur. (two 20-ton and one 25-ton). Fuel, oil. (Formerly owned by Seaboard Steel Casting Co.; acquired by Penn Seaboard Steel Corp., May, 1916, and sold by them to American Locomotive Co., July 2, 1917.)

Product: locomotive and general steel castings, 300-lb. and upwards, for sale and for own use; vanadium alloy steel castings; annual cap., 28,800 tons.

AMERICAN MACHINE & MANUFACTURING CO., 872 North Ashby St., Atlanta, Ga.

Inc. April, 1907 in North Carolina. Capital stock: com. auth. \$500,000, issued \$400,000.

J. W. Conway, P.; A. D. Kennedy, V. P. & G. M.; C. H. O'Neill, A. Sc. & A. T.; C. J. Barnett, A.; H. S. Smith, Steel Foundry S.; L. L. Dalton, P. A.; at Atlanta.

Company operates machine shops and a steel casting plant at Atlanta, Ga.

Steel Plant at Atlanta, Ga.: blt. 1917; one 5-ton McLain A. O. H. fur.; f. o. Sept. 5, 1917; 1 cupola. Machine shop for own use. Fuel, oil and coke.

Product: steel castings for sale and own use in making crushing machinery for cotton seed, copra, peanuts, etc., annual cap., 3,000 tons; also gray iron castings.

AMERICAN McKENNA PROCESS CO., Colby-Abbot Building, Milwaukee, Wis.

Howard Morris, P.; Minard Lister, Sc.; E. J. Tapping, T. & G. M. Joliet Plant (owned), Joliet, Ill.: blt. 1897; f. o. Aug. 11, 1897; two 4-d. coal-fired reverb. heat. fur.; 24" 2-h. 1-st. roughing and 24" 2-h. 1-st. finishing, arranged tandem. Fuel, bituminous coal. Machine shop for own use. Product: renewed rails, annual cap., 100,000 tons.

Kansas City Plant (leased), Kansas City, Kansas: blt. 1898; f. o. Aug. 16, 1898; two 5-d. heat. fur.; 24" 2-h. 1-st. roughing and 24" 2-h. 1-st. finishing, arranged tandem. Fuel, bituminous coal. (Owned by the McKenna Steel Working Company). Product: renewed rails, annual cap., 100,000 tons.

Tremley Point Plant (owned), Tremley Point, N. J.: blt. 1901-3; f. o. 1903; three 2-d. heat. fur.; 2 trains (each 28" 2-h. 1-st.). Fuel, coal. Product: renewed rails, annual cap., 180,000 tons. Total annual cap., 380,000 tons of renewed steel rails.

AMERICAN MANGANESE MANUFACTURING CO., 352 Bullitt Bldg., Philadelphia, Pa.

Inc. Dec. 31, 1913 in Pennsylvania. Capital stock: com. \$6,000,000; pref. 6% cum. \$6,000,000; bonds \$1,287,633.

Edward E. Marshall, P.; William Selfridge, V. P. & Sc.; William E. Arnold, A. Sc. & A. T.; at Philadelphia. William H. Locker, V. P. & T.; at 410 Lonsdale Bldg., Duluth, Minn. H. Cook, A.; L. S. Kerchner, G. M.; Reginald Palmer, P. A.; at Dunbar, Pa.

Dunbar Furnaces, Dunbar, Pa.: 2 stacks; Furnace No. 1, 80' x 19' 6", blt. 1790, last rebt. 1900. Furnace No. 2, 80' x 17', blt. 1880, rebt. 1905-06; 7 Whitwell-Roberts stoves (five 92' x 18', one 76' x 22', one 75' x 18'); 3 steam blowing eng. (56,000 cfm.); 10 water-tube boilers, 3,900 H. P.; circular pig casting machine. Conn. coke: Lake ore, manganese ore from Cuyuna range. Also 110 Semet-Solvay by-product, and 225 (idle) beehive coke ovens; annual cap. of by-product ovens, 185,000 net tons. Small gray iron foundry and machine shop for own use. Slag roofing plant, operated by another company, is located on property.

Product: high-manganese, foundry and forge pig iron; spiegeleisen and ferro-manganese. Total annual cap., 150,000 tons.

The company also owns the capital stock of the Cuyuna-Duluth Iron Co. and the Cuyuna-Mille Lacs Iron Co., iron and manganese ore mines on the Cuyuna Range, Iron-ton, Crow Wing County, Minn. Annual cap. of mines, 300,000 tons.

AMERICAN MANGANESE STEEL CO., Chicago Heights, Ill.

Inc. May, 1910 in Maine. Capital stock: com. auth. \$2,000,000, issued \$1,931,700; pref. 7% non-cum. auth. \$3,000,000, issued \$2,693,900.

W. G. Nichols, P.; W. S. McKee, V. P.; S. T. McCall, V. P., Sc. & T.; M. B. Myers, G. S. M.; N. C. Peebles, P. A.; at McCormick

Bldg., Chicago. Charles Fahlstrom, A.; at Chicago Heights. R. Ortmann, Ch.; J. S. Thompson, V. P.; at 30 Church St., New York, N. Y.

Sales offices:

Chicago, McCormick Bldg. (General Sales Office).
 Denver, Herr, Rubincam Supply Co., First National Bank Bldg.
 Los Angeles, Otto F. Schaeffer, 951 North Main St.
 Nelson, B. C., Nelson Iron Works, Ltd.
 New Liskeard, Ont., Wabi Iron Works.
 New York, 30 Church St. (Eastern Sales Office).
 Pittsburgh, Pa., Oliver Bldg.
 Portland, Ore., Maeder Steel Products Co., 617 Vaughn St.
 Salt Lake City, (Western Sales Office).
 Seattle, J. D. Hull, Colman Bldg.
 Spokane, Hofius-Ferris Equipment Co., 17 South Washington St.
 Vancouver, British Columbia Equipment Co.
 Wallace, Idaho, Coeur d'Alene Hardware & Foundry Co.
 Brands: "Stag," "M," "E," "B B" and "A M S Co."

Product: manganese steel castings for railway frogs, crossings, switches, machinery, etc.

Plant "A," Chicago Heights, Ill.: blt. 1899-1900; 5 Tropenas converters (four 2-ton, one 1-ton); 9 special hearth fur.; 2 cupolas. Fuel, coke and oil. **Product:** manganese steel castings for sale; annual cap., 5,500 tons converter, 4,500 tons special furnace castings.

Plant "B," New Castle, Del.: blt. 1908-09; f. o. Mar. 25, 1909; 2 Tropenas converters (2-ton); 2 cupolas (1 for pig iron, 1 for ferro-manganese). Fuel, coal, coke and oil. **Product:** manganese steel castings for sale; annual cap., 3,000 tons.

Plant "C," New Castle, Del.: blt. 1903-04; f. o. Sept. 22, 1904; 4 Tropenas converters (3-ton); 3 special hearth fur.; 3 cupolas (2 for pig iron, 1 for ferro-manganese). Fuel, coal, coke and oil. (Formerly owned by the Brylgon Steel Casting Co.; acquired by the American Manganese Steel Co., May 26, 1916.) **Product:** manganese steel castings for sale; annual cap., 3,000 tons converter, 2,000 tons special hearth castings.

Plant "F," Oakland, Cal.: blt. 1918; f. o. Aug., 1919; 1 Heroult electric fur. (3-ton). Fuel, electricity. **Product:** manganese steel castings for sale; annual cap., 3,000 tons.

Total annual cap. of 4 steel castings plants, 21,000 tons.

AMERICAN METALLURGICAL CORPORATION, Franklin Trust Bldg., Philadelphia, Pa.

Inc. 1917 in Delaware. Capital stock: com. auth. \$250,000, issued \$64,000.

F. J. Ryan, P. & G. M.; S. R. Vanderbeck, V. P.; Winslow L. Taylor, T.; S. H. Ourbacker, Sc.; James L. Hawley, A. T.; John Gilispie, G. S.

Sales offices: San Francisco, Beekman & Linden, Balboa Bldg.; Birmingham, England, Midland Metallurgical, Ltd.

Works at Conshohocken, Pa.: 4 electric fur. (2 Rennerfelt, 500-lb. and 1-ton; 2 General Electric induction, one 500-lb., one 2,000-lb.). Plant equipped for metallurgical research and test work on steels, ferrous and non-ferrous alloys.

Product: steel castings, alloy steel ingots and castings for own use and for sale, annual cap., 2,280 tons ingots, 900 tons castings. Monel metal, brass and bronze castings, special iron alloys, silicon tubes, and heat resistive metals.

AMERICAN RADIATOR CO., 816 South Michigan Ave., Chicago, Ill.
Inc. Feb. 10, 1899 in New Jersey. Capital stock: com. auth. \$22,000,000, issued \$12,278,400; pref. 7% cum. \$3,000,000.

Clarence M. Woolley, P.; Charles H. Hodges, 1 V. P.; Clarence Carpenter, 2 V. P.; Charles K. Foster, V. P. & G. S. M.; William H. Hill, V. P. & T.; Archer A. Landon, V. P. & G. S.; Louis Bruch, V. P. in charge of Advertising; Rolland J. Hamilton, Sc.; Martin J. Beirn, A. T.

Sales offices in all principal cities.

The American Radiator Co. has a number of plants for the manufacture of radiators and boilers and one plant at Buffalo for the production of steel and malleable iron castings.

Steel Plant, Buffalo, N. Y.: f. o. Sept., 1918; 3 Greaves-Etchells electric fur. (two 6-ton and one 1-ton); 1 Moore electric fur. (3-ton). Fuel, electricity.

Product: steel ingots and steel castings for sale and own use, annual cap., 21,500 tons steel castings; malleable iron castings for sale and own use, annual cap., 15,000 to 18,000 tons.

AMERICAN ROLLING MILL CO. (The), Middletown, Ohio.

Inc. 1899 in New Jersey; reinc. June, 1917 in Ohio.

Capital stock: com. auth. \$20,000,000, issued \$9,900,975; pref. auth. \$21,500,000, issued \$7,000,000.

George M. Verity, P. & G. M.; Charles R. Hook, V. P. & A. G. M.; R. C. Phillips, Sc. & T.; C. W. Davis, A. T.; W. C. MacNeille, C. & A. T.; M. E. Danford, G. S.; G. F. Ahlbrandt, G. S. M.; H. O. Miller, P. A.; at Middletown. J. H. Frantz, V. P.; at Columbus.

Sales offices:

Atlanta, C. C. Lynd, 323 Healey Bldg.

Buffalo, George W. Donovan, 401 Niagara Life Bldg.

Chicago, F. B. Milhoan, 1288 People's Gas Bldg.

Cincinnati, J. A. Henry, 1402 Union Trust Bldg.

Cleveland, H. D. Cushman, 1101 Sweetland Bldg.

Detroit, R. C. Todd, 1820 Dime Bank Bldg.

New York, C. M. Spear, 50 Church St.

Philadelphia, W. S. Stephenson, Widener Bldg.

Pittsburgh, H. A. Lord, Oliver Bldg.

St. Louis, E. M. Johnston, 1120 Third National Bank Bldg.

San Francisco, H. O. Stevens, 10th & Bryant Sts.

Products: basic and malleable pig iron; steel ingots; slabs, sheet bars, billets; black and galvanized sheets, alloy coated sheets; automobile and electric sheets; American ingot iron and steel castings.

Brands: "Buckeye" for pig iron; "ARMCO", "American Ingot Iron."

Blast Furnaces, Columbus, Ohio: 2 stacks, each 75' x 18'; one blt. 1900 and blown in Oct., 1900; the other blt. 1900-01 and blown in Feb., 1901; 8 Foote stoves, 90' x 18'; 5 steam blowing eng. (73,500 cfm.); 6 water-tube boilers, 3,600 H. P.; 2 Uehling single-strand pig casting machines; 1 Plock sintering plant for flue dust and pyrites, annual cap., 20,000 tons; 2 granulating pits, annual cap., 100,000 tons. By-product coke: Lake ore. (Formerly owned by The Columbus Iron and Steel Co.; acquired by The American Rolling Mill Co., July 2, 1917.) Product: basic and malleable pig iron; annual cap., 200,000 tons.

East Side Works, Middletown: blt. 1911; 8 B. O. H. fur. (four 65-ton; four 85-ton); first steel made Sept. 10, 1911; 24 Hughes gas prod.; six 4-hole soaking pits; 40" 2-h. 1-st. reversing blooming mill; 24" bar with 24" 3-h. 2-st. and 24" 2-h. 1-st. bullhead; 4 heat. fur.; 9 pair and 9 sheet fur.; 3 jobbing plate mills (30" x 48" to 68" 2-h. roughing and 30" x 68" 3-h. finishing; 30" x 38" up to 48" 2-h.; 30" x 38" 2-h.); 9 sheet mills, 30" x 34" to 30" x 54"; 11 single stand cold mills (six 26" x 48", four 26" x 58", one 26" x 66"); 4 open annealing fur.; 28 box annealing fur.; 1 Mesta pickling machine; 7 galvanizing pots, annual cap., 75,000 tons; 1 alloy coating pot, annual cap., 7,500 tons. Fuel, coal, prod. gas and nat. gas. Building 8 additional sheet mills 30" x 40" to 30" x 56"; 3 double pair, 2 single pair and 8 sheet fur.; 10 single stands cold mills, 26" x 58"; to be completed about March, 1920, annual cap., 55,000 tons. Product and annual cap.: ingots (300,000 tons); sheets (100,000 tons), galvanized and alloy coated sheets (82,500 tons).

Central Works, Middletown: blt. 1899; f. o. Feb. 7, 1900; 4 B. O. H. fur. (three 50-ton, one 25-ton); 4 pair and 4 sheet fur.; 4 black sheet mills (two 30" x 38" to 30" x 48" and two 28" x 38" to 28" x 34"); 2 single stand cold sheet mills, 26" x 40"; 11 box annealing fur. Fuel, nat. gas, powd. coal and crude oil. Steel foundry; ingot iron castings for galvanizing equipment, flue boxes, gears, etc., for own use and for sale. Product and annual cap.: ingots (105,000 tons), steel castings (6,000 tons), sheets (20,000 tons).

Zanesville Works, Zanesville, Ohio: blt. 1900-1; f. o. Oct. 16, 1901; 8 sheet and 8 pair fur.; 8 black sheet mills (two 29" x 34", four 29" x 38" and two 29" x 44"); 5 cold mills (three 27" x 50", one 27"

x 40" and one 27" x 56"); 16 box annealing fur.; 1 Mesta pickling machine. Building 4 additional sheet mills, 30" x 34" to 30" x 48"; 2 double pair fur., 4 double sheet fur.; 4 annealing fur.; 2 single stands cold rolls, 30" x 48". Fuel, nat. gas and coal. Product and annual cap.: black sheets, 40,000 tons.

The company owns stock interest in iron ore mining properties on the Gogebic and Mesabi ranges.

The company leases the Marting Mine, Marting, Fayette Co., W. Va., annual cap., 200,000 net tons coal; also owns stock interest in the Portsmouth Solvay Coke Co., Portsmouth, Ohio, which operates 108 Semet-Solvay by-product coke ovens with an annual cap. of 450,000 net tons. Limestone quarries at West Columbus, Ohio are leased to the Marble Cliff Quarries Co.

AMERICAN SHEET & TIN PLATE CO., Frick Bldg., Pittsburgh, Pa.

Inc. Mar. 28, 1900 as American Sheet Steel Co., name changed to American Sheet & Tin Plate Co., Dec. 31, 1903. Subsidiary of the United States Steel Corporation.

E. W. Pargny, P.; S. A. Davis, V. P.; H. B. Wheeler, Sc. & T.; G. M. McGinnis, A.; R. J. Hadly, Asst. A.; J. I. Andrews, G. S. M.; M. S. Dennis, P. A.

Sales offices:

Chicago, W. H. Eaton, Cont. & Com. Natl. Bank Bldg.

Cincinnati, W. T. Shannon, Union Trust Bldg.

Denver, E. M. Sparhawk, First National Bank Bldg.

Detroit, J. A. Smith, Jr., Dime Savings Bank Bldg.

New Orleans, S. W. Wheelock, Maison Blanche.

New York, T. A. Gessler, Hudson Terminal Bldg.

Philadelphia, T. W. Simpers, Widener Bldg.

Pittsburgh, J. R. Bates, Frick Bldg.

St. Louis, O. J. Willis, Third National Bank Bldg.

Brands: "Apollo Best Bloom," "Keystone" copper bearing steel sheets and terne plates.

Product: black sheets, blue annealed sheets, galvanized sheets, flat and formed; painted and formed roofing, siding, etc.; cold rolled, blued, polished and automobile sheets; black plate for forming, stamping, enameling, etc.; black plate specialties; black plate for tinning, tinplates and terne plates.

SHEET MILLS.

Ætna-Standard Works, Bridgeport, Ohio: blt. 1872; three 4-d. slab heat. fur., 7 gas. prod.; one 3-h. sheared plate mill with 30" x 78" roughing and 30" x 72" finishing stands; one 2-h. jobbing mill with 29" x 72" roughing and 28" x 60" finishing stands. Sheet mills and galvanizing dept. formerly in this plant, dismantled.

Product: light plates and black sheets, annual cap., 32,400 tons sheared plates, 13,400 tons black sheets.

Dover Works, Dover, Ohio: blt. 1865-66; 6 sheet, 6 pair and 5 comb. sheet and pair fur.; 11 hot black sheet mills (two 28" x 34", five 28" x 38", one 28" x 42", three 28" x 48"); 2 stands cold rolls on hot mill train (24" x 48" and 24" x 52"), 3 stands cold rolls on cold mill train, each 24" x 48"; 12 box annealing fur.; 4 pickling mach.; 3 galvanizing pots. Fuel, coal. Product: black sheets; galvanized sheets, flat and formed; painted and formed roofing, siding, etc.; cold rolled, blued and automobile sheets; sheets for stamping, enameling, etc.; annual cap., 57,200 tons black sheets, 40,800 tons galvanized sheets.

Gary Sheet Mill, Gary, Ind.: blt. 1910-11, f. o. June 1, 1911; six 5-d. plate mill slab heat. fur., four 4-d. job mill slab heat. fur., four 2-d. job mill rehear. fur., 10 gas prod.; two 3-h. sheared plate mills, 32" x 84"; four 3-h. jobbing plate mills (one 32" x 44", two 32" x 56", one 32" x 72"); 8 sheet, 8 pair and 8 comb. sheet and pair fur.; 16 hot black sheet mills (three 32" x 36", seven 32" x 40", two 32" x 44", two 32" x 48", two 32" x 56"); 17 stands cold rolls (seven 26" x 44", two 26" x 56", three 26" x 66", one 26" x 40", two in two tandem 26" x 56", two in two tandem, 26" x 66"); 34 box annealing fur.; 15 pickling mach., 1 hand pickling tank; 10 galvanizing pots. Fuel, coal and prod. gas. Product: light plates, black sheets, blue annealed sheets; galvanized sheets, flat and formed; painted and formed roofing, siding, etc.; cold rolled, blued and automobile sheets; sheets for stamping, enameling, etc.; annual cap., 116,000 tons sheared plates, 216,000 tons black sheets, 155,200 tons galvanized sheets.

Guernsey Works, Cambridge, Ohio: blt. 1889-90, f. o. July, 1890; 3 sheet, 3 pair, 8 comb. sheet and pair fur.; 11 hot black sheet mills (one 26" x 38", one 26" x 34", five 28" x 38", four 28" x 44"); 6 stands cold rolls on hot mill train (one 24" x 44", four 24" x 48", one 26" x 48"); 10 box annealing fur.; 7 pickling mach.; one hand pickling tank; 8 galvanizing pots. Fuel, coal. Product: black sheets, galvanized sheets, flat and formed; formed roofing, siding, etc.; annual cap., 53,700 tons black sheets, 100,600 tons galvanized sheets.

Hyde Park Works, Hyde Park, Pa.: blt. 1895, f. o. Sept. 1, 1895; 6 comb. sheet and pair fur.; 6 hot black sheet mills (five 26" x 41", one 26" x 45"); three cold mills on hot mill train (24" x 42", 24½" x 45", 25" x 45"); 7 box annealing fur. Fuel, coal. Product: black sheets, annual cap., 24,000 tons.

Leechburg Works, Leechburg, Pa.: blt. 1872; 11 comb. sheet and pair fur.; 11 hot black sheet mills (two 24½" x 39", four 26" x 41", three 28" x 41", two 28" x 45"); 5 stands cold rolls on hot mill train (one 24½" x 45", one 26" x 45", two 26" x 50", one 26" x

54"); 7 box annealing fur. Fuel, coal. Product: black sheets, annual cap., 49,300 tons.

Mercer Works, Farrell, Pa. (owned by Union Steel Co.; operated by American Sheet & Tin Plate Co.): blt. 1901-3; 8 sheet and 8 pair fur., 12 gas producers; 8 hot black sheet mills (three 28" x 38", three 28" x 44", one 28" x 48", one 28" x 54"); 2 stands cold rolls on hot mill train (24" x 48", 24" x 54"); 8 stands cold rolls on cold mill train (six 24" x 54", two 24" x 48"); 14 box annealing fur.; 2 pickling mach.; 2 hand pickling tanks. Fuel, coal and prod. gas. Product: black sheets; cold rolled, blued and automobile sheets; sheets for stamping, enameling, etc.; annual cap., 43,500 tons black sheets.

New Philadelphia Works, New Philadelphia, Ohio: two 4-d. slab heat. fur., 3 gas prod.; two 2-h. jobbing plate mills 30" x 60" and 30" x 68"; 2 sheet, 2 pair and 8 comb. sheet and pair fur.; 10 hot black sheet mills (one 28" x 38", seven 28" x 42", two 30" x 54"); 8 stands cold rolls (five 24" x 44", two 26" x 60", one 24" x 48"); 9 box annealing fur.; 2 pickling mach.; two hand pickling tanks. Fuel, coal and prod. gas. Product: light plates, black sheets, blue annealed sheets; cold rolled, blued and automobile sheets; sheets for stamping, enameling, etc.; annual cap., 78,800 tons sheared plates and black sheets.

Old Meadow Works, Scottdale, Pa.: blt. 1898; 8 sheet and 8 pair fur.; 8 hot black sheet mills (three 26" x 38", one 26" x 44", one 26" x 50", one 28" x 38", two 28" x 44"); 2 stands cold rolls on hot mill train (26" x 44" and 26" x 50"); 7 box annealing fur.; 4 hand pickling tanks. Fuel, coal. Product: black sheets, cold rolled, blued and automobile sheets; annual cap., 39,700 tons black sheets.

Scottdale Works, Scottdale, Pa.: blt. 1873; 4 sheet, 3 pair and 6 comb. sheet and pair fur.; 9 hot black sheet mills (two 26" x 38", three 26" x 42", two 26" x 44", one 23" x 36", one 23" x 42"); 5 stands cold rolls on hot mill train (one 24" x 44", four 24" x 50"); 6 box annealing fur.; 6 pickling mach.; 7 galvanizing pots. Fuel, coal and nat. gas. Product: black sheets: galvanized sheets, flat and formed; formed roofing, siding, etc.; cold rolled, blued and automobile sheets; sheets for stamping, enameling, etc.; annual cap., 45,000 tons black sheets, 139,900 tons galvanized sheets.

Vandergrift Works, Vandergrift, Pa.: blt. 1895-96, f. o. Oct., 1895; six 35-ton B. O. H. fur.; six 35-ton A. O. H. fur.; four 4-hole soaking pits; 34" 2-h. 1-st. blooming; two 16" 2-h. 3-st. bar mills; 9 sheet, 4 pair, 3 double pair, 27 comb. sheet and pair fur.; 29 single and 3 double hot black sheet mills (five 28" x 36", twelve 28" x 41", six 28" x 45", five 32" x 46", two 32" x 54", two 32" x 60"); 13 stands cold rolls on hot mill train (two 26" x 45", four 26" x 49", three 28" x 53", four 28" x 65"); 50 box annealing fur.;

20 pickling mach., 4 hand pickling tanks; 16 galvanizing pots; 4 tinning pots for long terne plates. Fuel, coal and prod. gas. Sulphuric acid plant. Product: ingots, sheet bars; black sheets; galvanized sheets, flat and formed; formed roofing, siding, etc.; cold rolled, blued and automobile sheets, sheets for stamping, enamelling, etc.; long terne plates; annual cap., steel ingots (128,300 tons basic, 147,700 tons acid); sheet bars 237,000 tons; black sheets 192,600 tons, galvanized sheets 183,700 tons, long ternes 47,800 tons, sulphuric acid 23,200 net tons.

Wellsville Works, Wellsville, Ohio: blt. 1873; 10 sheet and 10 pair fur.; 10 hot black sheet mills (four 28" x 34", two 28" x 40", one 28" x 42", two 28" x 44", one 28" x 54"); 3 stands cold rolls on hot mill train (one 24" x 48", two 24" x 56"); 11 stands cold rolls on cold mill train (seven 24" x 38"; two sets 2 tandem 24" x 48"); 30 box annealing fur.; 6 hand pickling tanks. Fuel, coal. Product: black sheets, cold rolled, blued, polished and automobile sheets; annual cap., black sheets, 50,000 tons; polished sheets, 15,000 tons.

Wood Works, McKeesport, Pa.: blt. 1851; 2 slab heat. fur., 9 gas prod.; 20" 2-h. 2-st. bar mill; one 3-h. sheared plate mill 24" x 56"; two 1-d., ten 2-d. and one 3-d. sheet fur.; fifteen 1-d. and one 4-d. pair fur.; 12 hot black sheet mills (nine 21" x 40", two 21" x 44", one 21" x 48"); 6 stands cold rolls (four 24" x 40", two 20" x 40"); 20 box annealing fur.; 2 pickling mach.; five 50-ton steam ham. (idle). Fuel, coal, prod. gas and nat. gas. Charcoal bloomary: 12 forge fires, 12 knobbling fires, one 40-ton ham. (idle, not expected to resume). Product: sheet bars, light plates, black sheets, blue annealed sheets; cold rolled, blued and automobile sheets; sheets for stamping, enamelling, etc.; annual cap., 35,700 tons sheet bars, 23,600 tons sheared plates, 45,600 tons black sheets.

TIN MILLS.

American Works, Elwood, Ind.: blt. 1891-92, f. o. June, 1892; 20 sheet and 20 pair fur.; 9 double, 2 single, hot tin mills (nine 28" x 34" roughing, nine 28" x 36" finishing, two 28" x 34"); 18 stands cold rolls, 3 tandem (twelve 22" x 32", three 22" x 41", three 22" x 50"); 12 stands cold rolls, 2 tandem (eight 22" x 32", one 20" x 41", three 22" x 41"); 5 box annealing fur.; 6 pickling mach.; 50 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, tinplates, sulphate of iron; annual cap., 80,000 tons black plate, 1,809,400 base boxes tinplates, 4,800 net tons sulphate of iron.

Cambridge Works, Cambridge, Ohio: blt. 1894, f. o. Dec. 26, 1894; 8 sheet and 8 pair fur.; 8 hot tin mills (five 26" x 32", one 28" x 36", two 28" x 38"); 10 stands cold rolls, (two sets 2 tandem 22" x 36", three 22" x 40", two 22" x 36", one 22" x 48"); 8 box

- annealing fur.; 2 pickling mach. Fuel, coal. Product: black plate specialties, annual cap., 34,600 tons.
- Chester Works, Chester, W. Va.: blt. 1899-1900, f. o. Dec., 1901; 8 sheet and 8 pair fur.; 8 hot tin mills (one 28" x 30", four 28" x 32", three 28" x 36"); 10 stands cold rolls 2 tandem (eight 22" x 40", one 22" x 52", one 26" x 52"); 4 box annealing fur.; 2 pickling mach.; 14 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, black plate specialties, tinplates; annual cap., 35,200 tons black plate, 764,800 base boxes tinplates.
- Crescent Works, Cleveland, Ohio: blt. 1894-95, f. o. June 1, 1895; 6 sheet and 6 pair fur.; 6 hot tin mills (three 27" x 28", two 28" x 32", one 28" x 34"); 8 stands cold rolls 2 tandem (four 22" x 34", two 22" x 36", two 22" x 40"); 2 box annealing fur.; 2 pickling mach.; 13 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, 26,900 tons; tinplates, 582,300 base boxes.
- Farrell Works, Farrell, Pa. (owned by Sharon Tin Plate Co.): blt. 1900-01, f. o. May 16, 1901; 32 sheet and 30 pair fur.; 25 gas prod.; 22 single, 4 double hot tin mills (seven 27" x 29", sixteen 28" x 34", two 28" x 36", one 28" x 32"); 27 stands cold rolls, 3 tandem (twenty four 22" x 36", three 22" x 42"); 14 box annealing fur.; 6 pickling mach.; 46 tinning sets, for coke tinplates. Fuel, prod. gas and coal. Product: black plate for tinning, annual cap., 111,400 tons; tinplates, 2,416,800 base boxes, sulphate of iron, 7,800 net tons.
- Gary Tin Mill, Gary, Ind.: blt. 1916, f. o. Dec., 1916; 48 sheet and 48 pair fur.; 10 gas prod.; 24 double hot tin mills (one 28" x 30", twenty-two 28" x 34", one 28" x 42"); 42 stands cold rolls, 3 tandem (thirty 24" x 36", twelve 24" x 44"); 17 box annealing fur.; 7 pickling mach.; 92 tinning sets for coke tinplates. Fuel, coal and prod. gas. Product: black plates for tinning, annual cap., 186,200 tons; tinplates, 4,198,200 base boxes.
- La Belle Works, Wheeling, W. Va.: blt. 1893, f. o. April, 1894; 10 sheet and 10 pair fur.; 10 hot tin mills (one 27" x 32", four 27" x 34", one 28" x 32", three 28" x 34", one 28" x 36"); 10 stands cold rolls, 2 tandem (four 22" x 40", six 24" x 40"); 4 box annealing fur.; 2 pickling mach.; 14 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, annual cap., 38,400 tons; tinplates, 686,300 base boxes.
- Laughlin Works, Martins Ferry, Ohio: blt. 1895, f. o. Aug., 1895; 23 sheet and 23 pair fur.; 23 hot tin mills (ten 26" x 32", eleven 28" x 34", two 28" x 36"); 24 stands cold rolls, 2 tandem (six 24" x 32", sixteen 24" x 40", two 24" x 48"); 7 box annealing fur.; 4 pickling mach.; 46 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, annual cap., 89,200 tons; tinplates, 1,968,700 base boxes.
- National Works, Monessen, Pa.: blt. 1897-98, f. o. Jan., 1898;

25 sheet and 25 pair fur.; 25 hot tin mills (one 26" x 32", fifteen 28" x 32", eight 28" x 34", one 28" x 36"); 18 stands cold rolls, 2 tandem (ten 23" x 34", eight 22" x 40"); 11 box annealing fur.; 4 pickling mach.; 47 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, annual cap., 94,000 tons; tinplates, 2,088,700 base boxes.

New Castle Works, New Castle, Pa.: blt. 1892-93, f. o. Oct., 1893; 22 sheet and 20 pair fur.; 20 hot tin mills (one 26" x 30", five 28" x 30", twelve 28" x 34", two 28" x 36"); 30 stands cold rolls, 3 tandem (fifteen 22" x 40", twelve 22" x 36", three 22" x 44"); 9 box annealing fur.; 4 pickling mach.; 36 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, annual cap., 78,400 tons; tinplates, 1,789,600 base boxes.

Pennsylvania Works, New Kensington, Pa.: blt. 1894, f. o. 1895; 22 sheet and 8 pair fur.; 8 hot tin mills (five 26" x 30", two 28" x 34", one 28" x 40"); 12 stands cold rolls, 3 tandem and one single (one 22" x 44", six 24" x 40", six 24" x 44"); 6 box annealing fur.; 2 pickling mach.; 13 tinning sets, 6 for coke, 7 for charcoal tinplates. Fuel, coal. Product: black plate for tinning, black plate specialties, annual cap., 32,600 tons; tinplates, 272,000 base boxes coke, 192,300 base boxes charcoal.

Pittsburgh Works, New Kensington, Pa.: blt. 1894, f. o. Dec., 1894; 8 sheet and 8 pair fur.; 8 hot tin mills (three 26" x 30", four 28" x 34", one 28" x 36"); 8 stands cold rolls, 2 tandem (24" x 40"); 2 box annealing fur.; 2 pickling mach.; 14 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, annual cap., 30,100 tons; tinplates, 672,600 base boxes.

Sabraton Works, Morgantown, W. Va.: blt. 1902-03; 10 sheet and 10 pair fur.; 10 hot tin mills (five 26" x 30", five 28" x 34"); 9 stands cold rolls 3 tandem, and 2 single (six 22" x 44", three 22" x 34", two single 22" x 44"); 5 box annealing fur.; 3 pickling mach.; 23 tinning sets (5 for coke tinplates, 18 for terne plates). Fuel, coal. Product: black plate for tinning, annua' cap., 42,400 tons; tinplates, 167,100 base boxes, terne plates, 702,600 base boxes.

Shenango Works, New Castle, Pa.: blt. 1897-98, f. o. April, 1899; 46 sheet and 40 pair fur.; 30 single 5 double hot t'n mills (six 26" x 30", six 28" x 30", twelve 28" x 34", nine 28" x 36", two 28" x 42"); 33 stands cold rolls, 3 tandem (fifteen 22" x 36", three 22" x 44", six 22" x 46", nine 24" x 36"); 16 box annealing fur.; 8 pickling mach.; 68 tinning sets for coke tinplates. Fuel, coal. Product: black plate for tinning, annual cap., 150,800 tons; tinplates, 3,483,800 base boxes.

MISCELLANEOUS PROPERTIES.

Roll and Machine Works, Canton, Ohio: Product: chilled rolls, sand rolls and iron castings, annual cap., 18,600 tons rolls and 3,600 tons castings.

The company owns or leases 1149 acres of coal lands located in Armstrong, Allegheny and Westmoreland Counties, Pa., and Tuscarawas and Belmont Counties, Ohio. It operates three coal mines. The company owns the McKeesport Terminal Railroad at McKeesport, Pa., and the Elwood, Anderson and Lapelle Railroad at Elwood, Ind.

Total annual cap.; 276,000 tons O. H. ingots, 272,700 tons sheet bars, 172,000 tons sheared plates, 908,800 tons black sheets, 620,200 tons galvanized sheets, 15,000 tons polished sheets, 1,030,200 tons black plate, 20,900,300 base boxes coke tinplates, 192,300 boxes charcoal tinplates, 702,600 boxes terne plates, 47,800 tons long terne plates, 23,200 net tons sulphuric acid, 12,600 net tons sulphate of iron, 18,600 tons rolls and 3,600 tons iron castings.

AMERICAN STEEL & TUBE CO., Lorain, Ohio.

R. T. J. Martin, G. M.

Works at Lorain: blt. 1907, f. o. Sept., 1910; 20" 3-h. 2-st. sheet bar mill; 24" x 44" 2-h. 2-st. jobbing sheet or plate mill.

Product: sheet bars, slabs, grooved plate, tie plates, and plates and sheets from 7 to 16 gage; annual cap., 25,000 tons bars, 7,500 tons light plates and sheets.

AMERICAN STEEL & WIRE CO. OF NEW JERSEY (The), Western Reserve Bldg., Cleveland, Ohio.

Inc. Jan. 13, 1899 in New Jersey. Subsidiary of the United States Steel Corporation.

William P. Palmer, P.; Wm. Thompson, A. P.; A. F. Allen, Sc. & A. T.; A. H. Garry, A.; E. E. Stone, G. P. A.; H. G. Baldwin, S. Order and Warehouse Dept.; at Cleveland. J. S. Keefe, V. P.; Frank Baackes, V. P. & G. S. A.; J. R. Thomas, T.; at Chicago. C. L. Miller, V. P. & G. S.; at Pittsburgh. R. R. Hampson, A. T.; at New York.

Sales offices:

Baltimore, W. H. Jennings, 32 South Charles St.

Birmingham, J. J. Gilmore, Brown-Marx Bldg.

Boston, A. F. Walker, 120 Franklin St.

Buffalo, E. A. Niven, 337 Washington St.

Butte, Mont., C. H. Lane, 19 West Granite St.

Chicago, Frank Baackes, G. S. A., D. A. Merriman and G. F.

Rummel, A. G. S. A., 208 South La Salle St.

Cincinnati, S. A. Felix, Union Trust Bldg.

Cleveland, A. T. Merriman, Western Reserve Bldg.

Denver, W. R. Abbott, First Natl. Bank Bldg.

Detroit, M. Whaling, Foot of 1st St.

Kansas City, Mo., J. M. Holloway, 324 Railway Exch. Bldg.

New York, T. H. Taylor, A. G. S. A., 30 Church St.

Philadelphia, Henry Rose, Widener Bldg.

Pittsburgh, W. L. Hirsch, Frick Bldg.

Oklahoma City, J. H. Egelston, State Natl. Bank Bldg.

St. Louis, O. B. Barrows, Third Natl. Bank Bldg.

St. Paul, H. S. Durant, Pioneer Bldg.

Salt Lake City, P. B. Garoutte, Walker Bank Bldg.

Worcester, Mass., C. M. Booth, 94 Grove St.

Product: bessemer and basic pig iron; bessemer and open hearth steel ingots; blooms, billets, slabs, sheared plates, wire rods; wire (plain, galvanized, tinned, coppered, etc.), wire nails, spikes and pole steps; turned and cold drawn shafting and machine screw stock, cold rolled flat steel; barbed wire, woven fencing and netting, wire rope and strand, springs, horseshoes and toe calks. Sulphate of iron. Chilled iron dies and iron and steel castings for own use. Plain copper wire and insulated wire and cables. By-product coke; tar and benzol products. Spelter; sulphuric and muriatic acid.

Allentown Works, Allentown, Pa.: blt. 1886; 2 cont. billet heat. fur.; 5 gas prod.; Garrett rod mill with 16" 3-h. 1-st., 14" 2-h. 5-st. and 10" 2-h. 8-st.; 253 wire drawing blocks for wire $\frac{3}{8}$ " to 22 gage; 206 wire nail mach.; 148 barbed wire mach.; 3 galvanizing pans. Fuel, coal and prod. gas. Product and annual cap.: 130,000 tons wire rods, 140,000 net tons plain wire, 66,000 net tons galvanized wire, 800,000 kegs wire nails, 90,000 net tons barbed wire, 3,500 net tons fence staples, 3,400 net tons wire hoops.

American Works, Cleveland, Ohio: blt. 1886; 3 cont. billet heat. fur.; 9 gas prod.; Garrett rod mill with 16" 3-h. 2-st., 12" 2-h. 3-st. and 9" 2-h. 8-st.; Morgan cont. rod mill with 13" 2-h. 5-st., 9" 2-h. 6-st., 10" 2-h. 10-st.; 2 cold rolling mach. (10" and 6"); 7,766 wire drawing blocks for wire $\frac{3}{4}$ " to 36 gage; 16 galvanizing pans; tinning fur. Fuel, coal, prod. gas, pulv. coal and nat. gas. Product and annual cap.: 140,000 tons wire rods, 72,000 net tons plain wire, 2,200 net tons galvanized wire, 6,200 net tons tinned wire.

Anderson Works, Anderson, Ind.: blt. 1889; 3 cont. billet heat. fur., 6 gas prod.; Garrett rod mill with 18" 3-h. 1-st., 18" 2-h. 1-st., 12" 2-h. 3-st., and 10" 2-h. 8-st.; 128 wire drawing blocks for wire from 1 to 19 gage; 166 wire nail mach., 53 barbed wire mach.; 5 wire fence mach.; 2 galvanizing pans. Fuel, coal and prod. gas. Product and annual cap.: 120,000 tons wire rods, 67,000 net tons plain wire, 37,000 net tons galvanized wire, 800,000 kegs wire nails, 30,000 net tons barbed wire, 15,700 net tons wire fencing, 3,500 net tons fence staples.

Anthony Works, Tecumseh, Mich.: 9 wire fence mach. Product and annual cap.; 10,000 net tons wire fencing.

Bluff St. Works, Joliet, Ill.: idle.

Braddock Works, Braddock, Pa.: blt. 1891; 2 cont. billet heat. fur., 4 gas prod.; Garrett rod mill with 18" 3-h. 1-st., 18" 2-h. 2-st., 16" 2-h. 2-st., 12" 2-h. 7-st. and 10" 2-h. 4-st.; 292 wire drawing

blocks for wire $\frac{3}{4}$ " to 20 gage. Fuel, coal and prod. gas. Product and annual cap.: 100,000 tons wire rods, 100,000 net tons plain wire.

Breaker Island Furnaces, Breaker Island, Troy, N. Y.: 3 blast furnaces, long idle, dismantled in 1917.

Central Furnaces and Emma Furnace Cleveland, Ohio: 5 stacks; "A," 97' 3" x 22', blt. 1900-1, f. o. Jan. 17, 1901, relined 1919; "B," 90' x 22', blt. 1881-82, last rebt. 1904, relined 1918; "C," 90' x 22', blt. 1887, rebt. 1904, relined 1918; "D," 95' x 22', blt. 1910-11, relined 1918; "E," blt. 1872, remod. 1904, relined 1916; 20 two-pass stoves (sixteen 100' x 22', four 80' x 22'); 11 steam blowing eng., 2 gas blowing eng. (230,800 cfm.); 40 water-tube boilers, 11,044 H. P., serve electric power plant also; 3 double-strand Uehling pig casting mach.; Dwight & Lloyd sintering plant for flue dust, annual cap., 90,000 tons; slag granulating pit. Molten metal to Newburgh Steel Works. Gray iron foundry, annual cap., 2,100 tons for own use. By-product and Conn. coke: Lake ore. Product: bessemer and basic pig iron, annual cap., 817,000 tons.

Coke Works, Cleveland, Ohio: 180 Koppers by-product coke ovens; annual cap., 765,000 net tons coke. By-product recovery plant; Carl Still benzol plant.

Central Works, Worcester, Mass.: 1,634 wire drawing blocks for wire from 4 to 34 gage; 68 wire nail mach.; 10 galvanizing pans. Product and annual cap.: 22,400 net tons plain wire, 15,000 net tons galvanized wire, 1,500 net tons tinned wire, 140,000 kegs wire nails.

Consolidated Works, Cleveland, Ohio: blt. 1890-91; 2 cont. billet heat. fur., 3 gas prod.; Garrett rod mill with 16" 3-h. 3-st., 12" 2-h. 5-st., 10" 2-h. 2-st., 9" 2-h. 4-st.; 167 wire drawing blocks for wire $\frac{1}{2}$ " to 16 $\frac{1}{2}$ " gage; 274 wire nail mach.; 64 barbed wire mach.; 11 wire fence mach.; 3 galvanizing pans. Fuel, nat. gas and prod. gas. Product and annual cap.: 120,000 tons wire rods, 95,000 net tons plain wire, 50,000 net tons galvanized wire, 1,200,000 kegs wire nails, 34,000 net tons barbed wire, 29,000 net tons wire fencing, 5,000 net tons fence staples.

Cuyahoga Works, Cleveland, Ohio: blt. 1907-08, f. o. Nov. 3, 1908; 5 cont. billet heat. fur., 2 cont. billet reheate. fur., 8 gas prod.; 17" 2-h. 8-st. cont. small billet mill; cont. rod mill with 12" 2-h. 6-st. and 10" 2-h. 10-st.; comb. cont. and double duo strip mill with 16" 2-h. 6-st. cont., 14" 3-st. double duo, 14" 2-h. 3-st.; comb. reversing and cont. strip mill with 26" 2-h. 1-st. reversing, 20" 2-h. 3-st. and 18" 2-h. 4-st. cont.; comb. cont. and single Belgian strip mill with 12" 2-h. 11-st. cont., 11" 2-h. 4-st. Belgian; 99 cold rolling mach. (one 24", twenty eight 18", two 16", two 12", thirty seven 10", ten 9", four 8 $\frac{1}{4}$ ", fifteen 8"); 400 wire drawing blocks for wire $\frac{7}{16}$ " to 20 gage; 28 barbed wire mach.; 4 galvanizing pans;

8 washer mach. Fuel, coal, prod. gas and coke oven gas. Product and annual cap.: 100,000 tons wire rods, 127,000 tons hot rolled strip, 100,000 net tons cold rolled strip, 110,000 net tons plain wire, 48,000 net tons galvanized wire, 15,000 net tons barbed wire, 28,000 net tons bale ties, 2,000 net tons strand, 27,400 kegs washers.

De Kalb East and West Works, De Kalb, Ill.: 320 wire drawing blocks for wire 1 to 20 gage; 166 wire nail mach.; 98 barbed wire mach.; 27 wire fence mach.; 5 galvanizing pans. Product and annual cap.: 115,000 net tons plain wire, 56,000 net tons galvanized wire, 1,080,000 kegs wire nails, 55,000 net tons barbed wire, 32,000 net tons wire fencing, 7,300 net tons poultry netting, 3,500 net tons fence staples, 12,000 net tons concrete reinforcement, 4,500 net tons sulphate of iron.

De Kalb North and South Works, De Kalb, Ill.: 21 wire fence mach. Product and annual cap.: 25,000 net tons wire fencing, 22,400 net tons fence posts; 6,700 net tons poultry netting, 1,200 net tons concrete reinforcement.

Donora Steel Works, Donora, Pa. (owned by Union Steel Co.; leased to and operated by A. S. & W. Co.).

Donora Furnaces: 2 stacks, blt. 1902-04; No. 1, 85' 4½" x 22', f. o. Jan. 3, 1905, relined 1916; No. 2, f. o. Feb. 7, 1905, relined 1917 and 1919; 8 Kennedy two-pass stoves, 100' x 24'; 5 steam blowing eng. (115,000 cfm.); 16 water-tube boilers, 8,000 H. P., serve also electric power plant; 2 Heyl & Patterson double-strand pig casting mach.; Dwight & Lloyd sintering plant for flue dust, annual cap., 90,000 tons; 2 slag granulating pits (idle). Conn. coke: Lake ore. Foundry, annual cap., 1,800 tons for mill castings for own use. Product: basic pig iron, annual cap., 345,000 tons.

Open Hearth Dept.: blt. 1902-03, f. o. Feb. 7, 1905; two 25-ton Bessemer converters for duplexing only; 13 B. O. H. fur. (60-ton); 1,300-ton metal mixer; 2 cupolas for melting pig iron. Product: steel ingots and castings for own use, annual cap., 750,000 tons ingots, 600 tons castings. Rolling Mills: 6 four-hole soaking pits, 5 gas prod.; 40" 2-h. 1-st. blooming, 30" 3-h. 1-st. billet. Product and annual cap.: 640,000 tons blooms, billets and slabs.

Donora Wire Works, Donora, Pa. (owned by Union Steel Co.; leased to and operated by A. S. & W. Co.): blt. 1900-01, f. o. Sept., 1901; 7 cont. billet heat. fur., 9 gas prod.; 16" 2-h. 7-st. cont. roughing; 2 Garrett finishing rod mills with 12" 2-h. 9-st. and 10" 2-h. 2-st.; Garrett rod mill with 18" 3-h. 1-st., 16" 2-h. 2-st., 14" 2-h. 5-st. and 10" 2-h. 4-st.; 514 wire drawing blocks for wire 1½" to 20 gage; 346 wire nail mach.; 120 barbed wire mach.; 44 wire fence mach.; 8 galvanizing pans. Fuel, coal and prod. gas. Product and annual cap.: 355,000 tons wire rods, 224,000 net tons plain wire, 106,000 net tons galvanized wire, 1,520,000

kegs wire nails, 6,000 net tons galvanized nails, 69,000 net tons barbed wire, 60,000 net tons wire fencing, 21,000 net tons concrete reinforcement, 3,500 net tons fence staples, 10,000 net tons sulphate of iron.

Donora Zinc Works, Donora, Pa. (owned by Donora Zinc Co.; operated by A. S. & W. Co.): blt. 1915, f. o. Oct. 20, 1915; annual cap., 44,000 tons spelter, 112,750 tons sulphuric acid, 15,000 tons muriatic acid.

Fairfield Works, Fairfield, near Birmingham, Ala. (owned by American Steel & Wire Co. of Alabama; leased to and operated by A. S. & W. Co.): blt. 1910-14, f. o. Feb. 12, 1914; 2 cont. billet heat. fur., 3 gas prod.; double Belgian rod mill with 17" 2-h. 10-st. cont., 14" 2-h. 4-st. and 12" 2-h. 8-st. double Belgian; 264 wire drawing blocks for wire from 2 to 20 gage; 193 wire nail mach.; 56 barbed wire mach.; 38 wire fence mach.; 4 galvanizing pans. Fuel, prod. gas. Product and annual cap.: 120,000 tons wire rods, 115,000 net tons plain wire, 67,000 net tons galvanized wire, 1,000,000 kegs wire nails, 1,500 net tons galvanized nails, 32,000 net tons barbed wire, 78,000 net tons wire fencing, 5,600 net tons bale ties, 3,500 net tons fence staples, 4,500 net tons sulphate of iron.

Farrell Works, Farrell, Pa. (owned by Union Steel Co.; leased to and operated by A. S. & W. Co.): blt. 1900-01, f. o. May, 1901; 2 cont. billet heat. fur., 4 gas prod.; 2 Morgan cont. rod mills each with 10" 2-h. 14-st.; 210 wire drawing blocks for wire $\frac{1}{2}$ " to 20 gage; 280 wire nail mach.; 60 barbed wire mach.; 36 wire fence mach.; 4 galv. pans. Fuel, prod. gas. Product and annual cap.: 150,000 tons wire rods, 112,000 net tons plain wire, 67,000 net tons galvanized wire, 1,000,000 kegs wire nails, 35,000 net tons barbed wire, 39,000 net tons wire fencing, 1,500 net tons poultry netting, 22,400 net tons fence posts, 3,500 net tons fence staples, 3,400 net tons wire hoops.

H. P. Works, Cleveland, Ohio: blt. 1880; three 6-d. regen. billet heat. fur., 5 gas prod.; Garrett rod mill with 16" 3-h. 2-st., 12" 2-h. 3-st., 10" 2-h. 1-st., 9" 2-h. 7-st.; 190 wire drawing blocks for wire $\frac{3}{4}$ " to 25 gage; 839 wire nail mach. Galv. fur.; spike and pole step dept. Fuel, nat. and prod. gas. Product and annual cap.: 28,000 tons wire rods, 7,000 tons hot rolled strips; 67,000 net tons plain wire, 1,260,000 kegs wire nails, 9,000 net tons galvanized nails, 1,350 net tons staples and hooks; 100,000 kegs (200-lbs.) of spikes and pole steps.

Hamilton Works, Hamilton, Ont. (Canadian Steel & Wire Co., Ltd.): 6 barbed wire mach.; 10 wire fence mach. Product and annual cap.: 3,300 net tons barbed wire, 15,000 net tons wire fencing, 300 net tons fence staples, 10,000 net tons fence posts, 2,000 net tons bale ties.

New Haven Works, New Haven, Conn.: blt. 1899; 750 wire drawing

blocks for wire from 4 to 36 gage; 5 galvanizing pans; wire nail mach. transferred to Central Works. Product and annual cap.: 22,000 net tons plain wire, 5,000 net tons galvanized wire, 20,000 net tons wire rope and strand.

Newburgh Steel Works, Cleveland, Ohio: blt. 1867-68; two 15-ton Bessemer converters; 7 B. O. H. fur. (five 75-ton, two 50-ton); two 250-ton metal mixers; 4 cupolas for pig iron. Brass Foundry (150-tons). Two cont. billet heat. fur.; 10 soaking pits (7 one-hole, 2 four-hole, 1 eight-hole) with 11 gas prod.; 38" 2-h. 1-st. blooming, 35" 2-h. 1-st. blooming, 23" 3-h. 1-st. billet; Garrett rod mill with 18" 3-h. 1-st., 18" 2-h. 1-st., 12" 2-h. 3-st., 9" 2-h. 8-st. Fuel, coke oven and producer gas. Product and annual cap.: 970,000 tons ingots (720,000 tons bessemer, 250,000 tons open hearth); 870,000 tons blooms and billets, 120,000 tons wire rods.

Newburgh Wire Works, Cleveland, Ohio: 68 cold rolling machines (forty 10", one 9", four 8 $\frac{1}{4}$ ", six 8", fifteen 6", two 5"); 3,304 wire drawing blocks for wire 1" to 36 gage; 15 galvanizing pans. Product and annual cap.: 112,000 net tons plain wire, 56,000 net tons galvanized wire, 9,000 net tons tinned wire, 22,000 net tons cold drawn and turned bars, 17,000 net tons cold rolled flat steel, 8,200 net tons sulphate of iron.

North Works, Worcester, Mass.: 232 cold rolling mach. (61-10", 66-9", 33-8", 8-7", 64-6" and less); 5,897 wire drawing blocks for wire 1 $\frac{1}{8}$ " to .00225"; 20 galvanizing pans. Product and annual cap.: 65,000 net tons plain wire, 10,000 net tons galvanized wire, 8,000 net tons tinned wire, 29,000 net tons cold rolled flat steel, 5,000 net tons sulphate of iron.

Pacific Works, San Francisco, Cal.: 4 wire fence mach. Product and annual cap.: 8,400 net tons wire fencing, 2,200 net tons poultry and fish trap netting, 12,000 net tons wire rope, 600 net tons springs, 350 net tons bale ties, 200 net tons fence staples.

Rankin Works, Rankin, Pa.: blt. 1885-86; 2 cont. billet heat. fur., 6 gas prod.; Garrett rod mill with 18" 3-h. 1-st., 16" 2-h. 2-st., 14" 2-h. 2-st., 10" 2-h. 5-st., and 12" 2-h. 4-st.; 244 wire drawing blocks for wire from 2 to 20 gage; 222 wire nail mach.; 102 barbed wire mach.; 18 wire fence mach.; 4 galvanizing pans. Product and annual cap.: 140,000 tons wire rods, 150,000 net tons plain wire, 67,000 net tons galvanized wire, 1,340,000 kegs wire nails, 69,000 net tons barbed wire, 49,000 net tons wire fencing, 3,500 net tons fence staples.

Rockdale Works, Rockdale, Ill.: 440 wire drawing blocks for wire $\frac{3}{8}$ " to 21 gage; 161 wire nail mach.; 58 barbed wire mach.; 22 wire fence mach.; 6 galvanizing pans. Product and annual cap.: 135,000 net tons plain wire, 95,000 net tons galvanized wire, 112,000 kegs wire nails, 38,000 net tons barbed wire, 62,000 net tons wire fencing, 7,300 net tons poultry netting, 3,500 net tons fence staples, 5,000 net tons sulphate of iron.

Salem Works, Salem, Ohio: 62 wire drawing blocks for wire 2 to 20 gage; 249 wire nail mach. Product and annual cap.: 27,000 net tons plain wire, 520,000 kegs wire nails, 2,500 net tons galvanized nails.

Scott St. Works, Joliet, Ill.: 222 wire drawing blocks for wire $5\frac{1}{16}$ " to 17 gage; 234 wire nail mach.; 50 barbed wire mach.; 4 wire fence mach.; 3 galvanizing pans. Product and annual cap.: 123,000 net tons plain wire, 50,000 net tons galvanized wire, 1,280,000 kegs wire nails, 5,000 net tons galvanized nails, 30,000 net tons barbed wire, 15,000 net tons wire fencing, 9,000 net tons wire hoops, 3,500 net tons fence staples, 4,500 net tons sulphate of iron.

Shoenberger Works, Pittsburgh, Pa.: Shoenberger Furnaces; 2 stacks, blt. 1865; No. 1, relined 1919, 76' 6" x 16', No. 2 relined 1919, 76' $1\frac{1}{2}$ " x 14'; 8 Massicks & Crooke 3-pass stoves (one 85' x 18', three 75' 9" x 16' 6", one 76' $3\frac{1}{2}$ " x 18', three 57' 2" x 16' 6"); 5 steam blowing eng. (65,000 cfm.); 13 water-tube boilers, 5,218 H. P., serves plate mill and Bessemer dept. also; 2 revolving box type pig casting mach.; 2 slag granulating pits, annual cap., 75,000 tons. Conn. coke: Lake ore. Gray iron foundry for own use (600 tons). Product: bessemer pig iron, annual cap., 164,000 tons. Steel Works: two 7-ton Bessemer converters: 3 B. O. H. fur. (35-ton); two 150-ton metal mixers; 3 cupolas; three 5-hole, one 4-hole soaking pits with 8 gas prod.; 9 heat. fur. (two 3-d., six 4-d., one cont.); 36" 2-h. 1-st. blooming, 32" 2-h. 1-st. blooming, 16" 2-h. 6-st. cont. billet; 16" 2-h. 2-st. bar, 9" 3-h. 1-st. and 9" 2-h. 3-st. bar, 8" 3-h. 2-st. and 8" 2-h. 2-st. bar; sheared plate mill, 34" x 127" 3-h. Horseshoe machines. Fuel, oil, nat. gas and prod. gas. Product and annual cap.: 330,000 tons bessemer ingots, 84,000 tons open hearth ingots, 150 tons O. H. castings, 347,000 tons blooms, billets and slabs, 72,000 tons sheared plates, 30,000 tons horseshoe bars, 22,500 tons horseshoes, 1,500 tons toe calks.

South Works, Worcester, Mass.: blt. 1846; 3 B. O. H. fur. (50-ton); 4 A. O. H. fur. (one 50-ton, three 20-ton); Heroult electric fur. (15-ton) removed to Illinois Steel Co.; 7 cont. billet heat. fur.; six 1-hole soaking pits with 10 gas prod.; 34" 2-h. 1-st. blooming; 16" 2-h. 8-st. cont. billet; merchant mill with 16" 2-h. 1-st., 20" 2-h. 2-st., 16" 3-h. 3-st.; 11" to $8\frac{1}{2}$ " 2-h. 16-st. continuous rod mill; 10" 2-h. 15-st. cont. and single Belgian rod; 12" 2-h. 15-st. cont. and single Belgian rod; 613 wire drawing blocks for wire from $\frac{1}{2}$ " to .002"; 2 galvanizing pans. Fuel, coal and producer gas. Product and annual cap.: 180,000 tons ingots (95,000 basic, 85,000 acid), 700 tons steel castings; 157,000 tons blooms and billets; 138,000 tons wire rods, 23,000 tons strips, 4,000 tons merchant bars, 72,000 net tons plain wire, 10,000 net tons galvanized wire, 4,200 net tons tinned wire, 12,000 net tons springs, 23,000 net tons wire rope and strand, 24,600 net tons insulated wire and cable, 1,850 net tons rail bonds, 3,000 net tons sulphate of iron.

Trenton Works, Trenton, N. J.: blt. 1845; 2,007 wire drawing blocks for wire 2 to 36 gage; 1 galvanizing pan. Product and annual cap.: 30,000 net tons plain wire, 1,100 net tons galvanized wire, 800 net tons tinned wire, 12,000 net tons wire rope and strand.

Waukegan Works, Waukegan, Ill.: 4 cont. billet heat. fur., 10 gas prod.; 16" 2-h. 8-st. cont. small billet; 12" 2-h. 12-st. cont. rod; 12" to 9" 2-h. 12-st. Garrett rod mill; 12" to 9" 2-h. 16-st. double Belgian rod mill; 3,124 wire drawing blocks for wire $\frac{7}{8}$ " to 40 gage; 17 wire nail mach.; 18 barbed wire mach.; 16 wire fence mach.; 13 galvanizing pans. Fuel, prod. gas. Product and annual cap.: 225,000 tons wire rods, 191,000 net tons plain wire, 92,000 net tons galvanized wire, 9,000 net tons tinned wire, 100,000 kegs wire nails, 10,000 net tons barbed wire, 54,000 net tons wire fencing, 12,000 net tons springs, 31,000 net tons bale ties, 4,800 net tons galvanized strand, 1,350 net tons fence staples, 8,500 net tons sulphate of iron.

Total annual capacity: 1,326,000 tons pig iron, 2,314,000 tons ingots (1,050,000 tons bessemer, 1,179,000 basic open hearth, 85,000 tons acid open hearth), 1,450 tons steel castings (890 basic, 560 acid open hearth), 2,014,000 tons blooms, billets, and slabs, 72,000 tons sheared plates, 4,000 tons merchant bars, 30,000 tons horseshoe bars, 22,500 tons horseshoes, 1,500 tons toe calks, 22,000 net tons cold drawn and turned bars, 157,000 tons hot rolled strip, 146,000 net tons cold rolled flat steel, 27,400 kegs washers, 1,986,000 tons wire rods, 2,166,400 net tons plain wire, 900,300 net tons galvanized wire, 38,700 net tons tinned wire, 510,300 net tons barbed wire, 492,100 net tons wire fencing, 25,000 net tons poultry netting, 34,200 net tons concrete reinforcement, 54,800 net tons fence posts, 39,700 net tons fence staples, 15,800 net tons wire hoops, 66,950 net tons bale ties, 73,800 net tons wire rope and strand, 24,600 net tons insulated wire and cable, 24,600 net tons springs, 1,850 net tons rail bonds, 12,152,000 kegs wire nails, 24,000 net tons galvanized nails, 100,000 kegs spikes and pole steps, 53,200 net tons sulphate of iron, 44,000 net tons spelter, 112,750 net tons sulphuric acid, 15,000 net tons muriatic acid, 765,000 net tons coke.

AMERICAN STEEL CO., Park Bldg., Pittsburgh, Pa.

Inc. March 25, 1904 in Pennsylvania. Capital stock: com. \$1,500,000; pref. 7% cum. \$1,500,000.

M. B. Kelly, P. & G. M.; J. P. Kelly, V. P., T. & P. A.; J. A. McCrory, Sc. & G. S. M.

The company owns a rolling mill and tinplate works at Waynesburg, Pa.; wire and wire nail plant at Ellwood City, Pa.; and one half interest in the American Cotter Pin Co., Ellwood City, Pa.

Waynesburg Works, Waynesburg, Pa.: blt. 1900; f. o. Oct. 16, 1900; 4 sheet and 4 pair fur.; 4 tin mills (26" x 32"); 3 cold mills,

one 24" x 44", two 22" x 34"; two Mesta pickling mach.; four annealing fur.; 6 tinning stacks. Fuel, nat. gas.
 Product: black plate for tinning and tinplates; annual cap., 12,000 tons black plate, 220,000 base boxes tinplates.
 Ellwood City Works, Ellwood City, Pa.: 208 wire drawing blocks, 2 tinning frames; complete cold rolled flat wire equipment; annealing furnaces and mufflers; 60 nail machines.
 Product: wire, all grades from $\frac{3}{4}$ " to 30 gage; nails $\frac{1}{2}$ " x 18 gage to 8" x 1 gauge; annual cap., 50,000 tons plain wire, 360,000 kegs wire nails.
 American Cotter Pin Co. Capital stock \$250,000. Works at Ellwood City: 25 machines.

AMERICAN STEEL FOUNDRIES, 1163 McCormick Bldg., Chicago, Ill.

Inc. June 26, 1902 in New Jersey. Capital stock: com. auth. \$25,000,000, issued \$17,184,000; pref. 7% cum. auth. \$25,000,000, issued \$8,481,300.

Col. R. P. Lamont, P.; George E. Scott, 1 V. P.; R. H. Ripley, 2 V. P.; J. C. Davis, 4 V. P.; F. E. Patterson, Sc. & T.; William Epple, A. Sc. & A. T.; Thomas Drever, C.; at Chicago, Ill. W. J. Lynch, 3 V. P.; at 30 Church St., New York.

Sales offices:

Chicago, Ill.

Cleveland, Ohio.

Denver, Col., F. S. McNamara.

Houston, Texas, G. F. Cotter Supply Co.

Los Angeles, Cal., F. F. Bodler.

Mexico City, Mex., P. M. Armendariz.

New York City.

Philadelphia, Pa.

~Pittsburgh, Pa.

St. Louis, Mo.

St. Paul, Minn.

Washington, D. C.

Product: steel castings for locomotives, railway car castings, bolsters, couplers, side frames, draft arms, truck frames, steel car wheels, machinery castings, rolling mill rolls, castings for battleships, alloy steel castings; total annual cap., 310,000 tons.

STEEL CASTING WORKS.

Alliance Works, Alliance, Ohio: blt. 1883; since enl.; 7 B. O. H. fur. (six 20-ton, one 40-ton); 2 heat fur. (2-d. and 3-d. reverb.). Fuel, prod. gas. Product: bolsters, draft arms, couplers and other car castings for sale, annual cap., 72,000 tons.

East St. Louis Works, East St. Louis, Ill.: blt. 1900; f. o. June 14, 1900; 6 B. O. H. fur. (five 25-ton stationary, one 20-ton Wellman-Seaver rolling); 2 heat fur. (2-d. gas and 4-d. reverb.). Fuel, oil.

Product: car castings, bolsters, side frames, draft arms, couplers, etc., for sale, annual cap., 50,000 tons.

Franklin Works, Franklin, Pa.: blt., 1895; f. o. Dec., 1895; 2 A. O. H. fur. (one 15-ton, one 20-ton); 1 heat fur. (2-d. gas); 2 reverb. pit annealers. Fuel, nat. gas and oil. Product: locomotive, car and electric machinery castings for sale, annual cap., 11,000 tons.

Granite City Works, Granite City, Ill.: blt. 1894; enl. 1898; f. o. Nov., 1894; 6 B. O. H. fur. (25-ton); 7 heat. fur. (two 2-d. gas, one 3-d. gas, four 3-d. reverb.). Fuel, oil. Product: railway car castings, car wheels, for sale, annual cap., 78,000 tons.

Indiana Harbor Works, Indiana Harbor, Ind.: blt., 1903-04; f. o. June 29, 1904; 5 A. O. H. fur. (one 25-ton, two 20-ton, two 5-ton); 6-ton Heroult electric fur. added 1915; 3 reverb. pit heat. fur. Fuel, oil. Product: railway and misc. castings for sale, annual cap., 36,000 tons open hearth and 3,600 tons electric steel castings.

Pittsburgh Works, 36th St. & A. V. Ry., Pittsburgh, Pa.: blt. 1889; O. H. added 1895; 2 A. O. H. fur. (10-ton); 1 reverb. pit annealer. Fuel, nat. gas. Product: rolling mill, and misc. castings for sale, annual cap., 7,500 tons.

Sharon Works, Sharon, Pa.: blt., 1887; f. o. Aug. 26, 1887; 6 B. O. H. fur. (25-ton); 1 reverb. pit annealer. Fuel, pulv. coal and oil. Product: car truck frames, bolsters, car castings for sale, annual cap., 33,000 tons.

Simplex Works, Hammond, Ind.: blt. 1897. Product: railway car bolsters, brake beams, coil and elliptic springs, car and locomotive springs, roller side bearings, etc.

Thurlof Works, Chester, Pa.: blt. 1883-84; f. o. Mar., 1884; enl. 1890 and 1893; 3 A. O. H. fur. (25-ton); 2-d. reverb. heat. fur.; 2 pit annealers. Fuel, prod. gas and fuel oil. Product: castings for battleships, locomotives, alloy steel castings, machinery castings, annual cap., 22,500 tons.

On July 1, 1919, the American Steel Foundries acquired a controlling interest in the Griffin Wheel Co.

AMERICAN-SWEDO IRON CO., Harrison Bldg., Philadelphia, Pa.
Inc. Aug. 22, 1913 in Pennsylvania.

Thomas J. Price, P.; Danville, Pa. Frank Samuel, V. P.; Snowden Samuel, Sc. & T.; at Philadelphia.

Works at Danville, Pa.: blt. 1913-14; f. o. Feb. 10, 1914; 9 double puddling fur.; 19" 3-h. 1-st. muck mill. Fuel, bit. coal. (Formerly operated by Howe & Samuel, Inc.; acquired by American-Swedo Iron Co., Mar. 31, 1918.)

Product: low-phosphorus muck bar; annual cap., 8,000 tons.

AMERICAN TUBE AND STAMPING CO. (The), 471 Hancock Ave., Bridgeport, Conn.

Inc. 1899 in Connecticut. Capital stock: com. \$1,400,000; pref. 7% cum. \$1,400,000; bonds \$910,000.

J. V. W. Reynders, P.; at 120 Broadway, New York. F. Kingsbury Curtis, V. P.; at 30 Broad St., New York. E. C. Mayo, Sc. & G. M.; G. P. Miller, T.; C. E. Weeks, A. Sc. & C.; A. N. Wheeler, A. T.; C. M. Foote, G. S. M.; P. G. Puffer, P. A.; at Bridgeport. Sales offices: Detroit, L. D. Rockwell, 855 Book Bldg.; New York, George L. Anderson, 120 Broadway; Worcester, Mass., J. Adam Snyder, Park Bldg.
Brand: "Swedoh."

Works at Bridgeport: 4 B. O. H. fur. (three 40-ton, one 75-ton); 3 heat. fur. (2 cont. and one 5-d.); 7 gas producers; three 4-hole soaking pits; 34" 3-h. 1-st. blooming; 16" 2-h. 8-st. semi-cont.; 16" 3-h. 2-st. and 16" 2-h. 6-st. comb.; 12" 2-h. 7-st. merchant; cold rolling dept. with 8 stands 3" to 10", 6 stands 16", 6 stands 6" to 12" and 5 stands 14"; 9 box annealing fur.; 20 electric pickling tanks. Fuel, prod. gas.

Product and annual cap.: ingots (84,500 tons), steel castings (500 tons); blooms and billets (71,000 tons); hot rolled products (82,000 tons); cold rolled products (29,000 tons); stampings and deep drawn work.

American Vanadium Co., Pittsburgh, Pa., see 1916 Directory, p. 35, acquired by Vanadium Corporation of America, Sept., 1919.

AMERICAN WELL & PROSPECTING CO., Corsicana, Texas.

Inc. April, 1910 in Oklahoma. Capital stock: com. \$150,000; H. G. Johnston, P. & G. M.; Laura Rittersbacher, V. P.; Genevieve Johnston, Sc.; E. H. Akin, T.; P. C. Townsend, A. T. & A. Sales offices: Corsicana, Texas; Los Angeles, Cal.; Houston, Texas. Works at Corsicana, Texas: blt. 1901; first steel made Nov., 1916; 1 Snyder electric fur. (1,000-lb.). Fuel, nat. gas and electricity.

Product: steel castings for sale and for own use in manufacture of oil well machinery; annual cap., 200 tons.

AMES (W.) & CO., 417 Communipaw Ave., Jersey City, N. J.

Inc. July, 1908 in New Jersey. Capital stock: com. \$100,000; pref. 5% cum. \$200,000.

James W. Ames, P.; A. S. Ames, Sc. & T.; W. J. Onderdonk, P. A. Works at Jersey City: blt. 1909-10; 2 heat fur. (4-d. gas and 4-d. oil); 2 gas producers; Belgian train (13" 3-h. 1-st. roughing, 10" 3-h. 4-st. finishing); 16 heat fur. (twelve 1-d., four 2-d. oil-fired) for heating spike iron. Fuel, prod. gas and oil.

Product and annual capacity: merchant and concrete bars (1,000 tons); spike, bolt, nut, and splice bar rods (11,000 tons); railway spikes; boat and dock spikes, track bolts and machine bolts, also rail splice bars, tie rods (round and flat), hot pressed nuts and washers.

AMES SHOVEL & TOOL CO., Ames Bldg., Boston, Mass.

Capital stock: com. \$2,000,000; pref. \$3,000,000.

Hobart Ames, P.; Oliver Ames, V. P.; Oliver W. Mink, T.; Samuel S. Early, Sc.; at Boston. Julius C. Birge, V. P.; at St. Louis, Mo. The company owns or controls the following companies:

Oliver Ames & Sons Corp., North Easton, Mass.

T. Rowland's Sons, Inc., Cheltenham, Pa.

George Griffiths Co., Cheltenham, Pa.

H. M. Myers Co., Beaver Falls, Pa.

Wright Shovel Co., Anderson, Indiana.

St. Louis Shovel Co. Plant, St. Louis, Mo.

Product: shovels, spades, scoops and drainage tools; annual cap., 480,000 dozen.

Elwood Plant, Elwood, Ind.: blt. 1892; 4 heat. fur.; 4 gas prod.; 4 trains (two 16", two 22"). Fuel, gas and coal. Product: shovel plate for own use, annual cap., 6,000 tons.

Myers (The H. M.) Co. Plant, Beaver Falls, Pa.: blt. 1883; 8 heat. fur.; 4 trains (16"). Fuel, coal and coke. Product: rolled shovel blanks for own use, annual cap., 2,000 tons.

The company also owns and operates handle plants at Paris, Texas; Oakland and Cumberland Mills, Me.; Warren, Ohio; and Martinsville, Ind.

ANACONDA COPPER MINING CO., Anaconda, Montana.

Inc. July 1, 1895 in Montana. Capital stock: auth. \$150,000,000, issued \$116,562,500.

John D. Ryan, Ch.; C. F. Kelley, P.; B. B. Thayer, V. P.; D. B. Hennessy, A. T.; J. T. Roberts, A.; D. A. Welch, P. A.; at 42 Broadway, New York. R. D. Cole, A. Sc.; at Butte, Montana. Frederick Laist, G. M.; at Anaconda, Montana.

Sales agent: United Metals Selling Co., 42 Broadway, New York. Company engaged in mining and smelting copper and zinc ore. Built a plant in 1918 for smelting of local manganese ore.

Works at Great Falls, Montana: blt. 1918, f. o. 1918; 5 open top electric fur. Hydro-electric power from the Montana Power Co.

Product: ferro-manganese; annual cap., 20,000 tons.

Andrews and Hitchcock Iron Co. (The), Youngstown, Ohio, see 1916 Directory, p. 36. Was sold to the Youngstown Sheet and Tube Co., April 8, 1916.

ANDREWS STEEL CO. (The), 9th & Lowell Sts., Newport, Ky.

Inc. 1906 in Kentucky. Capital stock: com. \$750,000.

J. B. Andrews, P.; A. K. Andrews, V. P.; W. N. Andrews, Sc. & G. M.; A. L. Andrews, T.; V. I. Reed, A.; C. H. Sloan, G. S.; A. W. Hubbard, G. S. M.; R. K. Boggs, P. A.

Works at Newport: blt. 1906-08; f. o. April, 1908; 8 B. O. H. fur. (two 105-ton, three 85-ton, three 75-ton); 2 trains (36" 2-h. 1-st. blooming; 24" 2-h. 1-st., 3-h. 1-st. sheet bar); 12 soaking pits; 5 gas producers. Fuel coal, prod. and nat. gas.

Product: ingots, slabs, sheet and tinplate bars, billets, forging billets

and all kinds of alloy steel ingots. Annual cap., 250,000 tons ingots and 200,000 tons rolled products.

ANGLO-CANADIAN MALLEABLE STEEL MANUFACTURING CO., Ltd., P. O. Box 88, Rawdon, P. Q., Canada.

Inc. May 26, 1919 in Dominion of Canada. Capital stock: com. auth. \$50,000, issued \$39,500.

John Terreault, P.; S. J. Booth, V. P. & G. M.; Wilfred L. Burn, Sc., T. & G. S.; J. Holmes Brittle, A. & P. A.; at Rawdon. Thomas Mitchell, G. S. M.; at 16 Cathcart St., Montreal.

Sales agent: Yeates Machinery & Supply Co., New Birks Bldg., Montreal.

Works at Rawdon: four 8-pot crucible furnaces; 1 cupola, malleable iron foundry.

Product: crucible steel castings, tool steel; annual cap., 220 tons; malleable iron and malleable steel castings.

Anniston Ordnance Co., see 1916 Directory, p. 37, formerly operated plant at Anniston, Ala., then leased by and subsequently owned by Southern Munitions Corporation. Taken over by Anniston Steel Co., May 23, 1919.

ANNISTON STEEL CO., Anniston, Ala.

Inc. April 23, 1916 in Alabama. Capital stock: com. \$1,003,000. Thomas W. Martin, P.; W. H. Wells, V. P. & G. M.; at Birmingham, Ala. J. T. Raspberry, T.; B. F. Lively, Works M.; C. B. Wells, G. S. M.; R. C. Holley, P. A.; at Anniston.

Anniston Works, Anniston, Ala.: blt. 1884; rolling mill equipment abandoned and being dismantled; 5 Heroult electric fur. (6-ton); forge shop, foundry, structural steel shop for light fabricating, and machine shop. (Formerly operated by Anniston Ordnance Co.; acquired by Anniston Steel Co., May 13, 1919.)

Product: steel ingots and steel castings for own use and for sale; electric furnace pig iron; steel forgings, mine cars and oil field supplies (engines and heavy duty gate valves). Annual cap., 19,200 tons steel ingots.

ANTRIM IRON CO., Grand Rapids, Mich.

Inc. Mar. 5, 1886 in Michigan. Capital stock: com. \$350,000.

J. C. Holt, P. & T.; T. J. O'Brien, V. P.; H. J. Bennett, Sc.; at Grand Rapids. N. M. Langdon, M.; S. W. Katzenstein, A. M.; at Mancelona, Mich.

Sales office: Grand Rapids, Superior Charcoal Iron Co.

Brand: "Antrim."

Furnace at Mancelona, Mich.: 1 stack, 60' x 11' 6"; blt. 1887-88; last rebt. 1912; relined Aug., 1918; hot blast, one iron pipe stove; 2 steam blowing eng. (15,000 cfm.); 8 water-tube boilers, 1,300 H. P. Charcoal; Lake ore. Iron foundry for own use. Connected with furnace are 20 charcoal retorts, annual cap., 2,500,000 bushels charcoal, and plant for recovery of by-products.

Product: car wheel and malleable charcoal pig iron; annual cap., 30,000 tons.

Apollo Electric Steel Co., Apollo, Pa., see 1916 Directory, p. 37, bought by Apollo Steel Co., Apollo, Pa., Nov., 1918.

APOLLO STEEL CO., Apollo, Pa.

Inc. April 16, 1912 in Pennsylvania. Capital stock: com. \$300,000. A. M. Oppenheimer, P. & G. M.; O. W. Oppenheimer, T.; at 115 Seventh St., Pittsburgh. W. J. Guthrie, V. P.; at Frick Annex, Pittsburgh. C. L. Pollock, Sec. & G. S. M.; M. M. Crawford, A.; H. C. Shroyer, G. S.; George T. McCarthy, P. A.; at Apollo.

Sales offices:

Chicago, Theo. Geissman & Co., 332 South Michigan Blvd.

Cleveland, J. T. AuWerter, 811 Citizen Bldg.

New Orleans, J. C. Brill & Co., Queen & Crescent Bldg.

Philadelphia, H. M. Davis, 702 Lincoln Bldg.

San Francisco, A. W. Dow, Call Bldg.

Steel Works at Apollo: blt. 1916, f. o. Nov. 7, 1916; 2 B. O. H. fur. (one 100-ton, one 40-ton). (Formerly owned by Apollo Electric Steel Co.; acquired by Apollo Steel Co., Nov., 1918).

Rolling Mill at Apollo: blt. 1912-13; f. o. June 16, 1913; 8 comb. sheet & pair fur.; 8 sheet mills (one 28" x 36", five 28" x 40", one 28" x 42", one 28" x 46"); 3 cold mills (one 26" x 52", two 26" x 44"); 3 pickling machines; 6 box annealing fur.; 4 galvanizing pots, annual cap., 48,000 tons. Fuel, coal and gas.

Adding 2 jobbing mills (one 54", one 60") and 4 sheet mills (three 42", one 54") one roughing and one finishing stand to each mill; construction to begin Mar. 1, 1920, to be completed about Dec. 1, 1920; annual cap. of sheet mills, 30,000 tons, jobbing mills, 40,000 tons.

Product: steel ingots for own use; iron and steel black sheets, galvanized, flat and corrugated sheets; annual cap., 40,000 tons ingots, 60,000 tons black sheets, 48,000 tons galvanized sheets.

Armour Steel Co., Chicago, Ill., see 1916 Directory, p. 38; plant formerly operated by Riverdale Iron & Steel Co. and Chicago Riverdale Iron & Steel Co., acquired in 1917 by Riverdale Rolling Mill Co.

ARMSTRONG (G. W.) & CO., Inc., P. O. Box 1007, Ft. Worth, Texas.

Inc. 1908 in Texas. Capital stock: com. \$650,000; bonds \$105,000. George W. Armstrong, P.; Barney Smith, V. P. & G. M.; J. F. Foster, V. P.; G. W. Link, Sec., T. & A.

Fort Worth Works, Fort Worth: blt. 1904-05; 7 busheling fur.; 1 squeezer; 3 heat. fur. (two 6-d., one 4-d. reversible); 20" 3-h. 2-st. muck, 16" 3-h. 2-st. bar, 10" 3-h. 4-st. guide, 8" guide with 15" 2-h. 1-st. rail splitter, 10" 3-h. 1-st. roughing, 8" 3-h. 4-st. finishing. Fuel, oil. (Formerly owned by Texas Rolling Mill Co.; acquired by G. W. Armstrong & Co., Inc., May, 1916.)

Product: scrap bar, merchant bar, and concrete reinforcing bars;

annual cap., 20,000 tons scrap bar, 25,000 tons merchant and concrete bars. Oil well supplies.

Sand Springs Works, Sand Springs, Okla.: blt. 1911-12, f. o. Dec. 27, 1913; two 2-d. heat. fur.; 14" 3-h. 2-st. roughing, 10" 3-h. 4-st.

Belgian finishing. Fuel, nat. gas. (Formerly owned by Osage Iron & Steel Co.; acquired by G. W. Armstrong & Co., Jan., 1916.)

Product: merchant and concrete bars, annual cap., 10,000 tons.

ARMSTRONG, WHITWORTH OF CANADA, Ltd., 298 St. James St., Montreal, P. Q., Canada.

Inc. 1913 in Dominion of Canada. Capital stock: com. \$2,000,000.

A. W. Wheatley, P.; Lawrence Russell, Sc., T. & G. M.; G. W. Odell, C.; Herbert Johnson, G. S. M.; William Smith, P. A.; at Montreal. Brigadier General Sir E. P. C. Girouard, V. P.; 8 Great George St., Westminster, S. W., London. William Townsend, G. S.; at Longueuil.

Sales offices:

Hamilton, A. J. Reid, 27 King William St.

Toronto, J. L. Hynes, 126 Wellington St. West.

Winnipeg, J. T. Kelly, McArthur Bldg.

Works at Longueuil: blt. 1914-15; two 12-pot crucible fur.; f. o. 1915; four Herault electric fur. (one 3-ton, three 6-ton); 2 B. O. H. fur. (18-ton); rolling mill department, f. o. Jan. 3, 1915; 2 pile fur.; 1 welding fur.; 3 billet heat. fur.; 5 annealing fur. (muffle type); 4 forge fires; 2 punching and 2 planishing machines; 12" 2-h. 5-st. bar mill; 5 ham. (400-lb. to 3-ton); 6 cranes; 2 shears. Plant for the manufacture of locomotive and car wheel tires and rolled steel wheels. Machine shop for the manufacture of twist drills, reamers, milling cutters, shear blades, punches, taps and dies, etc. Fuel, bit. coal and coke.

Product: ingots and steel castings for sale and own use; carbon and high speed tool steel; steel hexagons, octagons, rounds and flats from $\frac{1}{4}$ " to 6"; also forged steel bars and special forgings. Annual cap., 1,050 tons crucible ingots, 15,000 tons electric steel ingots, 20,000 B. O. H. ingots, 10,000 tons rolled products, 10,000 tons forged products, twist drills, taps, milling cutters, special tools, locomotive tires, etc.

ARNESON FOUNDRY CO., Kenosha, Wis.

Ole A. Arneson, Owner. Company not incorporated.

Works at Kenosha: blt. 1914; f. o. Nov., 1914; 1 Whiting converter (2,400-lb.); 3 cupolas. Fuel, coke. Gray iron and brass foundry.

Product: castings for sale; annual cap., 3,000 tons steel, 9,000 tons gray iron, 50 tons brass, castings.

ASHLAND IRON & MINING CO., Ashland, Ky.

Inc. Oct. 15, 1901 in Kentucky. Capital stock: com. \$1,547,000; bonds \$1,375,000.

W. B. Seaton, P.; S. C. Peebles, V. P. & G. M.; F. B. Moore, Sc.

& T.; A. N. Richardson, A.; J. L. Meehan, G. S. M. for steel; A. J. McCullough, G. S. M. for sheets; G. C. McClure, P. A.
Brand: "Ashland."

Ashland Furnaces, Ashland, Ky.: 2 stacks, 75' x 17'; No. 1, f. o. Aug. 31, 1869, rebt. 1904-05, relined 1917; No. 2, f. o. Jan. 30, 1888, rebt. 1904-05, relined 1917; 8 hot blast stoves (four 75' x 18', two 65' x 18', one 85' x 18', one 90' x 20'); 4 steam blowing eng. (60,800 cfm.); 8 water-tube boilers, 4,400 H. P. furnish electric power also to other Depts.; 1 Pittsburgh Coal Washer Co. single-strand pig casting mach.; 1 Plock sintering plant for flue dust and scale; annual cap., 15,000 tons. By-product coke: Lake ore. 78 beehive coke ovens at furnace, dismantled 1918. Gray iron and brass foundry, annual cap., 3,000 tons; machine shop for jobbing and own use. Product: basic pig iron; annual cap., 180,000 tons.

Steel Plant: blt. 1916-17, f. o. Feb. 17, 1917; 6 B. O. H. (80-ton); four 4-hole soaking pits; 36" blooming mill. Product: steel ingots, annual cap., 270,000 tons; blooms, billets and slabs, 360,000 tons.

Ashland Sheet Mill: built 1900, f. o. 1901; 6 sheet and 6 pair fur.; 6 hot black sheet mills (three 33", two 36", one 44" and 48" comb.); 8 box annealing fur.; 1 pickling mach.; 1 hand pickling tank; 3 galvanizing pots. Fuel, nat. gas.

Product: black and galvanized sheets, annual cap., 25,000 tons.

ASHLAND STEEL CO., Ashland, Ky.

Inc. Aug. 20, 1890 in Kentucky. Capital stock: com. \$100,000. Thomas M. Adams, P.; L. R. Putnam, T., G. M. & G. S. M.; W. J. Bryan, G. S.; G. F. Parks, A. Sc. & P. A.; at Ashland, Ky. Oscar Richey, V. P.; S. G. Gilfillan, Sc.; at Ironton, Ohio.

Works at Ashland: blt. 1891; 2 Bessemer converters (5½-ton); f. o. Dec. 26, 1891; 4 cupolas; two 3-hole gas-fired soaking pits, 2 Laughlin cont. heat. fur.; 32" 2-h. 1-st. blooming mill; Garrett rod mill with 3 trains (16" 2-h. 7-st. cont., 12" 3-h. 5-st. Belgian, 10" 3-h. 6-st. Belgian). Fuel, coal and nat. gas. Foundry for gray iron and steel castings for own use (annual cap. 600 tons).

Product: billets, slabs, sheet and tinplate bars, and wire rods. Annual cap., 190,000 tons of ingots; 180,000 tons of slabs and billets; 100,000 tons of wire rods.

ATIKOKAN IRON CO., Ltd., Port Arthur, Ont., Canada.

Org. 1904, inc. April, 1905. Capital stock: com. and bonds \$1,000,000.

Sir Donald Mann, P.; R. P. Ormsby, Sc.; at Toronto, Ont. J. Dix Fraser, G. M.; A. J. Mackey, S. Works; F. Rodda, S. Mines; at Port Arthur, Ont.

Brand: "Atikokan."

Atikokan Furnace, Port Arthur: 1 stack, 80' x 16', blt. 1905-07, f. o. July 16, 1907; 3 Roberts-Cowper hot blast stoves, 70' x 18';

2 steam blowing eng. (32,000 cfm.) ; 4 water-tube boilers, 900 H. P. Coke: Atikokan ore. Company owns 100 bee-hive coke ovens located at the furnace, annual cap., 50,000 net tons; also owns the Atikokan iron ore mine 130 miles west of Port Arthur on Canadian Northern Ry., annual cap., 125,000 tons.

Product: foundry pig iron, annual cap., 45,000 tons.

Atlanta Tin Plate & Sheet Mill, Indianapolis, Ind., see 1916 Directory, p. 40. Works at Atlanta, Ind. Buildings and equipment sold in June, 1916 to Jacob D. Waddell. Plant dismantled and equipment removed to Mahoning Valley Steel Co., Niles, Ohio.

ATLANTIC COAST LINE RAILROAD CO., Wilmington, N. C.

Willard Kells, G. S. of Motive Power.

South Rocky Mount Shops, South Rocky Mount, N. C.: hot train added 1911; f. o. Oct. 19, 1911; 2 scrap heat. fur.; 12" 2-st. rolls, 1 splitting roll. Fuel, oil.

Product: iron rounds and flats for own use.

ATLANTIC FOUNDRY CO. (The), 182 Beaver St., Akron, Ohio.

Inc. June 22, 1905 in Ohio. Capital stock: com. auth. \$500,000, issued \$399,950.

Charles Reymann, P. & G. M.; Philip Willenbacher, 1 V. P.; Evald Erikson, 2 V. P.; Christian Franz, Sec.; John Steckel, T. & P. A.; John J. Ihrig, G. S.

Works at Akron: blt. 1918; one 3-ton Industrial electric fur. f. o. Sept. 28, 1918; 3 cupolas. The company also operates gray iron and semi-steel foundries at Akron, Ohio and Cuyahoga Falls, Ohio.

Product: steel castings for sale; also gray iron and semi-steel castings up to 25 tons; annual cap. 9,000 tons electric steel castings, 27,000 tons gray iron and semi-steel castings.

Atlantic Metals & Alloys Co., Inc., 43 Exchange Place, New York. Plant at Boonton, N. J.: one special 500-lb. electric fur. Product: ferro-molybdenum. Taken over by Tungsten Products Co. of Boulder, Col. in 1917 and dismantled in that year.

Atlantic Ore & Alloys Co., 352 Bullitt Bldg., Philadelphia, Pa. Works at 19th St. and Washington Ave., Philadelphia: electric fur. for manufacture of ferro-alloys; annual cap., 100 tons. Works closed. Company out of business.

ATLANTIC STEEL CASTINGS CO., 6th and Lloyd Sts., Chester, Pa.

Inc. Aug. 21, 1915 in Pennsylvania. Capital stock: com. auth. \$200,000, issued \$128,000; bonds \$54,000.

W. A. Farson, P.; Dudley Shoemaker, V. P.; T. J. Sproul, V. P.; T. E. Rodman, G. S. M.; James H. McShane, Sec. & T.

Sales agents: Baltimore Steel Co., Baltimore, Md.

Works at Chester: blt. 1907; f. o. July, 1907; 8-pot crucible fur.

for melting alloys dismantled 1915; 6-ton A. O. H. fur. Fuel, oil.
Product: steel ingots, steel castings for sale; gear blanks, fittings,
railroad, ship and motor castings; annual cap., 4,800 tons.

ATLANTIC STEEL CO., Atlanta, Ga.

Inc. 1915 in Delaware. Capital stock: com. auth. \$1,000,000,
issued \$1,000,000; pref. 7% cum. auth. \$750,000, issued \$700,000;
bonds \$661,000.

Thomas K. Glenn, P.; John H. Goddard, 1 V. P.; J. E. Murphy,
2 V. P.; E. Woodruff, 3 V. P.; Robert Gregg, Sc. & T.; N. C. Harrison,
G. S.; C. F. Stone, G. S. M.; G. W. Ramey, P. A.

Works at Atlanta: blt. 1901; f. o. June, 1901; first steel, May 10,
1906; three 60-ton B. O. H. fur.; 5 cont. heat fur.; four 2-hole
soaking pits; 5 trains (25" 2-h. 1-st. blooming, 14" 2-h. 6-st. Morgan
cont. billet, 10" 2-h. 12-st. Morgan semi-cont., 10" 2-h. and 3-h.
5-st. hoop, 8" 2-h. and 3-h. 5-st. hoop); 48 wire drawing blocks;
52 wire nail mach.; 2 automatic spike mach.; 20 barbed wire mach.;
4 wire fence mach.; 1 galv. pan. Fuel, prod. gas. and pulv. coal.
Product: ingots and castings for own use, 1½" to 4" billets, wire
rods, hoops, bands, cotton ties, bars, rounds, squares, plain wire
(1-17 ga.), galvanized wire, barbed wire, wire nails, railroad spikes,
etc.; annual cap., 100,000 tons of ingots; 80,000 tons of billets;
16,000 tons of wire rods, 12,000 tons merchant and concrete bars,
30,000 tons of hoops, bands, cotton-ties, etc.; 175,000 kegs (100
lbs.) of wire nails, 100,000 kegs (200 lbs.) of railroad spikes, 15,000
tons of plain wire, 6,000 tons barbed wire, 3,000 tons wire fencing
and 9,000 tons galvanized wire.

ATLAS CRUCIBLE STEEL CO., Dunkirk, N. Y.

Inc. 1912 in New York. Capital stock: com. \$2,000,000; pref.
7% cum. \$1,250,000.

Arthur H. Hunter, P.; A. F. Dohn, V. P. & G. M.; H. E. Nichols,
Sc. & T.; C. M. Kehr, A.; D. W. Lathrop, P. A.

Sales offices:

Boston	Cleveland	New York	San Francisco
Buffalo	Detroit	Philadelphia	St. Louis
Chicago	Minneapolis	Pittsburgh	

Works at Dunkirk: blt. 1907-08; first steel made Jan. 27, 1908;
first hammered products made Feb., 1908; first products rolled
Aug., 1913; 3 crucible fur. (30-pot); 1 B. O. H. fur. (20-ton);
2 Heroult electric fur. (6-ton and 3-ton); 19 heat fur. (eleven 2-d.
and eight 3-d.); 3 gas producers; 14" 3-h. 5-st., 10" 3-h. 7-st., and
10" 3-h. 5-st. bar mills; 7 steam hammers (1,200 to 12,000-lb.).
Fuel, coal and prod. gas.

Product: steel ingots; tungsten, chrome and vanadium alloy steel
ingots; hammered and rolled bars, squares, rounds, flats, octagons,
hexagons, etc., for tools, drills, lathe tools, punches, dies, etc.
Annual cap., 25,750 tons ingots (4,000 tons crucible, 8,000 tons

electric, 13,750 tons open hearth); 15,500 tons rolled products; 1,000 tons hammered products; cold drawn products, 1,800 tons.

ATLAS STEEL CASTING CO., 1963 Elmwood Ave., Buffalo, N. Y. Inc. March 13, 1911 in New York. Capital stock: com. auth. \$375,000, issued \$360,300; pref. 7% cum., auth. \$25,000, issued \$10,000.

G. H. Chisholm, P.; E. C. Strong, V. P. & G. M.; H. L. Chisholm, Sc. & P. A.; C. R. Wyckoff, T. & G. S. M.; W. H. Laverack, G. S.

Sales office:

New York, F. D. Moffat & Co., 200 Fifth Ave.

Works at Buffalo: blt. 1911-12; f. o. Feb. 19, 1912; 3 A. O. H. fur. (one 15-ton, two 20-ton).

Product: steel ingots and miscellaneous castings for sale; annual cap., 30,000 tons of ingots, and 15,000 tons of castings.

AURORA FOUNDRY CO., 3227 First Ave. South, Seattle, Wash.

Inc. May, 1917 in Washington. Capital stock: com. \$30,000.

John H. Ironside, P., G. M. & G. S. M.; E. H. Hutchison, V. P.; D. Daneman, Sc.; George F. Haag, T. & P. A.; M. G. Tennent, S.

Works at 3300 Occidental St., Seattle: blt. 1917; f. o. Aug., 1917; destroyed by fire Sept. 13, 1918 and rebuilt; one 2½-ton Greene electric furnace.

Product: steel castings for sale; annual cap., 350 tons.

AVERY COMPANY, Peoria, Ill.

Inc. Nov. 23, 1907 in Illinois. Capital stock: com. \$2,500,000; pref. 7% cum. \$1,000,000.

J. B. Bartholomew, P.; R. J. Boynton, V. P.; G. L. Avery, Sc.; E. A. Cole, T.; F. P. Kinsey, G. S.; C. E. Bronner, G. S. M.; E. R. Bowen, A. S. M.; A. Y. Bartholomew, A. S. M.; G. T. Klein, P. A.

Sales offices: Aberdeen, S. D.; Billings, Mont.; Columbus, O.; Davenport, Iowa; Des Moines, Ia.; Fargo, N. D.; Grand Forks, N. D.; Indianapolis, Ind.; Kansas City, Mo.; Lincoln, Neb.; Los Angeles, Cal.; Madison, Wis.; Minneapolis, Minn.; Omaha, Neb.; San Francisco, Cal.; Sidney, Neb.; Sioux Falls, S. D.; Stuttgart, Ark.; Waterloo, Iowa; Wichita, Kan.

Distributors: Avery Co., of Texas, Dallas, Amarillo and Beaumont, Texas; Canadian Avery Co., Winnipeg with branches at Regina, Calgary and Saskatoon and sub-branches at Lethbridge and Camrose.

The company operates three plants for the manufacture of farm machinery, tractors, traction engines and threshing machines.

Two plants are at Peoria, Ill. and one at Milwaukee, Wis.

Steel Plant, Peoria, Ill.: f. o. 1917; 2 Booth-Hall electric fur. (1-ton).

Product: steel castings for own use; annual cap., 2,400 tons; gray iron and semi-steel castings, 35,000 tons.

Baldt Steel Co. (The), New Castle, Del., see 1916 Directory, p. 43, was acquired by the Penn Marine & Ordnance Castings Co., Inc., Feb. 1, 1916; name of latter company changed to Penn Seaboard Steel Corporation in June, 1916; plant sold to American Locomotive Co., July 2, 1917.

BALDWIN LOCOMOTIVE WORKS (The), 500 North Broad St., Philadelphia, Pa.

Inc. June 7, 1911 in Pennsylvania. Capital stock: com. \$20,000,000; pref. 7% cum. \$20,000,000.

Arthur E. Newbold, Ch.; William L. Austin, V. Ch.; Samuel M. Vauclain, P.; G. Greenough, V. P. in charge of Domestic Sales; John P. Sykes, V. P. in charge of Manufacture; F. de St. Phalle, V. P. in charge of Foreign Sales; William de Krafft, V. P. & T.; James McNaughton, V. P.; Arthur L. Church, Sc.; J. H. Kerst, A.; A. B. Ehst, C.; C. A. Bourgeois, Works M.; W. A. Russell, P. A.

Branch offices:

Chicago, 627 Railway Exchange.

Houston, Texas, Carter Bldg.

New York, 120 Broadway.

Pittsburgh, 279 Union Arcade Bldg.

Portland, Ore., 313 Northwestern Bank Bldg.

Richmond, Va., 407 Travelers Bldg.

San Francisco, 310 Sansome St.

St. Louis, 1210 Boatmen's Bank Bldg.

St. Paul, 812 Merchants National Bank Bldg.

Works at Eddystone and Philadelphia, Pa.

Eddystone Plant, Eddystone, Pa.: blt. 1906; two 2-d. heat. fur.; 10" 3-h. 3-st. guide mill; 48 steam hammers (600-lb. to 4,000-lb.); 17 forging presses (300-ton to 500-ton). Fuel, bit. coal. Gray iron foundry. Product: merchant bar for own use, annual cap., 5,500 tons; locomotive forgings, 40,000 tons; steam and electric locomotives and electric trucks.

Philadelphia Works: product, locomotives (steam, compressed air, electric and gasoline), electric motor and trailer trucks.

BALDWIN'S CANADIAN STEEL CORPORATION, Toronto, Canada.

Works at Ashbridges Bay, Toronto, Ontario: blt. 1917; ten 6-ton Heroult electric fur.; f. o. June 15, 1917. (Formerly owned by British Forgings, Ltd.; acquired by Baldwin's Canadian Steel Corp., Aug. 15, 1919.) Plan to build tinplate plant.

Product: steel ingots and castings for own use; annual cap., 100,000 tons.

BALTIMORE AND OHIO RAILROAD CO., Baltimore, Md.

J. T. Carroll, G. S. Maintenance of Equipment.

Mount Clare Shops, Mount Clare, Baltimore, Md. : 1 double Furgerson heat. fur. ; 10" 3-h. 1-st. reclaiming train added Jan., 1914; first products rolled Jan. 10, 1914. Fuel, oil.

Product : flat and round iron and steel rolled from scrap for company use ; annual cap., 1,700 tons.

BALTIMORE ELECTRO ALLOYS CO. (The), 1611 Lexington Bldg., Baltimore, Md.

Inc. May 11, 1915 in Maryland. Capital stock : com. auth. \$750,000, issued \$517,000. Formerly known as the Shawinigan Electro Products Co. ; name changed Dec. 17, 1919.

Charles E. F. Clarke, P. ; at 42 Wall St., New York. J. A. Walls, V. P. ; James L. Rintoul, Sc., T. & A. ; M. Harman, G. M. ; J. E. O'Connor, P. A. ; at Baltimore.

Works at Highlandtown, Md. : blt. 1915, f. o. Dec. 23, 1915 ; three 3-phase open-top electric fur. Hydro-electric power from Pennsylvania Water & Power Co., Baltimore.

Product : ferro-silicon, ferro-silicon-aluminum, ferro-chrome, and other ferro-alloys, annual cap., 15,000 tons.

BALTIMORE MALLEABLE IRON & STEEL CASTING CO., Charles & Wells Sts., Baltimore, Md.

Inc. Feb. 26, 1908 in New Jersey.

Joseph P. Kennedy, P., Sc. & G. M. ; Francis Kennedy, V. P. & T. ; J. Alonzo Reynolds, A. T. ; K. M. Kaltenbach, A. Sc. ; Frank J. Flynn, P. A.

Works at Charles & Wells Sts., Baltimore : 2 A. O. H. fur. (12-ton, 15-ton) used for melting stock for malleable foundry (5,000 tons annual cap.) and also for steel castings.

Product : steel castings, annual cap., 2,000 tons, and malleable iron castings, for sale.

Baltimore Sheet & Tin Plate Co. was organized in 1916 to build a sheet and tinplate plant at Baltimore. Company was purchased by Bethlehem Steel Company and the plant erected at Sparrows Point, Md., instead of Canton, Baltimore, Md.

BANCROFT & MARTIN ROLLING MILLS CO., South Portland, Maine.

Inc. June 1, 1912 in Maine. Capital stock : com. auth. \$300,000, issued \$240,000.

Seth L. Martin, P. ; at 722 Oliver Bldg., Boston. Kenneth T. Burr, T. ; Sherburne H. Sleeper, A. ; W. Foster Barry, S. ; at South Portland.

Sales office : Boston, 722 Oliver Bldg.

Works at South Portland : blt. 1866 ; last rebt. 1903 ; 6 busheling fur. (1-d.) ; 1 squeezer ; 5 rehear. fur. (one 3-d. and four 4-d.) ; 18" 3-h. 2-st. puddle mill ; 18" 3-h. 5-st. bar ; 10" to 16" 3-h. 5-st. tandem ; 8" 3-h. 4-st. mill. Fuel, bit. coal. (Formerly owned by Portland Iron & Steel Co. ; acquired by Bancroft and Martin

Rolling Mills Co., Jan. 1, 1917). B. O. H. fur. (25-ton) long idle was not purchased, see Portland Iron & Steel Co.

Product: steel bars for reinforced concrete work; merchant bars, bolt iron and shafting; annual cap., 40,000 tons rolled products.

Banner Iron Works, St. Louis, Mo., see 1916 Directory, p. 44, converter sold and dismantled in 1917. Manufacture of steel castings discontinued.

Barnum-Richardson Co., Lime Rock, Conn., see 1916 Directory, p. 44. Horace W. Davis appointed receiver, Nov. 13, 1918. Properties sold to E. E. Anderson, Sharon, Pa., and taken over in Jan. 1920, by Salisbury Iron Corporation.

BASS FOUNDRY AND MACHINE CO. (The), Rock Run, Ala.

Est. 1898; reinc. 1919 in Indiana. Capital stock: \$1,500,000; bonds, \$460,000.

J. H. Bass, P.; C. T. Strawbridge, 1 V. P.; W. C. Slater, Sc.; G. M. Leslie, T.; at Fort Wayne, Ind. J. M. Garvin, 2 V. P.; at Rock Run, Ala.

Selling agents: Crocker Brothers, 21 E. 40th St., New York City; The Domhoff and Joyce Co., Cincinnati, Ohio.

Brand: "Rock Run."

Rock Run Furnace, Rock Run, Ala.: 1 stack, 54' x 11', blt. 1873-4, last rebt. 1907; warm blast, one 32-pipe stove; 2 steam blowing eng. (10,000 cfm.); 1 tubular boiler, 100 H. P.; 6 flue boilers, 400 H. P. Charcoal; local brown hematite ore.

Operates iron ore mines at Langdon, Ala., and owns and operates iron ore mines at Rock Run, Ala. (annual cap., 32,000 tons); limestone quarries at Huffaker, Ga. (annual cap., 10,000 tons); 54 charcoal kilns (annual cap., 1,600,000 bushels).

Product: charcoal pig iron for car wheels and strong castings, annual cap., 18,000 tons.

The company also owns and operates works at Fort Wayne, Ind., equipped for the manufacture of car wheels, castings, axles, iron and steel forgings, Corliss engines, boilers, and complete power plants.

Battelle Furnace, Battelle, Ala., see 1916 Directory, p. 46, sold by W. S. Rowe to the Tata Iron & Steel Co., Sakchi, India; dismantled in 1917 and removed to India.

BAYONNE STEEL CASTING CO., Bayonne, N. J.

Inc. 1910 in New Jersey. Capital stock: com. auth. \$500,000, issued \$429,100.

Wm. D. Sargent, P. & T.; C. M. Barber, Sc.; A. H. Jameson, 1 V. P. & G. M.; C. J. Jernstrom, G. S.; L. P. Rampolla, P. A.; at Bayonne, N. J. A. E. Williamson, 2 V. P.; at Jersey City.

Sales office: Bayonne, N. J.

Works at Bayonne, N. J.: blt. 1910; f. o. Aug. 20, 1910; 2 Tropenas

converters (2-ton); 1 A. O. H. fur. (6-ton); 3 cupolas (2 for pig iron and one for spiegel). Fuel, coke, anthracite coal and oil. One 3-ton Heroult electric fur. discontinued Dec. 31, 1918 and equipment sold.

Product: marine, general machinery and motor castings; annual cap., 3,500 tons converter, 4,500 tons open hearth steel castings.

BAY VIEW FOUNDRY CO. (The), Sandusky, Ohio.

Inc. Oct. 1, 1904 in Ohio. Capital stock: auth. \$200,000, issued \$167,000.

A. W. Link, P. & G. M.; E. L. Marsh, V. P. & T.; P. L. Harten, Sc. & A. T.

Works at Sandusky, Ohio: one 1-ton Tropenas converter, f. o. July, 1918; 2 cupolas. Gray iron, brass and aluminum foundry; annual cap., 10,000 tons gray iron castings. Machine shop for light work. Pattern shop for metal and wood patterns.

Product: small steel castings for sale for automobiles, tractors, trucks and machinery, annual cap., 1,800 tons.

Bay View Steel Casting Co. (The), Milwaukee, Wis., see 1916 Directory, p. 46. Idle and reported abandoned.

BEAUCHEMIN ET FILS, Ltd., Sorel, P. Q., Canada.

Est. 1855; inc. 1903 as a limited company. Capital stock: com. auth. \$100,000, issued \$62,700.

Alfred Beauchemin, P., G. M. & G. S. M.; V. Emmanuel Beauchemin, V. P. & G. S.; Louis Phillipe Tremblay, Sc., T. & P. A.

Works at Sorel: 2 steel converters (1 Stoughton, 1 Baillot); first steel made Mar. 5, 1909; 2 cupolas. Machine shop for jobbing and own use. Fuel, coke. Gray iron foundry.

Product: carbon and alloy steel castings for sale and own use, from 1-lb. to 10-ton, for machinery, railway purposes, marine and dredging plants, agricultural implements, etc.; annual cap., 1,000 to 1,500 tons. Manufacture agricultural machinery, concrete pipes for culverts, bridges and sewers; repairs to ships, fitting out and electric welding.

BEAUMONT IRON WORKS CO., Beaumont, Texas.

Inc. 1910 in Texas. Capital stock: com. \$225,000.

L. J. Black, P. & G. M.; T. S. Read, V. P.; Chas. B. Sheeks, Sc.; Ed. Paggi, T.; L. L. Donnelly, A.; M. M. Raymer, G. S.; N. P. Erwin, G. S. M. & P. A.

Sales offices: Houston, Texas, R. W. Jeffrey.

Works at Beaumont, Texas: one 1-ton Snyder electric fur., installed 1918; f. o. Mar., 1918; 2 cupolas; 2 hammers; one 500-ton hydraulic forging press being installed. Gray iron and brass foundry.

Product: steel ingots and steel castings for own use and for sale; nickel, chrome and manganese alloy steel ingots and castings; forged squares and rounds; annual cap., 1,000 tons of steel ingots

or 750 tons steel castings; 600 tons forged squares and rounds; 3,000 tons gray iron castings, 150 tons brass castings.

BECKER STEEL CO. OF AMERICA, Inc., 154 Nassau Street, New York, N. Y.

Inc. Mar. 19, 1915 in West Virginia. Capital stock: com. auth. \$750,000, issued \$280,000; bonds \$408,000.

Walter R. Comfort, P.; Joseph Krieg, V. P.; Douglas Nicholson, Sc. & T.; Max Kuch, A. T.; William Peters, G. S. M.; at New York. Adolf J. Becker, Works M.; at Charleston, W. Va.

Sales office: Detroit, Mich., Chas. A. Carr, 705 Ford Bldg.

Works at Charleston, W. Va.: blt. 1906-07; 2 crucible fur. (one 24-pot, one 30-pot); f. o. Mar. 19, 1907; 2 bar mills (10" and 14") with 3 heat. fur.; 10 annealing fur.; 7 ham. (500-lb. to 3-ton) with 7 heat. fur.; one hand pickling tank. First rolled products made Mar. 25, 1907. Fuel, nat. gas.

Product: crucible steel ingots, alloy steel ingots, high-grade tool steel, high speed steel; annual cap., 1,000 ingots, 6,000 tons rolled or hammered tool steel.

BELFONT IRON WORKS CO., Ironton, Ohio.

Inc. Jan. 23, 1863 in Ohio. Capital stock: com. \$625,000.

S. G. Gilfillan, P., G. M. & P. A.; J. R. Gilfillan, Sc. & G. S. M.; C. W. Moulton, T.; I. A. Ryan, S. Mill Dept.; Karl Steinbacker, S. Blast Fur. Dept.; at Ironton. John Peebles, V. P.; at Portsmouth, Ohio.

Brand: "Belfont."

The company owns and operates a blast furnace and wire mill at Ironton.

Belfont Furnace: 1 stack, 75' x 16', blt. 1868, rebld. 1904-5 and 1919; 3 stoves (1 McClure 3-pass, 75' x 18'; 2 Freyn-Brassert 2-pass side-combustion, 80' x 20'); 2 steam blowing eng. (15,700 cfm.), turbo-blower (25,000 cfm.); 4 water-tube boilers, 2,000 H. P. Pocahontas and by-product coke: Lake ore.

Product: bessemer pig iron; annual cap., 100,000 tons.

Wire Mill: 51 wire drawing blocks, No. 2 to No. 18 gage; 65 wire nail mach.; 1 galvanizing pan.

Product: plain wire, annual cap., 21,000 tons; wire nails, annual cap., 270,000 kegs; galvanized wire and nails, woven wire fencing; painted and galvanized barbed wire.

Belgo-Canadian Steel Co., Ltd., Montreal, see 1916 Directory, p. 47, plant dismantled, see Standard Steel Co., Ltd.

BERGER MANUFACTURING CO. (The), 1038 Belden Ave., N. E., Canton, Ohio.

Inc. Jan., 1906 in Ohio. Capital stock: com. auth. \$5,000,000, issued \$2,500,000; pref. 7% cum. auth. \$5,000,000, issued \$2,500,000.

E. A. Langenbach, P.; F. H. Snyder, 1 V. P.; George H. Charls,

2 V. P. & G. M.; R. H. Yancey, 3 V. P. & P. A.; William Langenbach, 4 V. P.; Charles W. Krieg, Sc. & T.; A. E. Hockwalt, C.
Sales offices:

Boston, 450-454 Broadway.

Chicago, 20 N. Market St.

Kansas City, Mo., 20th St. & Tracy Ave.

Minneapolis, 300-12 10th Ave., South.

New York, 516-524 W. 25th St.

Philadelphia, 16th & Washington Ave.

St. Louis, 16 South 10th St.

San Francisco, 1120 Mission St.

Rolling Mill at Canton: blt. 1900-1; f. o. Oct. 1, 1901; enl. 1906-7; 56" 2-h. jobbing plate mill with 1 coal-fired sheet and pair fur. and one open annealing fur.; 27 black sheet mills (seven 44", seven 38", six 36", seven 34") with 15 sheet and 15 pair fur. and 12 comb. fur.; 13 cold mills (eleven 48", two 54"); 24 double box annealing fur.; 10 pickling tanks; 10 galvanizing pots, annual cap., 100,000 tons. Product: black and galvanized sheets, flat and corrugated; annual cap., 153,000 tons; roofing, siding, ceiling, eave troughs and spouting, ridge rolls, laths, bins and shelving, filing cases, etc.

Berkshire Iron Works, Sheridan, Pa., see 1916 Directory, p. 48, was purchased by E. J. Lavino & Co., in March, 1916, and merged in Lavino Furnace Co., Jan., 1918.

BESSIE FURNACE CO. (The), 52 E. Gay St., Columbus, Ohio.

Inc. in 1913 in Ohio. Capital stock: \$300,000.

Caleb L. McKee, P. & T.; at 52 East Gay St., Columbus, Ohio.

Charles B. Donahue, V. P. and Sc.; at Logan, Ohio. P. J. Moran, G. M.; at Cleveland.

Sales agents: M. A. Hanna & Co., Cleveland, Ohio.

Brands: "Bessie" and "Pencost."

Bessie Furnace at New Straitsville, Perry County, Ohio: 1 stack, 75' x 14', blt. 1878, rebt. 1914; 3 Amsler stoves, 75' x 18'. Coke: Lake ore.

Product: 9 to 13 per cent. bessemer ferro-silicon and silvery iron, annual cap., 24,000 tons.

BEST STEEL CASTING CO., 105th Ave., Oakland, Cal.

Inc. Aug., 1913 in California. Capital stock: com. auth. \$250,000, issued \$120,000.

H. H. Whiting, P. & G. M.; George A. Gunn, T. & G. S. M.; at San Francisco. John Tuohy, V. P. & G. S.; Violet Purcell, Sc.; I. L. Johnson, P. A.; at Oakland.

Sales office: Hobart Bldg., San Francisco, Cal.

Works at Oakland: blt. 1910, f. o. Feb. 21, 1911; two 2-ton converters (one Whiting, one Stoughton); 2 cupolas; installing 2 electric fur. (one 6-ton Heroult, one 1,500-lb. Rennerfelt). Fuel, coke, and oil. Gray iron foundry, annual cap., 6,000 tons.

Product: steel castings for sale (1-lb. to 5-ton); chrome, nickel-chrome, and manganese alloy steel castings; annual cap., 5,000 tons.

BETHLEHEM STEEL CORPORATION, 111 Broadway, New York, N. Y.

Inc. Dec. 10, 1904 in New Jersey. Capital stock (Dec. 31, 1919): com. auth. and issued \$15,000,000, outstanding \$14,862,000; Class B com. auth. \$75,000,000, issued \$45,000,000, outstanding, \$45,000,000; pref. 8% cum. auth. and issued \$30,000,000; pref. 7% non-cum. auth. and issued \$15,000,000, outstanding \$14,908,000; bonds (Dec. 31, 1919), \$31,889,525; subsidiary companies' bonds \$87,881,366.

Charles M. Schwab, Ch.; Eugene G. Grace, P.; Archibald Johnston, V. P.; Henry S. Snyder, V. P.; H. E. Lewis, V. P.; James H. Ward, V. P.; R. E. McMath, Sc.; E. B. Hill, T.; F. A. Schick, C. Bethlehem Steel Corporation owns the capital stock of the following subsidiary companies:

Bethlehem Steel Company, Bethlehem, Pa.

Union Iron Works Co., San Francisco, Cal.

Bethlehem Shipbuilding Corporation, Bethlehem, Pa.:

Sparrows Point Plant, Sparrows Point, Md.

Harlan Plant, Wilmington, Del.

Moore Plant, Elizabethport, N. J.

Fore River Plant, Quincy, Mass.

Fore River R. R. Corp., Quincy, Mass.

Hunters Point Plant, San Francisco, Cal.

Also operates under lease the plant of Union Iron Works Co.

Penn-Mary Coal Co., Heilwood, Pa.

Bethlehem Iron Mines Co., Cuba.

Bethlehem Mines Corporation:

Quarries at Bethlehem, Steelton, Lebanon and Hanover, Pa., and McAfee, N. J.

Service Stores Corporation, Bethlehem, Pa.

Redington Standard Fittings Co., Bethlehem, Pa.

BETHLEHEM STEEL CO., BETHLEHEM PA.

Inc. April 17, 1899 in Pennsylvania. Capital stock: com. \$65,000,000.

Eugene G. Grace, P.; Archibald Johnston, V. P.; Henry S. Snyder, V. P.; C. A. Buck, V. P.; Quincy Bent, V. P.; H. E. Lewis, V. P.; R. E. McMath, Sc.; E. B. Hill, T.; F. A. Shick, C.; Edward S. Knisely, G. S. A.; William M. Tobias, P. A.

Sales offices:

Atlanta, Charles P. King, Candler Bldg.

Baltimore, Jesse A. Davis, Continental Bldg.

Boston, R. B. Wallace, Oliver Bldg.

Chicago, Robert E. Belknap, Peoples' Gas Bldg.

Cleveland, Stanley H. Smith, Guardian Bldg.

Detroit, John S. Hageman, Penobscot Bldg.
New York, J. M. Ellis, Trinity Bldg.
Philadelphia, W. B. Kennedy, Morris Bldg.
Pittsburgh, Edward S. Illig, First Nat. Bank Bldg
St. Louis, E. B. C. Goyne, Boatmen's Bank Bldg.
San Francisco, Henry B. Green, Monadnock Bldg.
Export sales representative: Consolidated Steel Corporation, 165
Broadway, New York.

Properties:

Bethlehem Plant, Bethlehem, Pa.:

Lehigh Works: blast furnaces, steel works and rolling mills.

Saucon Works: steel works and rolling mills.

Northampton Works: by-product coke ovens.

Steelton Plant, Steelton, Pa.: blast furnaces, steel works and
rolling mills.

Maryland Plant, Sparrows Pt., Md.; blast furnaces, steel works,
rolling mills, and tinplate works.

Lebanon Plants, Lebanon:

Lebanon Furnaces: 2 blast furnaces.

Colebrook Furnaces: 2 blast furnaces.

Operates under lease 3 blast furnaces owned by Cornwall Iron
Co. at Cornwall, Pa.

American Iron & Steel Works: steel works and rolling mills.

American Iron & Steel Works, Reading: rolling mills.

Detrick & Harvey Plant, Baltimore, Md.; machine tools and
special machinery.

Cornwall Ore Banks and Mine Hills (own 80.20%).

Cornwall Furnace Co. (own $\frac{1}{6}$).

Cornwall Iron Co.

Cornwall R. R. Co., Lebanon, Pa.

Subsidiaries:

Bethlehem Steel Products Co., Bethlehem.

Bethlehem Steel Bridge Corp., Bethlehem.

Bethlehem Loading Co., Bethlehem: New Castle Plant, New
Castle, Del., owned by Bethlehem Steel Co.

Philadelphia, Bethlehem & New England R. R. Co., Bethlehem, Pa.

Steelton & Highspire R. R. Co., Steelton, Pa.

Patapsco & Back Rivers R. R. Co., Sparrows Pt., Md.

Ore Steamship Corp., Bethlehem, Pa.

Lebanon Consolidated Water Co., Lebanon, Pa.

Lebanon Water Co., Lebanon, Pa.

Lebanon County Light, Heat & Fuel Co., Lebanon, Pa.

Pine Township Water Co., Heilwood, Pa.

Possum Glory Water Co., Heilwood, Pa.

Spanish-American Iron Co., Cuba.

Juragua Iron Co., Cuba.

Bethlehem Chile Iron Mines Co., Chile.

Dundalk Co., St. Helena, Md.

Dundalk Water Co., St. Helena, Md.

Dundalk Sewerage Co., St. Helena, Md.

Saucon Land & Improvement Co., Bethlehem, Pa.

Lehigh Plant, Bethlehem, Pa. : Blast Furnaces, 7 stacks.

Fur-nace.	Present size.	Built.	Last rebuilt.	First blown in.	No.	Kind.	Stoves.	Size.
A	90' x 22'	1866	1914	1867	5	McClure	100' x 22'	
B	70' x 18'	1874-75	1916	Mar. 17, 1876	4	Whitwell	90' x 18'	
					1	McClure	100' x 22'	
					4	Whitwell	70' x 18'	
C	80' x 18'	1874-75	1914	1877	1	McClure	100' x 22'	
D	90' x 22'	1881	1909	1883	5	McClure	100' x 22'	
E	90' x 22'	1906	—	Apr. 22, 1907	5	McClure	100' x 22'	
F	90' x 22'	1910	—	Mar. 15, 1911	5	McClure	100' x 22'	
G	90' x 22'	1910-11	—	July 30, 1911	5	McClure	100' x 22'	

Sixteen blowing eng. (13 Bethlehem gas, 3 Southwark steam) 457,600 cfm.; 87 water-tube boilers, 43,587 H. P. furnish power also to Armor Plate, Rolling Mills, Forge and Projectile Departments; 2 Uehling double-strand casting machines. By-product coke: Lake, Cuban, New Jersey and New York ores. Product: basic, bessemer and foundry pig iron; annual cap., 1,000,000 tons. Steel Depts.: 4 A. O. H. fur. (10, 15, 20 and 40-ton); 12 B. O. H. fur. (two 30-ton, three 40-ton, seven 50-ton); two 400-ton hot metal mixers; first acid steel, Aug. 11, 1888, first basic steel, Jan. 3, 1893; 3 electric fur. (one 10-ton Girod, one 6-ton and one 3-ton Heroult); 4 crucible steel melting fur. (two 36-pot, two 30-pot); 2 cupolas for melting spiegel; 6 cupolas for melting pig iron for foundry. Product and annual capacity: steel ingots, 377,200 tons (239,200 basic, 116,000 acid open-hearth; 12,000 electric, 10,000 crucible); 13,100 tons basic open-hearth steel castings; 56,400 tons gray iron castings; 1,600 tons brass castings.

Rolling Mills: 13 double puddling fur.; 1 squeezer; 22" 3-h. 2-st. muck, 22" 3-h. 4-st., 12" 3-h. 4-st. iron bar; 16" 3-h. 5-st., 12" 3-h. 5-st. iron bar, 12" 3-h. 1-st., 9" 3-h. 4-st. and 9" 2-h. 1-st. crucible bar; 5 soaking pits; 6 cont. heat. fur.; 35" 2-h. 1-st. blooming; 18" 2-h. 4-st. billet; 22" 3-h. 3-st. and 22" 2-h. 1-st. bar; 16" 3-h. 1-st., 10" 3-h. 6-st. bar; 12" 3-h. 1-st., 8" 3-h. 5-st., 8" 2-h. 1-st. bar; 60 bar, bloom, heat-treating and projectile heat. fur.; 138 shell heat. fur.; 48 box annealing fur.; 57 steam and board hammers (400-lb. to 16,000-lb.); 44 hydraulic forging presses (100-ton to 5,000-ton). Armor Plate Dept., machine shop for general work, rough machining and finishing forgings, and for heavy ordnance up to 16", trimming, shaping and machining armor plates. Drop forge plant for all kinds of drop forgings. Product and annual cap.: 80,000 tons muck and scrap bar, 640,000 tons blooms and billets, 650,000 tons finished iron and steel rolled products, 125,000 tons forged products, 12,000 tons armor plate.

Saucon Plant, Bethlehem, Pa.: blt. 1906-07, first steel made, Aug. 12, 1907, first rails rolled, Aug. 31, 1907, first structural shapes, June 8, 1908; 18 B. O. H. fur. (ten 50-ton, six 75-ton stationary, two 200-ton tilting); three 20-ton Bessemer converters for duplexing, first duplex steel, Feb. 18, 1911; four hot metal mixers (250-ton, 400-ton, 1,000-ton, and 1,300-ton); 3 cupolas. Annual cap., 942,400 tons basic open-hearth ingots. Bessemer converters (annual cap., 375,000 tons) used only for duplexing.

Rolling Mills: fifteen 4-hole soaking pits; 23 heat. fur. (fifteen 4-d., eight cont.); 46" 2-h. 2-st. blooming, 48" 2-h. 2-st. intermediate and 48" 2-h. 2-st. finishing structural for wide-flanged beams; 42" Bethlehem shape mill with 2-st. 2-h. intermediate 2-st. 2-h. finishing; 40" 2-h. 1-st. blooming, 28" rail with 1-st. 2-h. roughing, 1-st. 3-h. and 1-st. 2-h. finishing; 28" structural with 1-st. 2-h. roughing, 1-st. 3-h. and 1-st. 2-h. finishing; 28" 3-h. 1-st. billet under construction; 18" 3-h. structural with 2-st. 3-h. and 1-st. 2-h.; 12" 2-h. 4-st. structural, 16" 2-h. 6-st. structural; 3 steam hammers (300-lb., 1,500-lb., 3,000-lb.). Fabricating shop, machine shop and roll shop. Product and annual cap.: blooms billets and slabs, 844,000 tons; rails 160,000 tons, structural shapes 710,000 tons, hoops 15,000 tons; forgings for own use 23,000 tons.

Steelton Plant, Steelton, Pa.: Blast Furnaces, 6 stacks.

Furnace.	Present size.	Built.	Blown in.	Rebuilt	Relined No.	Stoves Kind.	Size.
2	80' x 19'6"	1874-6	June, 1877	1877	1918	1 Whitwell 1 Kennedy 2 Kennedy 1 P. S. Co.	70' x 18' 70' x 18' 95' x 20' 90' x 22'
A	88' x 22'	1917-8	Nov. 7, 1918	—	—	4 P. S. Co.	100' x 24'
B	88' x 22'	1916-7	Nov. 22, 1917	—	—	2 P. S. Co. 1 P. S. Co.	100' x 24' 100' x 22'
C	85'3" x 20'	1883-4	Feb., 1884	1906	1917	1 Kennedy 1 Kennedy 1 P. S. Co.	86' x 20' 90' x 20' 100' x 22'
D	85'3" x 20'	1883-4	Apr., 1884	1908	1917	2 P. S. Co. 1 Kennedy 1 Kennedy	100' x 22' 86' x 20' 90' x 20'
E	88' x 22'	1914-5	Sept. 21, 1915	—	1917	4 P. S. Co.	100' x 24'

four steam and nine gas blowing eng. (325,375 cfm.); 50 water-tube boilers, 17,150 H. P., furnish power also to rolling mills and forge shop; 2 Heyl & Patterson double-strand casting machines; Greenawalt sintering plant for fine ore and flue dust, annual cap., 48,200 tons; Mosser & Sons rotary kiln nodulizing plant for fine ore and flue dust, annual cap., 36,500 tons. Molten metal to mixers and O. H. fur. By-product coke: Cuban ore. Furnace No. 1 was dismantled in 1919. Product: basic, bessemer, low-phosphorus and Mayari pig iron; annual cap., 614,000 tons.

By-product coke plant at Steelton, 120 Semet-Solvay and 60 Koppers by-product coke ovens, annual cap., 678,000 net tons coke. By-product recovery plant. Koppers benzol plant, annual cap., 935,500 gal. light oil.

Ten B. O. H. fur. (one 20-ton, one 30-ton, five 75-ton, three 200-ton tilting); one 75-ton A. O. H. fur.; three 20-ton Bessemer converters with 2 cupolas for duplexing; 2 hot metal mixers (one 800-ton, one 300-ton); crucible steel fur. dismantled; annual cap., 643,500 tons ingots (602,200 basic, 41,300 acid O. H.), 12,000 tons basic open hearth steel castings. Rolling Mills: rail mill, six 1-hole soaking pits; 34" 3-h. 1-st. blooming; 26" 3-h. 2-st. billet mill; slabbing mill, seven 1-hole soaking pits, 34" 2-h. 1-st. slabbing mill; rail and structural, five 4-hole soaking pits, 44" 2-h. 1-st. blooming, 35" 2-h. 1-st. cogging, 28" 3-h. 2-st. intermediate, 28" 2-h. 1-st. finishing; merchant, 20" 3-h. 4-st., 13" 3-h. 5-st., 16" 3-h. 1-st. and 14" 3-h. 5-st. merchant bar mills; 28 heat. fur. (twenty 2-d., three 3-d., five cont.); 3 annealing fur., 1 heat. treating fur., 1 preheater. Forge shop: 18 heat. fur. (twelve 2-d., three 3-d., three 4-d.); two steam ham. (2,500-lb., 5,000-lb.); 6 hydraulic forging presses (300-ton to 2,000-ton). Annual cap., 620,000 tons blooms, billets and slabs, 200,000 tons rails, 20,000 tons structural shapes, 95,000 tons splice bars, 45,000 tons bolt and rivet rods, 50,000 tons merchant bars, 51,000 tons forgings for marine engines. Bridge and Construction Dept.: product, railway, highway and various types of rolling, lift and swing bridges, annual cap., 120,000 tons. Frog and Switch Dept.: product, frogs, switches, bolts and rivets, annual cap., 34,200 tons.

(Formerly owned by the Pennsylvania Steel Co.; acquired by the Bethlehem Steel Co., Mar. 1, 1916).

Maryland Plant, Sparrows Point, Md.: Blast Furnaces, 6 stacks.

Furnace.	Present size.	Built.	Last rebuilt.	Relined.		Stoves.
A	85' x 21'6"	1887-89	1911	1919	4	Whitwell 90' x 22'
B	85' x 20'	1887-90	1913	1918	4	Whitwell 90' x 22'
C	85' x 20'	1887-91	1914	1918	4	Whitwell 90' x 22'
D	85' x 20'	1887-91	1915	1917	4	Whitwell 90' x 22'
E	95' x 22'	1919-20	—	—	4	Freyn 100' x 22'
F	95' x 22'	1919-20	—	—	4	Freyn 100' x 22'

Four steam blowing eng., five gas blowing eng. (300,000 cfm.); six gas blowing eng. under construction; 40 water-tube boilers, 10,000 H. P.; 1 Heyl & Patterson double-strand casting mach.; sintering plant for flue dust, Mayari ore and pyrites cinder, annual cap., 140,000 tons; 2 slag granulating pits, annual cap., 220,000 tons. By-product coke: Cuban, Lake and Swedish ore. Product: basic pig iron; annual cap., not including 1 building stack, 695,000 tons.

By-product coke plant: 360 Koppers by-product coke ovens,

annual cap., 1,500,000 net tons coke. By-product recovery plant. Koppers benzol plant, annual cap., 4,000,000 gals. light oil. Steel Works, Bessemer Dept.: blt. 1889-92; O. H. completed 1910; four 18-ton Bessemer converters, annual cap., 300,000 tons; three 25-ton Bessemer converters; 8 B. O. H. fur. (five 50-ton, three 200-ton), annual cap., 460,000 tons when operated independently, 1,170,000 tons when operated in duplex process with Bessemer converters; one 200-ton B. O. H. fur. (annual cap., 240,000 tons duplex cap.), one 200-ton tilting fur. under construction; 3 hot metal mixers (100-ton, 1,000-ton, 1,300-ton); one 250-ton mixer; 4 cupolas for melting pig iron, 3 cupolas for spiegel. Gray iron and brass foundry, 4 cupolas, annual cap., 5,000 tons gray iron and 500 tons brass castings.

Rolling Mills: 14 one-hole soaking pits; 36" 2-h. 1-st. blooming; 26" 3-h. 3-st. rail mill; six 4-hole soaking pits; 40" 2-h. 1-st. blooming and slabbing mill; 24" 2-h. 6-st. billet and 18" 2-h. 6-st. billet and sheet bar mills. Annual cap.: 500,000 tons slabs, 500,000 tons blooms and billets, 200,000 tons sheet bars, 396,000 tons rails. One 36" x 110" 3-h. sheared plate mill; 12 hot black plate (tin) mills (28" x 30" to 28" x 34"); 4 trains cold rolls 3 sets to each train, 24" x 42"; 5 box annealing fur.; 2 pickling mach. Added in 1919, 2 jobbing plate mills, 8 black sheet mills, 12 black plate (tin) mills; 3 trains of 3 sets each of cold mills; 9 box annealing fur.; 3 pickling mach.; 3 galvanizing pots. Tin house; 20 tinning sets for coke tin plates, 20 additional tinning sets under construction. (Formerly owned by the Maryland Steel Co.; acquired by Bethlehem Steel Co., March 1, 1916.)

Product and annual cap.: 150,000 tons sheared plates, 110,000 tons universal plates, 50,000 tons black sheets, 20,000 tons galvanized sheets, 100,000 tons black plate for tinning, 2,000,000 base boxes tinplates.

Lebanon Plants, Lebanon, Pa.:

Lebanon Furnaces, North Lebanon, Pa.: 2 stacks; Furnace A, 80' x 18', blt. 1845, last rebt. 1918; Furnace B, 100' x 20', blt. 1872-73, f. o. Aug. 1873, rebt. 1898, relined 1918; 8 stoves (4 Massicks & Crooke, 1 Roberts, 3 Cowper); 6 steam blowing eng. (93,700 cfm.); 20 water-tube boilers, 5,500 H. P.; one Uehling double-strand casting machine; Greenawalt sintering plant for fine ore, annual cap., 234,000 tons; rotary kiln nodulizing plant for fine ore and flue dust, annual cap., 150,000 tons; Grondal magnetic concentrator for removal of copper and sulphur bearing minerals, annual cap., 275,000 tons. By-product coke: Cornwall, Port Henry and Lake ores. (Formerly owned by Pennsylvania Steel Co.; acquired by Bethlehem Steel Co., March 1, 1916.) Product: bessemer, low-phosphorus, basic and foundry pig iron; annual cap., 140,000 tons; spiegeleisen, 90,000 tons; ferro-manganese, 60,000 tons.

By-product coke plant, Lebanon, Pa. : 90 Semet-Solvay by-product coke ovens, annual cap., 198,000 net tons coke ; by-product recovery plant ; Semet-Solvay benzol plant, annual cap., 460,000 gals. light oil. Colebrook Furnaces, North Lebanon, Pa. : 2 stacks, Furnace C, 81' x 17', blt. 1881, remod. 1895, relined 1918 ; Furnace D, 85' x 17', blt. 1882, relined 1918 ; 8 two-pass center-comb. stoves ; 4 steam blowing eng. (44,000 cfm.) ; 12 water-tube boilers, 3,000 H. P. Coke and anthracite coal ; Cornwall, Port Henry and Lake ores. (Formerly owned by the Lackawanna Iron and Steel Co. ; acquired by the Bethlehem Steel Co., Feb. 1, 1917.) Product : low-phosphorus, forge and basic pig iron, annual cap., 120,000 tons ; spiegeleisen, 90,000 tons ; ferro-manganese, 60,000 tons.

Bird Coleman Furnaces, Cornwall, Pa., (formerly owned by Cornwall Iron Co. ; acquired by Bethlehem Steel Co., Dec. 1, 1918) : 2 stacks ; Furnace E, 75' x 17', blt. 1872-73 ; rebt. 1885, relined, 1918 ; Furnace F, 76' x 16' 10" blt. 1879, rebt. 1885, relined 1918 ; 4 two-pass side-comb. Whitwell stoves ; 2 steam blowing eng. (20,000 cfm.) ; 11 water-tube boilers, 2,250 H. P. ; one single-strand Heyl & Patterson casting machine. Coke and anthracite coal ; Cornwall, Port Henry and Lake ores. Product and annual cap. : foundry, basic and low-phosphorus pig iron, 50,000 tons ; spiegeleisen, 10,000 tons ; ferro-manganese, 5,000 tons.

North Cornwall Furnace, Cornwall, Pa. (formerly owned by Cornwall Iron Co.) : 1 stack, Furnace G, 77' x 17', blt. 1872, rebt. 1890, relined 1918 ; 3 four-pass Whitwell stoves ; 3 steam blowing eng. (25,000 cfm.) ; 8 water-tube boilers, 2,024 H. P. Coke and anthracite coal ; Cornwall, Port Henry and Lake ores. Product and annual cap. : low-phosphorus, foundry and basic pig iron, 40,000 tons ; spiegeleisen, 5,000 tons ; ferro-manganese, 3,000 tons.

American Iron & Steel Works, Lebanon, Pa. : rolling mill blt. 1882-83, first rolled products, Jan. 1883, first O. H. steel made Aug. 1914. Steel Dept. : four 50-ton tilting B. O. H. fur. and two 20-ton Roechling-Rodenhauser elec. fur. dismantled. Gray iron and brass foundry for own use. Rolling mills : 32 double puddling fur. ; 3 squeezers ; eighteen 4-d., heat. fur. ; 5 soaking pits ; three 20 3-h" 2-st. muck, one 20" 3-h. 1-st. muck ; 18" 3-h. 3-st. and 12" 3-h. 3-st., 12" 2-h. 1-st. tandem bar ; 16" 3-h. 3-st. and 16" 2-h. 2-st., bar ; two 12" 3-h. 5-st. bar ; 12" 3-h. 1-st., 9" 3-h. 4-st. and 9" 2-h. 1-st. tandem guide ; two 10" 3-h. 3-st. and 10" 2-h. 2-st. bar ; 8" 3-h. 4-st. and 8" 2-h. 1-st. guide ; 8" 3-h. 3-st. and 8" 2-h. 2-st. bar ; one acid and one pickling tank ; 3 galv. pots ; bolt, nut and spike factory. (Formerly owned by the American Iron and Steel Mfg. Co. ; acquired by Bethlehem Steel Co., Jan. 1, 1917.) Product and annual cap. : muck bar, 41,300 tons ; spike, bolt and nut rods, 87,000 tons ; merchant bars, 25,000 tons ; bolts 225,000

kegs; nuts 66,000 kegs; spikes 98,000 kegs; tail nuts, tie rods, car forgings, and turn buckles, 970 tons.

American Iron & Steel Works, Reading, Pa.: est. 1865, rolling mill blt. 1870; six 4-d heat. fur.; 18" 3-h. 2-st. and 10" 3-h. 4-st. tandem guide and bar; 12" 3-h. 2-st., 9" 3-h. 3-st. and 9" 2-h. 1-st. tandem guide; 10" 3-h. 3-st. and 10" 2-h. 1-st. guide; one case hardening and one heat treating fur.; 2 pickling tanks. Bolt, nut, rivet and spike factory. (Formerly owned by the American Iron & Steel Mfg. Co.; acquired by Bethlehem Steel Co., Jan. 1, 1917). Product and annual cap.; 37,000 tons bolt, nut, rivet and spike rods, 185,000 kegs rivets, 4,000 kegs nuts, 120,000 kegs bolts, 20,000 kegs spikes.

Total annual capacity: 2,514,000 tons pig iron, 3,217,100 tons ingots (3,037,800 basic, 157,300 acid, 12,000 electric, 10,000 crucible); 25,100 tons basic open hearth steel castings; 3,137,600 tons blooms, billets and slabs, 200,000 tons sheet bars, 254,300 tons muck and scrap bar; 2,909,000 tons finished rolled products, including 756,000 tons rails, 730,000 tons structural shapes, 135,000 tons merchant bars, 150,000 tons sheared plates, 100,000 tons universal plates, 50,000 tons black sheets, 20,000 tons galvanized sheets, 100,000 tons black plate for tinning, 868,000 tons other rolled products; 2,000,000 base boxes tinplates.

Bethlehem Steel Co., either directly or through a subsidiary, operates warehouses at Bethlehem and Lebanon, Pa.; Boston, Mass.; Cleveland, Ohio; and San Francisco, Cal.

IRON ORE, COAL AND LIMESTONE PROPERTIES.

Bethlehem Steel Co. owns or controls an 80.20% interest in the Cornwall Ore Banks, Cornwall Pa., with developed iron ore mine, annual cap., 1,000,000 tons; the capital stock of the Spanish-American Iron Co., which owns and operates the Daiquiri Mines, at Daiquiri, and the Mayari Mines, near Felton, Cuba, with an annual cap. of 1,500,000 tons; the capital stock of the Juragua Iron Co., which owns and operates iron ore mines near Firmeza, Cuba, annual cap., about 300,000 tons; the capital stock of the Bethlehem Chile Iron Mines Co., which controls large iron ore deposits at Tofo, near Coquimbo, Chile, annual cap., 1,500,000 tons. Bethlehem Steel Corporation owns the Bethlehem Iron Mines Co., which owns extensive iron ore deposits in Cuba.

Bethlehem Steel Corporation owns the Penn-Mary Coal Co., which owns about 16,000 acres of coal lands at Heilwood, Indiana Co., Pa., annual cap. of mines, 850,000 tons. On Oct. 29, 1919 the Penn Mary Coal Co. acquired the properties of the Elkins Coal & Coke Co. consisting of 46,244 acres coal lands in Preston and Monongalia Counties, West Virginia, with 7 active coal mines; annual cap., 700,000 tons.

Bethlehem Steel Corporation owns the Bethlehem Mines Corporation

which owns and operates limestone quarries at Bethlehem, Steelton, Lebanon and Hanover, Pa., and McAfee, N. J., annual cap., 700,000 tons.

BETTENDORF CO. (The), Bettendorf, Iowa.

Inc. Jan. 1, 1913 in Iowa. Capital stock: com. \$5,000,000; pref. 7% cum. \$2,500,000; bonds \$814,000.

J. W. Bettendorf, P. & T.; J. H. Bendixen, V. P. & G. S. M.; E. J. Bettendorf, Sec.; P. Bendixen, G. S.; F. M. Goddard, P. A.

Works at Bettendorf: blt. 1909; seven 25-ton B. O. H. fur., f. o. April 19, 1910. Fuel, crude oil.

Product: steel castings for own use and for sale; annual cap., 72,000 tons. Manufacturer of steel and wooden cars, trucks, underframes, bolsters and car specialties.

BILROWE ALLOYS CO., 1025 East F. St., Tacoma, Wash.

Inc. Dec. 13, 1915 in Washington. Capital stock: com. auth. \$1,000,000, issued \$810,730.

Henry R. Frost, P.; at 52 Broadway, New York, N. Y. J. B. Robertson, 1 V. P.; Guy S. Rowe, 2 V. P. & T.; Z. E. White, Sec. & A. T.; at Tacoma. D. A. Armstrong, A.; at Seattle.

Works at Tacoma, Wash.: blt., 1915; f. o. 1916; 6 special electric furnaces. Electric power from City of Tacoma.

Product: ferro-manganese, ferro-silicon and ferro-tungsten; annual cap., 2,500 tons of ferro-manganese.

BIRD-ARCHER CO. (The), 90 West St., New York, N. Y.

Works at Watervliet, N. Y.: installing one $\frac{1}{2}$ -ton Greaves-Etchells electric fur.; construction begun in March, 1920, to be completed in July, 1920; annual cap., 600 tons steel castings. Will manufacture high-speed tool steel and high-speed tools.

Bird Coal & Iron Co., see Northern Alabama Coal, Iron & Railway Co.

BIRDSBORO STEEL FOUNDRY & MACHINE CO., Birdsboro, Pa.

Inc. Nov., 1894 in Pennsylvania. Capital stock: com. auth. \$500,000, issued \$420,000; pref. 5% cum. auth. \$500,000, issued \$420,000.

Robert E. Brooke, P.; George Brooke, 1 V. P.; John E. McCauley, 2 V. P., G. M., G. S. & G. S. M.; D. O. Brooke, Sec. & T.; George Brooke, 3rd, A. T.; John K. Klink, P. A.

Works at Birdsboro, Pa.: blt. 1901-3; steel plant; one 30-ton B. O. H. fur.; 3 A. O. H. furnaces (two 25-ton, one 7-ton). Iron foundry; 3 cupolas and 1 air furnace, annual cap., 8,000 tons of castings, 25,000 tons of ingot moulds. Roll foundry; 2 air furnaces, 1 cupola; annual cap., 5,000 tons.

Product: steel ingots; steel castings for locomotives, ships, rolling mills, blast furnaces, hydraulic machinery, rubber machinery, etc.; annual cap., 35,000 (15,000 basic and 20,000 acid) tons ingots and 18,000 (3,000 basic, 15,000 acid) tons castings for sale and own

use; nickel, chrome and vanadium alloy steel ingots and castings; gray iron castings for general machinery; sand, chilled, steel and alloy rolls; and ingot moulds.

BIRMINGHAM-TRUSSVILLE IRON CO., Jefferson County Bank Bldg., Birmingham, Ala.

Trussville Furnace, Trussville, Ala.: 1 stack, 80' x 17' 6", blt. 1887-89, f. o. April, 1889, last rebt. 1917; 5 Whitwell stoves. Alabama coke; local ore. Company owns 300 beehive coke ovens on the furnace property; Graves coal mine, 318 acres; Labuco coal property, 2,200 acres; Oremont iron ore property, 1,130 acres; Crudup iron ore property, 1,200 acres. (Formerly held by The Michigan Trust Co., Grand Rapids, Mich., trustee for bondholders; acquired by Birmingham-Trussville Iron Co. in April, 1917.)

Product: foundry pig iron, annual cap., 70,000 tons.

BLACK STEEL & WIRE CO., 1303 Waldheim Bldg., Kansas City, Mo.

Inc. Mar. 13, 1917 in Maine. Capital stock: com. auth. \$300,000; pref. 8% cum. auth. \$300,000, issued \$250,000.

Harry W. Black, P. & G. M.; J. E. Sloan, Sc. & G. S.; at Kansas City. Clint Moore, V. P.; at Tulsa, Okla.

Sales office: Tulsa, Okla., C. H. Black, 207 Cosden Bldg.

Works at 21st St. & Manchester Ave., Kansas City: steel plant added to wire mill, construction begun July 15, 1919; one 15-ton A. O. H. fur., annual cap., 15,000 tons; 18" 3-h. 1-st. roughing, 14" 2-h. 4-st. intermediate, 12" 2-h. 8-st. finishing, annual cap., 15,000 tons billets, 32,000 tons wire rods or merchant bars (rounds, flats and concrete bars). Wire Mill; 150 wire drawing blocks for wire $\frac{3}{8}$ " to .017"; 4 barbed wire mach.; 3 wire fence mach.; 1 galv. pan.

Product and annual cap.: 10,000 net tons plain wire, 6,000 net tons galvanized wire; 2,000 net tons barbed wire, 3,000 net tons wire fencing; 3,000 net tons wire rope; 2,000 net tons high carbon crucible and plow steel rope wire.

Blackwood Steel Foundry Co., Springfield, Ohio, incorporated Aug., 1916, built a steel casting plant at Springfield in 1916, f. o. Sept. 1, 1916; acquired by The Ohio Steel Foundry Co., March 1, 1917.

BLANDON ROLLING MILL, Inc., Blandon, Pa.

Inc. March 13, 1917 in Pennsylvania. Capital stock: com. \$150,000.

F. C. Smink, P.; William Seyfert, V. P.; Samuel R. Seyfert, T., G. M. & P. A.; at Reading. S. E. Pfum, Sc. & G. S.; at Blandon.

Works at Blandon, Pa.: blt. 1867, 1 single, 6 double puddling fur.; 1 rotary squeezer; four 3-d. heat. fur.; 18" 2-h. 2-st. muck, 11" 3-h. 2-st. skelp, 8" 3-h. 3-st. skelp. (Formerly owned by Estate of Simon Seyfert; acquired by Blandon Rolling Mill, Inc., March 13, 1917.)

Product: muck and scrap bar, annual cap., 8,500 tons; skelp, flue and pipe iron, annual cap., 20,000 tons.

BLUE RIDGE IRON CO., Rock Run, Ala.

Inc. 1913 in Alabama. Capital stock: com. \$30,000.

J. H. Bass, P.; at Fort Wayne, Ind. J. M. Garvin, V. P.; D. J. Garvin, Sc. & T.; at Rock Run.

Brand: "Blue Ridge."

Blue Ridge Furnace, Tallapoosa, Ga.: 1 stack, 53' x 9'; blt. 1888-9; rebt. 1913; 1 Durham 32-pipe stove; 1 steam blowing eng. (4,000 cfm.); 2 tubular boilers, 200 H. P. Charcoal; brown hematite ore. Six charcoal kilns in Haralson Co., Ga.; annual cap., 180,000 bushels charcoal. Company owns undeveloped iron ore mine at Cedartown, Ga.

Product: warm blast charcoal pig iron; annual cap., 12,000 tons.

Boerder Steel Co. (The), Toledo, Ohio, see 1916 Directory, p. 57. The High Speed Tools Corp. purchased the process of this company and the Boerder Steel Co. is reported to be no longer in existence.

BON AIR COAL & IRON CORPORATION, Nashville, Tenn.

Inc. July, 1917 in Tennessee. Capital stock: com. \$12,500,000; pref. 7% cum. \$7,500,000.

James R. Offield, P.; at Chicago, Ill. W. J. Cummins, V. P. & G. M.; Frederic Leake, Sc.; C. J. Palmer, A. V. P.; J. O. Swingley, A. T.; W. H. Smith, A. G. M.; at Nashville. John McE. Bowman, T.; at New York City. Dr. W. B. Young, G. S.; at Bon Air, Tenn. B. F. Wilson, Jr., G. S., at Lyle, Tenn.; R. B. Doud, S. at Allens Creek; J. L. Flynn, S. Goodrich; J. L. Baxter, S. Wood Distillation Plant, Lyle.

Selling agents: Cincinnati, O., Rogers Brown & Co., Hickman, Williams & Co.; Chicago, E. C. Humphreys & Co., Whitney, Kimmerer Co.

Brands: "Mannie," "Wayne," "Standard," "Wrigley's Southern Charcoal."

Mannie Furnaces, Allens Creek, Tenn.: 2 stacks, 60' x 13'; blt. 1892-3; No. 1, f. o. April 22, 1893; No. 2, soon afterwards; 6 stoves, 60' x 16'; 4 steam blowing eng. (3,600 cfm.); 7 water-tube boilers, 2,000 H. P. Va. coke: local brown hematite ore from Company's mine at Allens Creek, annual cap., 50,000 tons. Product: high-phosphorus and high-silicon pig iron, annual cap., 50,000 tons.

Warner Furnace, Wrigley, P. O. Lyles, Tenn.: 1 stack, 72' x 18'; rebt. 1918-19; blown in April 17, 1920; 1 iron pipe stove; 2 steam blowing eng. (18,691 cfm.); 4 water-tube boilers, 1,600 H. P. Charcoal, local ores. Product: charcoal pig iron; annual cap., 24,000 tons.

Standard Furnace, Goodrich, Tenn.: 1 stack, 55' x 12', blt. 1885, rebt. 1891; iron pipe stove; 3 steam blowing eng. Coke: local brown ore from company's mines. (Formerly owned by Standard Iron Co.; acquired by Bon Air Coal & Iron Corp. Dec., 1919). Product: foundry and soft pig iron, annual cap., 24,000 tons.

The company owns coal mines at Bon Air, Ravenscroft, Eastland and Clifty, Tenn.

The company owns 200 beehive coke ovens, annual cap., 100,000 tons, at Eastland, Tenn. (idle); 20 charcoal retorts, annual cap., 3,000,000 bu., with by-product recovery plant at Lyles, Tenn. and limestone quarries at Wrigley, Tenn., annual cap., 100,000 tons; timber lands at Bon Air and Collinwood, Tenn.

Bon Air Coal & Iron Co., Nashville, Tenn., see 1916 Directory, p. 57. Company placed in hands of receivers June, 1910; sale of properties ordered by court in September, 1916; acquired by Bon Air Coal & Iron Corporation, July, 1917.

BONNEY-FLOYD CO. (The), Columbus, Ohio.
Inc. 1906.

J. L. V. Bonney, P. & T.; Walter B. Floyd, V. P., Sc. & G. M.

Works at South Columbus, on the Toledo and Ohio Central R. R.: blt. 1907; 3 side-blown converters (3-ton); f. o. Sept. 16, 1907; 1 B. O. H. fur. (15-ton). Fuel, nat. gas or oil. Adding one 3-ton Ludlum electric fur., annual cap., 5,000 tons.

Product: steel castings; annual cap., 8,000 tons converter, 7,000 tons open hearth.

BOWMANVILLE FOUNDRY CO., Ltd., Bowmanville, Ont., Canada.
Inc. 1901 in Ontario. Capital stock: pref. 10% cum. auth. \$100,000, issued \$60,000.

C. Rehder, P. & G. M.; C. E. Rehder, V. P. & P. A.; S. S. Edsall, Sc. & T.; R. Yates, G. S.

Works at Bowmanville, Ontario: blt. 1902; one 500-lb. Gronwall-Dixon electric furnace; f. o. Sept. 25, 1917. Gray iron foundry. Electric furnace used in 1918 for manufacture of pig iron from scrap.

Product: light gray iron castings; annual cap., 600 tons castings.

Braddock Machine & Mfg. Co., Braddock, Pa., see 1916 Directory, p. 58, was sold to the Braddock Manufacturing Co., Aug. 22, 1916.

Braddock Manufacturing Co. sold the works to Wilson-Snyder Mfg. Co., Dec. 24, 1919 who will dismantle the open hearth steel furnaces.

BRAEBURN STEEL CO., Braeburn, Pa.

Inc. April 12, 1897 in Pennsylvania. Capital stock: com. auth. \$400,000, issued \$365,900.

G. H. Neilson, P. & G. M.; A. E. King, T.; Durando Miller, G. S.; D. B. Smitley, P. A.; at Braeburn. H. C. Pryer, Sc.; at 347 Madison Ave., New York.

Selling agents: Edgar T. Ward's Sons Co. at Boston, Mass., Chicago, Ill., Newark, N. J., New York, N. Y., Philadelphia, Pa., Pittsburgh, Pa., and Cleveland, Ohio.

Works at Braeburn: blt. 1897; 2 crucible fur. (24-pot and 36-pot) f. o. Nov., 1897; 2 Heroult electric fur. (6-ton) f. o. 1916; 8 heat. fur. (two 1-d., four 3-d., two 4-d., coal fired); 14" 3-h. 5-st. and 10" 3-h. 5-st. bar mills; 4 box annealing fur.; 1 electric annealing

fur.; 6 steam ham. (1,000-lb. to 6,000-lb.); one 500-ton steam hydraulic forging press. Fuel, nat. and prod. gas and coal.

Product: steel ingots for own use; tungsten, vanadium and chrome alloy steel ingots; bar and tool steel; annual cap., 4,000 tons crucible, 12,000 tons electric steel ingots; 16,000 tons rolled and forged products.

Brebner, D. A., Ltd., Hamilton, Ont., Canada, was succeeded by Coralex, Ltd.

Electric furnace plant for manufacture of ferro-silicon. Works idle and Companies in process of liquidation.

Brennan Steel Castings Co., Cleveland, Ohio, see 1916 Directory, p. 59. Name changed to Aetna Steel Casting Co., June, 1916.

BRIER HILL STEEL CO. (The), Stambaugh Bldg., Youngstown, Ohio.

Inc. Jan. 29, 1912 in Ohio. Capital stock: com. auth. \$15,000,000, issued \$12,319,700; pref. 7% cum. \$5,000,000.

J. B. Kennedy, Ch.; J. H. Grose, P.; G. F. Alderdice, V. P.; J. G. Butler, Jr., V. P.; John Todd, V. P.; J. E. Parker, Sec.; N. B. Folsom, T.; C. H. Rose, C.; J. V. Schrock, A.; W. H. Warren, G. M.; P. H. Hubbard, G. S. M.; C. A. Ilgenfritz, P. A.; J. R. Stroh, M. Mines.

Sales offices:

Chicago, Joseph A. Rees, 1042 McCormick Bldg.

Cleveland, J. C. Wicks, 311 Rockefeller Bldg.

Kansas City, Mo., D. S. Rettig, 412-13 Railway Exchange.

Lynchburg, Va., W. P. Clark, 514 Krise Bldg.

New Orleans, La., A. C. White, 310 Tulane-Newcomb Bldg.

New York, W. C. Dickey, Equitable Bldg.

Philadelphia, W. L. Hoffman, 703 Morris Bldg.

Salt Lake City, E. C. Coffin, 503 Dooly Bldg.

San Antonio, Tex., Johnson Griffith Lumber Co., 204 Gibbs Bldg.

San Francisco, A. C. Rulofson, 359 Monadnock Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Product: basic, bessemer and low-phosphorus pig iron; washed metal; ingots, slabs, blooms, billets, sheet bars; sheared plates, ship, tank, flange, fire-box plates; blue annealed sheets, black and galvanized sheets; automobile, electric, deep drawing stock; formed roofing and sidings, metal shingle; galvanized and painted corrugated roofing.

Jeannette Furnace, Youngstown, Ohio: 1 stack, 83' x 22'; blt. 1917-18, blown in Sept. 21, 1918; 3 Nelson stoves, 105' x 23'; 3 steam blowing engines (2 Ingersoll-Rand Turbo and 1 Tod) 100,000 cfm.; 7 Sterling water-tube boilers, (4,800 H. P.); these engines and boilers also serve Grace Furnace; 1 Heyl & Patterson double-strand pig casting machine, which also serves Grace and Tod Furnaces.

- By-product and Conn. coke: Lake ore. Product: basic pig iron, annual cap., 195,000 tons.
- Grace Furnace; Youngstown, Ohio: 1 stack, 85' x 20' 6"; blt. 1890, rebt. 1908, relined 1919; 4 Massicks & Crooke stoves, 90' x 22'; blowing eng. and boilers described under Jeannette Furnace. By-product and Conn. coke: Lake ore. Product: basic pig iron; annual cap., 180,000 tons.
- Tod Furnace, Youngstown, Ohio: 1 stack, 80' x 20' 4½", blt. 1889, rebt., 1913, relined 1919; 5 Massicks & Crooke stoves, 80' x 16' 6"; 1 Tod steam blowing eng. (56,000 cfm.); 12 Sterling water-tube boilers (3,000 H. P.); 1 slag gran. pit, annual cap., 75,000 tons. By-product and Conn. coke: Lake ore. Product: basic pig iron, annual cap., 156,000 tons.
- Total pig iron capacity, 3 furnaces, 531,000 tons.
- Open Hearth Steel Works, Youngstown, Ohio: blt. 1912-13; first steel made Nov. 1, 1913; first products rolled Feb. 7, 1914; twelve 75-ton B. O. H. fur.; one 600-ton metal mixer; eight 4-hole soaking pits; 40" 2-h. 1-st. reversing blooming mill, 24" 2-h. 6-st. continuous billet mill, 24" 2-h. 6-st. merchant. Fuel, coal, nat. gas and prod. gas. Product: ingots, billets and sheet bars. Annual cap., 600,000 tons ingots, 510,000 tons blooms, billets, slabs and sheet bars.
- Plate Mill, Youngstown, Ohio: blt. 1917-18; 32" x 84" sheared plate mill with 1-st. 2-h. reversing and 1-st. 3-h.; 38" x 132" 3-h. sheared plate mill. Product: ship, tank, boiler and bridge plates, annual cap., 240,000 tons.
- Empire Works, Niles, Ohio: blt. 1902; f. o. Oct., 1902; 15 coal heat. fur. (7 pair, 7 sheet, 1 comb. sheet and pair); 8 black sheet mills (one 28" x 48", one 26" x 40", one 28" x 36", five 26" x 48"); 3 cold mills (two 26" x 48", one 26" x 58"); 7 box annealing fur.; 4 galv. pots (annual cap., 41,600 tons). Fuel, coal and coke. Product: black and galvanized sheets, formed roofing. Annual cap., 40,000 tons.
- Thomas Works, Niles, Ohio: blt. 1901; f. o. May, 1901; 12 comb. sheet and pair fur.; 2 gas producers; 12 black sheet mills (one 28" x 48", two 28" x 40", one 28" x 44", eight 28" x 36"); 6 cold mills (one 26" x 58", five 24" x 48"); 9 box annealing fur.; 4 pickling mach.; 6 galv. pots (62,400 tons). Fuel; coal, prod. gas and oil. Product: black sheets, flat and corrugated; galvanized, stamping, japanning, polished, automobile and electric sheets; roofing and siding. Annual cap., 50,000 tons.
- Western Reserve Works, Warren, Ohio: blt. 1914-15; f. o. Jan. 4, 1915; 6 pair and sheet fur.; two 2-h. jobbing plate mills (one 30" x 60", one 29" x 48"); 6 hot sheet mills (32" to 48"); 8 cold mills (48" to 60" inc.); 4 box annealing fur.; 2 pickling machines. Fuel, coal. (Formerly owned by Western Reserve Steel Co.; acquired by The Brier Hill Steel Co., Nov. 15, 1916). Product: black sheets for galvanizing, stamping, japanning; flat and corrugated,

polished, planished; automobile and blue annealed sheets; annual cap., 80,000 tons.

COAL, COKE AND ORE PROPERTIES.

The company owns 75% of the capital stock of the Biwabik Mining Co. and one-half interest in the Pennington Mining Co. The company also owns the Brier Hill Coke Co., which owns about 600 acres of coking coal at Brier Hill, Fayette County, Pa., with an annual cap. of 450,000 net tons of coal. It also owns the Redstone Central R. R. Co. connecting the coal property with other railroads. By-product coke plant at Youngstown, 84 Koppers by-product ovens, annual cap., 370,000 net tons. By-product recovery plant, Koppers benzol plant, annual cap., 1,870,000 gal. of light oil.

British Forgings, Ltd., Toronto, Canada, was acquired by Baldwins Canadian Steel Corp., Aug. 15, 1919.

BROOKE (The E. & G.) IRON CO., Birdsboro, Pa.

Edward Brooke, P.; George Brooke, Sc.; Robert E. Brooke, T. & G. M. Furnace Dept.; Cyrus G. Henry, S. Blast Furnaces.

Selling agents: Philadelphia, Real Estate Trust Bldg., Pilling & Crane; Boston, 176 Federal St., F. M. Trafton.

Brand: "Brooke."

Brooke Furnace, Birdsboro: 1 stack; No. 3, blt. 1873, rebt. 1910, 75' x 17'; 3 Roberts and 1 Whitwell stove; pig iron casting machine. Coke: Lake, foreign, French Creek, New York and New Jersey magnetite, ore. Dwight & Lloyd sintering plant, annual cap., 70,000 tons. Product: foundry, forge and basic pig iron, annual cap., 85,000 tons.

Birdsboro Nail Works, formerly owned and operated by this company, was sold to Reading Iron Co., Jan. 5, 1920.

BROWN & CO., Inc., Pittsburgh, Pa.

Inc. 1891. Capital stock: com. \$500,000.

J. Stuart Brown, P. & T.; James Neale, V. P.; John B. Taylor, Sc.

Sales offices:

Atlanta, Ga., 311 Candler Bldg.

Chicago, Ill., 123-125 No. Jefferson St.

New York, 2038 Grand Central Terminal.

St. Louis, Railway Exchange.

Wayne Iron and Steel Works, cor. 10th St. & Duquesne Way, Pittsburgh: blt. 1825.

Product: merchant iron bars and crucible tool steel.

Bryden Horse Shoe Co., Catasauqua, Pa., see 1916 Directory, p. 62; acquired by Manufacturers Iron & Steel Co., June 2, 1917.

Brylgon Steel Casting Co., New Castle, Del., see 1916 Directory, p. 62,

was sold to the American Manganese Steel Co., Chicago, Ill., May 26, 1916.

Buchanan Electric Steel Co., Buchanan, Mich., see 1916 Directory, p. 62, was merged with the Celfor Tool Co., Jan. 1, 1917, to form the Clark Equipment Co., Buchanan, Mich.

BUCKEYE ROLLING MILL CO. (The), Steubenville, Ohio.

Inc. Aug. 5, 1909 in Ohio. Capital stock: com. \$100,000.

Isaac M. Scott, P.; at Wheeling, W. Va. J. T. Sarratt, V. P. & T.; C. H. Dossett, Sc. & A.; at Steubenville. P. W. Jones, G. S.; at Newark, Ohio.

Sales offices:

Chattanooga, Egbert Hancock Co., James Bldg.

Chicago, Wilmer Wickersham, Peoples Gas. Bldg.

New York, A. Schroeder, 39 Cortland St.

Philadelphia, S. H. Truitt, Land Title Bldg.

St. Louis, Federal Reserve Bldg.

Newark Rolling Mills, Newark, Ohio: blt. 1897; rebt. 1907; first rail rerolled Aug. 22, 1907; 2 cont. rail heat. fur.; 18" 3-h. rail train with 1-st. roughing and 1-st. finishing rolls. Fuel, nat. gas and coal.

Product: light steel rails; annual cap., 36,000 tons.

BUCKEYE STEEL CASTINGS CO. (The), South Parsons Ave., Columbus, Ohio.

Inc. Nov. 19, 1894 in Ohio. Capital stock: com. \$1,500,000; pref. 6% non-cum. \$1,000,000.

S. P. Bush, P. & G. M.; R. S. Warner, 1 V. P.; Arno Eberlein, Sc. & T.; W. J. Bennett, A.; A. H. Thomas, G. S.; J. C. Whitridge, G. S. M.; J. E. Finneran, P. A.; at Columbus. C. B. Goodspeed, 2 V. P.; at 619 Railway Exchange Bldg., Chicago.

Sales offices:

Chicago, F. J. Cooledge, 619 Railway Exchange Bldg.

New York, J. G. Bower, 30 Church Street.

St. Paul, Geo. A. Macpherson, 871 Merchants Bank Bldg.

Works at South Columbus: blt. 1900-02; f. o. Nov., 1902; 7 B. O. H. furnaces (23-ton); one 6-ton Heroult electric fur. Fuel, nat. and prod. gas and fuel oil.

Product: car couplers, truck and body bolsters, truck side frames, draft yokes, castings for auto trucks and tractors; annual cap., 100,000 tons (94,200 open-hearth, 5,800 electric).

BUCKEYE TRACTION DITCHER CO. (The), Crystal Ave., Findlay, Ohio.

Inc. in Ohio. Capital stock: com. \$300,000.

W. F. Hosler, P.; C. L. Casterline, V. P.; C. D. Hayward, Sc. & T.; L. A. Krupp, G. S.; D. C. Royce, G. S. M.; J. J. Mahony, P. A.

Sales offices: Chatham, Ontario; Mason City, Iowa; Tulsa, Oklahoma.

Works at Findlay: 1 Snyder electric fur. (1-ton); installed 1918; f. o. Oct. 1, 1918; 1 cupola.

Product: steel castings for own use in manufacture of ditchers, clay diggers, pulling and cleaning machines and tractor pulverizers; annual cap., 600 tons steel castings; gray iron castings for own use, annual cap., 1,000 tons.

BUCYRUS COMPANY, South Milwaukee, Wis.

Inc. Nov., 1911 in Wisconsin. Capital stock: com. auth. \$5,000,000, issued \$4,000,000; pref. 7% cum. auth. \$5,000,000, issued \$4,000,000.

W. W. Coleman, P.; E. K. Swigart, 1 V. P.; W. F. Russell, 2 V. P. & C.; G. A. Morison, Sc. & G. S. M.; D. P. Eells, T.; G. W. Thexton, Works M.; P. Knoll, P. A.

Sales offices:

Birmingham, Ala., C. N. Ballentine.

Chicago, E. C. Hingston, 622 McCormick Bldg.

Cleveland, E. G. Lewis, 808 American Trust Bldg.

Minneapolis, J. N. Cawthrop, McKnight Bldg.

New York, H. J. Davis, 30 Church St.

Portland, L. T. Russell, 608 Pittock Block.

San Francisco, G. W. Whitney, 433 California St.

Works at South Milwaukee: blt. 1892; 2 B. O. H. fur. (10-ton); 3 gas prod.; 2 annealing fur.; 1 cupola. Fuel, prod. gas. Gray iron foundry. Also operates works at Evansville, Ind., for manufacture of company product. Steel and iron castings are made only at South Milwaukee Works.

Product: steel castings for sale, and for own use in the manufacture of dredges, steam shovels, railroad wrecking cranes, pile drivers, excavating machinery, etc.; steel ingots, nickel and chrome alloy steel ingots, forgings and castings. Annual cap., 20,000 tons (12,800 tons ingots, 7,200 tons castings) and 3,200 tons of gray iron castings.

Bucyrus Steel Casting Co. (The), Bucyrus, Ohio, see 1916 Directory, p. 64, was sold to the Ohio Steel Foundry Co., June 1, 1916.

BUFFALO BOLT CO., P. O. Box 969, Buffalo, N. Y.

Inc. 1897 in New York. Capital stock: com. auth. \$3,000,000, issued \$750,000; pref. 7% non-cum. \$250,000; bonds \$350,000.

J. J. Albright, P.; R. C. Board, Sc. & T.; at Marine Bank Bldg., Buffalo. R. K. Albright, 1 V. P.; Ralph Plumb, 2 V. P. & G. M.; S. B. Webster, G. S.; W. F. McKenzie, G. S. M.; D. F. Cullinan, P. A.; at North Tonawanda, N. Y.

Sales offices:

Chicago, W. J. Phalen, 1531 Monadnock Bldg.

New York, W. J. Kingsland, Inc., 21 State St.; and Topping Brothers, 122 Chambers St.

St. Louis, A. M. Jones, 1107 Chemical Bldg.

Works at North Tonawanda, N. Y.: bolt and nut works blt. 1896;

rolling mills added 1915; 4 heat. fur. (two 5-d., 2 special); 3 gas prod.; 16" 3-h. 2 st.; 14" 3-h. 1-st.; 10" 3-h. 5-st. Belgian; 6 box annealing fur.; 5 hand pickling tanks; 10 wire drawing blocks, $3\frac{1}{16}$ " to $\frac{1}{2}$ ". Electro gal. and bolt, nut and rivet plants. Fuel, coal and prod. gas.

Product: bolt and nut rods, screw stock, wire and bolts, nuts and screws; annual cap., merchant bars 25,000 tons; wire 7,500 net tons; bolts, nuts and screws 35,000 net tons.

BUFFALO STEEL CO., Tonawanda, N. Y.

Org. and inc. 1900.

J. G. Joseph, P. & T.; L. E. Block, V. P.; W. J. Kibler, Sc.

Works at Tonawanda: blt. 1900; f. o. Aug., 1900; 1 cont. heat. fur.; 2 trains (each 14" 3-h. 7-st. rerolling). Fuel, coal.

Product: bessemer steel bars, angles, channels, tees, steel fence posts, and special shapes for agricultural implements and other purposes. Annual cap., 40,000 tons.

BUFFALO UNION FURNACE CO., Buffalo, N. Y.

Inc. Nov. 2, 1900 in New York. Capital stock: com. \$1,000,000; pref. 7% cum., auth. \$200,000, issued \$60,000; bonds \$920,000. Frank B. Baird, P.; Harry Yates, 1 V. P. & T.; C. A. Collins, 2 V. P.; F. C. Slee, Sc.; B. Marron, G. M.; J. J. Sammon, G. S.; E. P. Hannig, P. A.

Sales offices:

Cleveland, Ohio, M. A. Hanna & Co.

Buffalo, N. Y., F. C. Mosedale, Marine Bank Bldg.

Erie, Pa., Walter Morrow.

Pittsburgh, Pa., B. S. Stephenson, Oliver Bldg.

Toronto, Ont., Canada, G. A. Maltby, 703 C. P. Ry. Bldg.

Brand: "Buffalo."

Furnaces A, B, & C, at Buffalo: Furnace A, 80' $5\frac{1}{2}$ " x 18' 6"; blt. 1892; f. o. Feb. 25, 1893; relined Dec., 1918; four two-pass stoves, 3 side, one center-comb. (18' x 80"); Furnace B, 82' 2" x 19'; blt. 1897-8; f. o. 1899; rebld. 1914; relined Jan., 1917; four 2-pass side combustion stoves (80' x 20"); Furnace C, 80' 7" x 18' 6"; blt. 1899-1900; new shell April, 1917; f. o. on charcoal June 18, 1901; last charcoal pig iron made Aug. 23, 1904; fuel changed to coke 1904; first coke iron made Dec. 6, 1904; three 3-pass center combustion McClure stoves (80' 7" x 18' 6"); 7 steam blowing eng. (128,000 cfm.), 2 Curtis steam turbines (60,000 cfm.); 23 boilers (21 water-tube 2 tubular) 6,280 H. P.; 3 slag gran. pits, annual cap., 175,000 tons; 1 double-strand Pittsburgh Coal Washer Co. casting machine; 1 General Briquetting Co. briquetting plant, for flue dust, annual cap., 22,000 tons. Conn. coke: Lake ore.

Product: malleable, bessemer, foundry and basic pig iron; annual cap., 350,000 tons.

The Buffalo Union Furnace Co. owns one-half interest in the Buffalo

Iron Mining Co. of Iron River, Mich., which is developing a mine with probable annual cap. of 200,000 tons.

BUHL MALLEABLE CO., Wight and Adair Sts., Detroit, Mich.

Inc. Aug. 11, 1900 in Michigan. Capital stock: com. \$460,000. A. H. Buhl, P.; L. D. Buhl, V. P.; A. S. Keen, 2 V. P.; S. A. Commons, Sec. & T.; P. J. McManus, G. M.; H. B. Strate, G. S.; F. J. Rademacher, P. A.

Works at Wight and Adair Sts., Detroit: blt. 1899; first O. H. steel made May, 1913; one 5-ton A. O. H. fur.; 1 cupola; one 5-ton malleable steel fur.; 3 malleable iron fur.

Product: acid open hearth steel, malleable steel and malleable iron castings for sale; gray iron castings for own use only; castings for automobiles, motor trucks, pneumatic tools and railway and agricultural castings. Annual cap., 2,000 tons of steel castings, 1,000 tons of malleable steel castings and 10,000 tons of malleable iron castings. Steel department especially equipped for small castings.

Buhl Stamping Co., Detroit, Mich., see 1916 Directory, p. 66; manufacture of charcoal tinplates from purchased black plate discontinued in 1916.

BURDEN IRON CO. (The), Troy, N. Y.

Inc. June 30, 1881 in New York. Capital stock: com. \$2,000,000. James A. Burden, P.; William P. Burden, V. P.; Robert Forrest, Sec. & T.; William E. Millhouse, M.; James D. Keith, Horse Shoe S. M.; at Troy, N. Y. John C. Kuhns, M. of R. R. Sales; at Railway Exchange Bldg., Chicago.

Burden Iron Works, Troy, N. Y.: est. 1813; 36 double puddling fur.; 2 busheling fur.; 4 squeezers; 13 heat. fur. (five 2-d., three 3-d., four 4-d., and 1 reversible); 2 gas producers; three 20" 2-h. 3-st. muck; 14" 3-h. 5-st.; 10" 3-h. 4-st.; three 9" 3-h. 4-st.; 20" 2-h. 3-st. finishing mills. Fuel, powd. coal and prod. gas. Rivet works and horseshoe factory.

Product: merchant bars, staybolt iron, engine bolt iron, chain iron and iron boiler rivets and horseshoes, annual cap., 47,000 tons of bars, 150,000 kegs (100-lb.) of rivets, $\frac{1}{2}$ " to $1\frac{1}{4}$ " dia.

Burden Furnace, Troy, N. Y.: 1 stack; 75' x 18', blt. 1905-06, f. o. May 27, 1906; relined 1917; 4 hot blast stoves (one 84' x 20', three 65' x 16'); 2 steam blowing eng., (36,000 cfm.); 13 tubular boilers, 1,950 H. P. Coke; Lake and Adirondack ores.

Product: foundry pig iron and ferro-manganese; annual cap., pig iron, 100,000 tons, ferro-manganese, 35,000 tons.

BURLINGTON STEEL CO., Ltd., Sherman Ave. North, Hamilton, Ont., Canada.

Inc. 1910. Capital stock: com. \$500,000.

Sir Frank W. Baillie, P.; George A. Morrow, 1 V. P.; Frank P. Wood, 2 V. P.; at Toronto, Ont. P. Acheson, T. & P. A.; H. V.

Hamilton, G. M.; P. H. Brooks, Sc.; A. Oram, G. S.; at Hamilton.

Selling agents: N. Bruce Campbell, Winnipeg, Man., Canada.

Works at Hamilton: blt. 1910, f. o. May 1, 1911; one 4-d. coal-fired heat. fur.; 1 cont. rail reheat. fur.; 1 forge fire; two 12" 3-h. 7-st. rail slitting guide mills; one 8" 3-h. 3-st. guide mill. Fuel, coal.

Product: merchant and concrete bars, rounds, squares, flats, angles, channels, agricultural shapes and special sections; annual cap., 50,000 tons.

BURNSIDE STEEL CO., 632 Railway Exchange Bldg., Chicago, Ill.
Inc. Sept. 27, 1916 in Illinois. Capital stock: com. \$300,000; bonds \$15,000.

H. F. Wardwell, P.; George L. Pollock, 1 V. P. & T.; John Fletcher, 2 V. P.; W. A. Spuehler, Sc. & P. A.; L. M. Bassini, G. S.

Plant at 1300 East 92nd St., Chicago: blt. 1916; f. o. April 1, 1917; 2 Tropenas converters (one 1-ton and one 2½-ton); 2 cupolas.

Product: automobile, tractor, and machinery steel castings for sale; annual cap., 4,800 tons.

BYERS CO. (A. M.), 235 Water St., Pittsburgh, Pa.

Inc. July 9, 1903 in Pennsylvania. Capital stock: com. auth. \$3,500,000, issued \$3,000,000; pref. 7% cum. \$3,500,000.

E. M. Byers, P.; J. F. Byers, 1 V. P.; L. M. Johnston, 2 V. P. & G. M.; C. L. Jamison, Sc. & T.; T. L. Lewis, S. M.; N. Bowland, Advertising M.; H. E. Gross, G. S.; J. E. Stauffer, P. A.; at Pittsburgh. S. K. Hine, G. M.; at Girard, Ohio.

Sales offices:

Boston, 11 Sleeper St.

Chicago, 1520-21 McCormick Bldg.

Cleveland, 411 Perry Payne Bldg.

Dallas, Texas, American Exchange Nat. Bank Bldg.

New York, 295 Broadway.

Sales agencies in the principal cities.

Works at 6th & Bingham Sts., South Side, Pittsburgh: originally blt. 1862-3; 29 single puddling fur.; 1 squeezer; 3 reverb. heat. fur. (one 3-d. and two 4-d.); 21" 3-h. 1-st. muck mill; 17" 2-h. 3-st. skelp mill. Fuel, pulv. coal, and nat. gas. Product: muck bar and skelp for own use; annual cap., 22,000 tons of muck bar and 34,000 tons of skelp. Pipe mill department contains 1 butt-weld; 2 lap-weld mills; and 1 galv. pot. Fuel, gas. Product: butt-weld pipe ¼" to 1½"; lap-weld pipe 1¼" to 12½". Annual cap.: black pipe 65,000 tons, galvanized pipe 25,000 tons; total 90,000 tons.

Mattie Furnace, Girard, Ohio: 1 stack, 82' x 19½'; blt. 1866; last remod. 1918, relined 1919; 3 Foote stoves, 95' x 20' and 1 Massicks and Crooke stove, 90' x 20'; 3 steam blowing eng. (45,000 cfm.); 10 water-tube boilers (3,822 H. P.); 1 slag gran. pit, annual cap.,

92,000 tons. Conn. coke; Lake ore. (Formerly leased by the A. M. Byers Co. of Ohio from Heirs of A. M. Byers; acquired by A. M. Byers Co., Jan. 30, 1918). Product: foundry and forge pig iron; annual cap., 132,000 tons.

Rolling Mill, Girard, Ohio: blt. 1909; first muck bar rolled Jan. 26, 1909; first skelp rolled Feb. 22, 1909; first plates rolled May 15, 1911; 88 single puddling fur.; 2 squeezers; four 4-d. regen. heat. fur.; 3 gas prod.; two 21" 3-h. 1-st. muck, one 3-h. Belgian skelp with 16" 1-st. roughing and 12" 3-st. finishing, one 26" x 76" plate mill with one 2-h. roughing and one 3-h. finishing stand used for rolling skelp. Fuel, prod. gas and coal. (Formerly leased by the A. M. Byers Co. of Ohio from Heirs of A. M. Byers; acquired by A. M. Byers Co., Jan. 30, 1918.)

Product: muck bar and grooved skelp for own use in the manufacture of wrought iron pipe; annual cap., muck bar 53,000 tons, skelp 63,000 tons.

Byers Co. (The A. M.) of Ohio, Girard, Ohio, see 1916 Directory, p. 68, was taken over by the A. M. Byers Co., Pittsburgh, Pa., Jan. 30, 1918.

BY-PRODUCTS COKE CORPORATION, P. O. Drawers 1 & 2, Syracuse, N. Y.

Inc. 1905 in New York. Capital stock: com. auth. \$10,000,000, issued \$8,637,148; bonds \$3,025,000.

H. H. S. Handy, P.; E. L. Pierce, V. P.; E. D. Winkworth, Sc.; M. D. Whitford, T.; A. D. Allibone, A.; J. A. Whaling, P. A.; at Syracuse. C. T. Boynton, V. P.; G. H. Beaumont, V. P.; C. D. Caldwell, V. P.; W. W. Davis, M. Coke Ovens Dept.; W. H. Allen, Jr., S. Coke Ovens; D. L. Ward, S. Blast Furnaces; at Chicago.

Selling agents: Pickands, Brown & Co.; Peabody Coal Co. (agents); Globe Coal Co.; at Chicago.

Brand: "Federal."

Federal Furnaces, 108th St. & Calumet River, South Chicago: 2 stacks; "A," 80' x 18' 6", blt. 1905-06, f. o. Feb. 1, 1907; "B," 80' x 21' 1", blt. 1907-9, f. o. Aug. 20, 1909, relined 1919; 8 Kennedy stoves (80' x 20'); 6 steam blowing eng. (100,000 cfm.); 16 water-tube boilers, 5,520 H. P.; 1 double-strand Heyl & Patterson pig casting machine. By-product coke; Lake ores.

Product: malleable, basic and bessemer pig iron; annual cap., 273,750 tons.

Company owns and operates coal mines at West Frankfort, Ill., and by-product coke plant at South Chicago, Ill., consisting of 280 Semet-Solvay ovens, annual cap., 975,000 net tons coke.

CALUMET & HECLA MINING CO., Calumet, Mich.

Inc. 1871 in Michigan.

R. L. Agassiz, P.; at Boston, Mass. James MacNaughton, V. P. & G. M.; at Calumet.

Company is engaged in mining and smelting of copper ore. Operates a small steel casting plant for own use only.

Foundry at Calumet, Mich.: blt. 1907; 3 single pot crucible fur.; 2 cupolas; one 3-ton Gronwall-Dixon electric fur. used for desulphurizing molten iron from cupolas. Fuel, oil and coke. Gray iron and brass foundry.

Product: steel, brass, bronze and aluminum castings for the use of the company exclusively; gray iron, chilled iron and semi-steel castings.

CALUMET STEEL CO., 208 South La Salle St., Chicago, Ill.

Inc. Mar. 27, 1907 in Illinois. Capital stock: com. \$400,000.

J. H. Porter, P.; A. S. Hook, V. P. & T.; S. S. Porter, Sc.; at Chicago. F. N. Prime, A.; L. H. Hook, G. S.; at Chicago Heights.

Works at Chicago Heights: blt. 1907-08; f. o. Feb. 28, 1908; 2 heat. fur. (one 4-d. and one cont.); two 14" 3-h. 7-st. and one 8" 3-h. 5-st. guide mills. Fuel, pulv. coal and fuel oil.

Product: bessemer steel bars, angles, channels, tees, cultivator bars, structural tubing and Ankorite steel fence posts; annual cap., 50,000 tons.

CAMBRIA STEEL CO., Widener Bldg., Philadelphia, Pa.

Inc. Aug. 27, 1901 in Pennsylvania. Capital stock: com. auth. \$50,000,000, issued \$45,000,000.

Controlling interest acquired by Midvale Steel & Ordnance Co. in February, 1916.

A. C. Dinkey, Ch.; A. A. Corey, Jr., P.; William B. Dickson, V. P.; John C. Neale, V. P. & G. M. S.; L. R. Custer, V. P.; D. Brewer Gehly, Sc. & T.; L. K. Kruse, A. T.; P. B. Burtis, A. Sc.; J. M. Milliken, A.

Sales offices:

Atlanta, Candler Bldg.

Boston, 40 Court St.

Chicago, McCormick Bldg.

Cincinnati, Union Trust Bldg.

Cleveland, Swetland Bldg.

Detroit, Penobscot Bldg.

New York, 165 Broadway.

Philadelphia, Widener Bldg.

Pittsburgh, Oliver Bldg.

St. Louis, Chemical Bldg.
Salt Lake City, Newhouse Bldg.
San Francisco, Monadnock Bldg.
Seattle, Colman Bldg.

Washington, D. C., Woodward Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Product: bessemer, basic, foundry and low-phosphorus pig iron, spiegeleisen and ferro-manganese; steel ingots; forging ingots, blooms, billets and slabs; tinplate bars; steel T rails from 12 pounds to 130 pounds per yard, crane runway rails to 150 pounds per yard, contact rails, guard rails, T rail guards; plain and angle splice bars, reinforced angle bars, 100% rail joints, finished in ordinary method or heat-treated; track bolts and nuts, pressed steel rail braces, frog fillers, tie plates; Slick mine ties; steel axles for passenger, freight, street and mine cars and for tender trucks and locomotives; crank pins and piston rods; machine bolts; nuts, rivets and pipe or tank bands with rolled threads; angles, channels, beams and other structural shapes; universal and sheared plates; all kinds of steel and composite freight cars, car parts, and car and other steel forgings; rolled steel wheels, passenger, freight, street car and crane wheels, wheel blanks, gear blanks, turbine discs, annular sections, couplings, etc.; tire, toe calk, rounds, squares, hexagons, octagons, and other special shapes; plain, concave and baby carriage spring steel; Slick deformed concrete bars; automobile rim, window sash and other special sections; cold drawn and turned shafting; small forgings, special springs, and railway appliances; bar and-slab plow steel, flat plow shapes, flat and finished cultivator shapes, fingerbars, knife backs, rake teeth, spring harrow teeth and other agricultural specialties; steel discs 10" to 20" with rolled bevel for harrows, drills and cultivators; beveled discs 23" to 28" for plows; discs for auto wheels; coulters 8" to 24" dia; pressed steel seats for agricultural implements; wire rods, bright, galvanized and annealed wire; common, cement coated, galvanized and blued wire nails; staples, bale ties, barbed wire, galvanized field and poultry fencing; sulphate of iron.

Properties: the Cambria Steel Co. owns the lease for a term of 999 years of the Cambria Iron Co. which owns 2 blast furnace plants and 5 rolling mill plants, etc.; at Johnstown, Pa. The Cambria Iron Co. owns stock interests, held by it subject to the terms of the lease to the Cambria Steel Co., in the following companies:

Penn Iron Mining Co. of Michigan (100%).
Penn Iron Mining Co. of Wisconsin (100%).
Mahoning Ore & Steel Co. (50%).
Juniata Limestone Co., Ltd. (62½%).
Cambria Inclined Plane Co. (100%).

The Manufacturers Water Co. (100%).

Johnstown Water Co. (51%).

The Cambria Steel Co. owns directly stock interest in Cambria Steamship Co. (50%); Mahoning Steamship Co. (50%); Johnstown Steamship Co. (100%); Beaver Steamship Co. (100%); and Juniata Limestone Co. (37½%).

BLAST FURNACES.

Cambria Plant, Johnstown, Pa.: 6 stacks; No. 1 to No. 4, blt. 1853-54; No. 1, 91' x 21', last rebt. 1914; No. 2, 91' x 21', last rebt. 1901, remodeled 1914; No. 3, 91' x 21', last rebt. 1914; No. 4, 91' x 21', last rebt. 1913; No. 5, 87' x 22', blt. 1873-76, last rebt. 1902, remodeled 1914; No. 6, 87' x 22', blt. 1879, last rebt. 1903, remodeled 1914; 29 two-pass side-comb. stoves; 16 steam blowing eng. (300,000 cfm.); 66 tubular boilers, 19,100 H. P.; 3 Heyl & Patterson double-strand pig casting mach.; 125' rotary kiln 10' dia., for nodulizing fine ore and flue dust, annual cap., 72,000 tons; 3 slag granulating pits.

Franklin Plant, Johnstown, Pa.: 5 stacks; No. 7, 85' x 22', blt. 1903-06, f. o. Jan. 17, 1906, remodeled 1914; No. 8, 85' x 22', blt. 1906-07, f. o. Aug. 7, 1907, remodeled 1914; No. 9, 85' x 22', blt. 1916, f. o. June 6, 1916; No. 10, 85' x 22', blt. 1916-17, f. o. May 7, 1917; No. 11, 85' x 22', blt. 1917, f. o. July 3, 1917; 20 two-pass center-comb. stoves (100' x 24'); 7 steam blowing eng.; 3 steam turbo-blowers; 1 gas blowing eng. (280,000 cfm.); 46 tubular boilers, 18,480 H. P.; 2 Heyl & Patterson pig casting mach.; slag granulating pits. By-product and Conn. coke: Lake ore. Foreign and native manganese and manganiferous ore. Product: bessemer, basic, foundry and low-phosphorus pig iron, spiegeleisen and ferro-manganese. Total annual cap. of the 11 furnaces, 1,700,000 tons.

STEEL WORKS AND ROLLING MILLS.

Cambria Plant, Johnstown, Pa.: orig. blt. 1853, first bessemer steel July 10, 1871, first O. H. steel 1879; 4 Bessemer converters (12½-ton); 7 B. O. H. fur. (three 30-ton, four 50-ton); 1 A. O. H. fur. (30-ton); 8 ingot heat. fur.; 7 regen. heat. fur. (six 5-d., one 6-d.); 3 cont. heat. fur.; 8 reverb. heat. fur. (two 3-d., six 4-d.); 48" 2-h. 1-st. blooming; 40" 2-h. 1-st. blooming; 28" 3-h. 3-st. rail, 30" 3-h. 4-st. structural, slab and billet; 22" 3-h. 3-st. structural, 22" 3-h. 2-st. special shape, 18" cont. billet with 22" 2-h. 4-st. and 18" 2-h. 8-st.; 22" 2-h. 1-st. axle round. Car axle dept.: annual cap., 40,000 tons. Steel foundry, general castings, alloy steel castings and rolls for own use only, annual cap., 5,000 tons.

Franklin Plant, Johnstown, Pa.: blt. 1900-01; f. o. Apr. 30, 1901; 22 B. O. H. fur. (75-ton); 19 soaking pits (304 ingots total); 10 regen. slab. heat. fur. (3-d.); 40" 2-h. 1-st. blooming; 34" 2-h. 2-st.

universal slabbing; 32" 2-h. 1-st. round mill; two 134" sheared plate mills; 8 hammers (200-lb. to 1,100-lb.). Fuel, coal, oil, coke and blast furnace gas. Bolt, nut and rivet dept.: bolts $\frac{3}{8}$ " to 3", nuts $\frac{3}{8}$ " to 2 $\frac{1}{4}$ ", rivets $\frac{3}{8}$ " to 1 $\frac{1}{4}$ ", pipe bands, brake pins, annual cap., 15,000 tons. Steel carbuilding dept.; 3 hydraulic presses (550-ton, 1,000-ton, 2,100-ton); annual cap., 15,000 cars. Structural shop; annual cap., 36,000 tons.

Gautier Plant: blt. 1878; 15 cont. heat. fur.; 20" 3-h. 2-st., 14" 3-h. 8-st., 13" 3-h. 3-st., 12" 3-h. 9-st., 12" 3-h. 5-st., 10" 3-h. 8-st., 9" 3-h. 8-st., 9" 3-h. 6-st., 8" 3-h. 9-st., 8" 3-h. 7-st., 8" 3-h. 7-st., bar mills; 24" universal plate mill; 22" sheared plate mill; 11 drop hammers (600-lb. to 2,500-lb.). Washer and forged spike shop. Cold drawing and cold-rolling shop with 12" 3-h. 1-st. cold mill. Rake shop, making agricultural machinery parts. Shear shop for plow and cultivator shapes. Disc shop for harrow, plow, drill and auto wheel discs and pressed steel seats.

Wire Mills: blt. 1910-11, f. o. Feb. 15, 1911; one cont. heat. fur.; Morgan continuous double strand rod mill with 12" 2-h. 6-st. roughing, 10" 2-h. 10-st. finishing; 196 wire drawing blocks for wire $\frac{1}{2}$ " to 30 gauge; 2 galv. fur.; 30 barbed wire mach.; 10 fence mach.; 115 wire nail mach. Product and annual cap.: 120,000 tons wire rods; 95,000 tons wire, 40,000 tons galvanized wire, 12,700 tons barbed wire, 30,000 tons wire fencing, 900,000 kegs wire nails, 2,400 tons copperas.

Wheel Plant: blt. 1917-18; 3 wheel mills, No. 1 and No. 2, f. o. Feb., 1918, No. 3 building. No. 1 mill: 1 Slick rolling mill, 1 punch and fin cutter, 1 manipulator, 1 tread rolling mach., 8 annealing pits, 3 heat. fur. and complete machine shop equipment. No. 2, mill: 1 rolling mill; 1 dishing press, two 12,000-ton presses, 2 hub punching presses, 4 heat. fur. and machine shop. Product: wheels, 15" to 42", annual cap., 300,000 wheels.

Total annual capacity of 5 rolling mills and steel works; 1,900,000 tons ingots (700,000 tons bessemer, 1,200,000 tons open hearth); 1,400,000 tons hot rolled products including 300,000 tons rails, 120,000 tons wire rods, 980,000 tons structural shapes, plates and merchant bars.

COAL, COKE AND IRON ORE PROPERTIES, ETC.

Cambria Steel Co. operates extensive coal mines in Cambria Co. and one gas coal mine in Westmoreland Co., Pa., estimated total annual cap., 2,400,000 tons.

At the Franklin Plant there are 492 by-product coke ovens with by-product recovery plant and Edison benzol plant; annual cap., 1,000,000 net tons coke, 2,000,000 gals. light oil. Rosedale Coke Plant: 120 by-product ovens (60 under construction) with complete by-product recovery plants, annual cap., 360,000 net tons coke.

Cambria Steel Co. controls the Penn Iron Mining Co., operating iron ore mines in the Menominee Range in Michigan; and the Mahoning Ore & Steel Co., which operates the Mahoning Mine on the Mesabi Range in Minnesota.

Cambria Steel Co. owns one-half of the capital stock of the Cambria Steamship Co., which operates two vessels of 11,000 tons capacity each; one-half the capital stock of the Mahoning Steamship Co., which operates 3 vessels of 9,500 tons capacity each; and the entire capital stock of the Johnstown Steamship Co. and the Beaver Steamship Co., which operate eight vessels of 9,500 tons capacity each.

Cambria Steel Co. also controls the Juniata Limestone Co., Ltd., which operates limestone quarries at Carlisle, Blair Co., Pa., and leases and operates the Naginney limestone quarries in Mifflin Co., Pa.

Cambridge Co., Riverside, N. J., see 1916 Directory, p. 73; was sold to The National Lock Washer Co. in March, 1918.

CANADA CEMENT CO. (Ltd.), Herald Bldg., Montreal, P. Q., Canada.

Inc. Aug. 29, 1909 in Canada. Capital stock: com. auth. \$19,000,000, issued \$13,500,000; pref. 7% cum. \$11,000,000, issued \$10,500,000; bonds, \$7,448,680.

W. C. Edwards, P.; at Ottawa, Ont. J. M. Kilbourn, V. P.; at Owen Sound, Ont. F. P. Jones, V. P. & G. M.; H. L. Doble, Sc., T. & C.; F. B. Kilbourn, G. S.; J. D. Johnson, G. S. M.; M. A. Hoey, P. A.; at Montreal.

The company is engaged principally in the manufacture of Portland cement; also owns the steel plant at Montreal, described below, built to manufacture steel for munitions.

Sales offices:

Calgary, Burns Bldg.

Toronto, Traders Bank Bldg.

Winnipeg, McArthur Bldg.

Works at Kilbourn Siding, Montreal: steel fur. installed Dec., 1915; first open hearth steel made July, 1916; first electric steel made April, 1916; 2 B. O. H. fur. (15-ton); 4 special electric fur. (7-ton).

Product: steel ingots; annual cap., 35,000 tons.

CANADA ELECTRIC CASTINGS CO., Ltd., P. O. Box 703, Orillia, Ontario, Canada.

Inc. Dec. 15, 1919 in Province of Ontario.

Capital stock: com. auth. \$40,000, issued \$15,000.

J. B. Tudhope, P.; B. C. Lamble, Sc., T. & G. M.; E. Lamble, A.; T. W. Stephens, G. S.

Works at Orillia: construction begun Nov. 25, 1919 to be completed about Feb. 1, 1920; one 3,000-lb. electric fur. Gray iron foundry.

Product: steel castings, nickel, chrome, manganese, tungsten and molybdenum alloy steel castings, annual cap., 750 tons; gray iron castings, 300 tons.

Canada Iron Foundries, Ltd., Montreal, Canada, see 1916 Directory, p. 73. Midland furnaces sold; stack No. 1 sold to Midland Iron & Steel Co., May 1, 1918; stack No. 2 sold to Algoma Steel Co., Feb. 15, 1917 and removed to Sault Ste. Marie.

CANADIAN BRAKESHOE CO., Ltd., Sherbrooke, P. Q., Canada.

Inc. Oct., 1912 in Dominion of Canada.

P. McCullough, P.; H. V. Haight, V. P.; E. W. Jones, Sc. & T. Works at Sherbrooke: blt. 1912-13; f. o. Nov., 1913; 3 electric fur. (2-ton). Gray iron and brass foundry.

Product: steel ingots, steel castings for sale, gray iron castings for sale and own use; annual cap., 2,500 tons steel ingots or 2,000 tons steel castings.

CANADIAN CAR & FOUNDRY CO., Ltd., 120 St. James St., Montreal, P. Q., Canada.

Inc. Oct. 29, 1909 in Dominion of Canada. Capital stock: com. auth. \$5,000,000, issued \$4,975,000; pref. 7% cum. \$7,500,000; bonds \$5,223,133.

Hon. Nathaniel Curry, Ch.; W. W. Butler, P.; D. P. Lamoreux, V. P.; A. Whyte, V. P. & T.; A. D. Neale, V. P.; A. C. Bourne, Sc.; L. A. Peto, C.; A. J. Canfield, G. S.; D. R. Arnold, S. M.

Product: steel, steel-underframe, and wooden freight and passenger cars of all types.

The Canadian Car & Foundry Co. was formed in Nov., 1909, to consolidate the carbuilding works of Rhodes, Curry & Co., Ltd., the Canada Car Co., Ltd., and the Dominion Car & Foundry Co., Ltd. The Company operates three car-building plants: Amherst Works, Amherst, N. S.

Dominion Works, Dominion, near Montreal, P. Q.

Turcot Works, near Montreal, P. Q.

Amherst Works, Amherst, N. S.: orig. blt. 1893; rolling mill dept. blt. 1906-07; first rolled products April 18, 1907; 2 busheling fur.; four 4-d. heat. fur.; 18" 3-h. 3-st. bar; 16" 3-h. 3-st., and 9" 3-h. 4-st. Belgian; 2 galv. pots; 1 forge fire; 6 steam ham. (500-lb. to 8,000-lb.); 2 hydraulic presses (350-ton); 6 bulldozers; 2 nut mach.; 1 oil fur. for nut mach. Gray iron and car wheel foundries, machine shop, planing mill and car-building shops.

Product: scrap bar, merchant bars, bolt, nut and rivet rods, nuts (3/8" to 1 1/2" sq.), rivets and bolts; freight car forgings; annual capacity; scrap bar, 5,700 tons; merchant bars, 21,600 tons; rods, 1,400 tons; nuts 2,200 kegs (200-lb. keg.); rivets, 1,800 kegs; bolts, 3,800 kegs; car axles, 13,000 tons; misc. forgings, 9,000 tons.

CANADIAN CARBORUNDUM CO., Ltd., Niagara Falls, N. Y.

Inc. 1916 in Province of Ontario, Canada. Capital stock: com. \$100,000. Formerly known as Canadian Aloxite Co., Ltd., name changed to Canadian Carborundum Co., Ltd., Jan. 10, 1920.

F. J. Tone, P.; George R. Rayner, V. P. & Sc.; F. H. Manly, T.; C. H. Greenwood, Works M.; S. S. Diemer, P. A.

Works at Shawinigan Falls, P. Q.: one three-phase arc electric fur.; f. o. 1918. Power from the Shawinigan Water & Power Co.

Product: 90% ferro-silicon; annual cap., 2,125 tons.

CANADIAN FERRO ALLOYS, Ltd., 165 Broadway, New York, N. Y.

Inc. April, 1918 in Province of Quebec, Canada. Capital stock: com. \$250,000.

E. P. Earle, P.; D. P. Earle, T.; at New York, N. Y. Edwin Corning, V. P.; H. G. Batcheller, Sc.; at Watervliet, N. Y. F. A. Raven, G. M.; at Shawinigan Falls, P. Q., Canada.

Sales office: New York, Corning & Co. Inc., 165 Broadway.

Works at Shawinigan Falls, P. Q., Canada: blt. 1918; f. o. 1918; 1 special type electric fur. Power from Shawinigan Water and Power Co.

Product: ferro silicon; annual cap., 5,000 tons.

CANADIAN FURNACE CO., Ltd., 51 Hamburg St., Buffalo, New York.

Inc. Mar. 21, 1912 in Ontario, Canada. Capital stock: com. auth. \$1,500,000, issued \$500,000; bonds \$200,000.

Frank B. Baird, P.; Harry Yates, 1 V. P. & T.; C. A. Collins, 2 V. P.; F. C. Slee, Sc.; H. T. McDougal, A.; B. Marron, G. M.; E. P. Haning, P. A.; at Buffalo. F. E. Deschenes, G. S.; at Port Colborne, Ont.

Selling agents: Cleveland, Ohio, M. A. Hanna & Co.; Buffalo, N. Y., F. E. Mosedale, Marine Bank Bldg.; Toronto, Ont., Canada, George A. Maltby, 703 Canadian Pacific Ry. Bldg.

Brand: "Victoria."

Victoria Furnace, Port Colborne, Ont., Canada: 1 stack, 82' 2½" x 19' 6"; blt. 1912-13; f. o. Sept. 27, 1913; relined 1916; four 2-pass stoves, 80' x 20'; 3 steam blowing eng. (51,300 cfm.); 8 water-tube boilers (2,400 H. P.); one slag granulating pit, annual cap., 60,000 tons. Conn. coke: imported Lake ore.

Product: foundry, scotch, bessemer and malleable pig iron; annual cap., 125,000 tons.

CANADIAN HORSE SHOE CO., Ltd., Hamilton, Ont., Canada.

Org. and inc. March, 1915. Capital stock: com. \$300,000.

L. M. McElroy, P.; H. H. Hanchett, Sc. & T.; at Erie, Pa.

P. J. Smith, V. P.; at Selkirk, Manitoba, Canada.

Works at Hamilton, Ont.: blt. 1915-16; 3 heat. fur. (one 3-d., two 4-d.); 9" 3-h. 5-st. merchant mill; 2 forging presses. Fuel, coal. (Plant idle).

Product: scrap bar; horseshoe bars; horse and mule shoes; annual cap., 5,000 tons scrap bar, 5,000 tons horseshoe bar.

CANADIAN ROLLING MILLS, Ltd., 107 Hamilton St., Montreal, P. Q., Canada.

Inc. Dec. 17, 1912 in the Dominion of Canada. Capital stock: com. \$505,000; bonds \$211,500.

James L. Waldie, P. & G. M.; J. W. McConnell, V. P.; H. Worrall, Sc. & T.; W. L. Davies, A. & C.; William Mosley, G. S.; A. H. Hough, G. S. M.; F. Dease, P. A.

Sales offices:

Halifax; St. John, N. B.; St. Johns, Nfld.; Toronto; Vancouver; Victoria; Winnipeg; and Montreal.

Works at Lachine Canal, Montreal: blt. 1913; f. o. Mar. 9, 1914; one sand bottom busheling fur.; 5 4-d. reverb. fur.; 18" 3-h. 3-st. bar and muck mill; 16" 3-h. 2-st. roughing; 10" 3-h. 2-st. merchant mill; 2 steam ham. (500-lb., 3-ton). Fuel, coal.

Product: merchant and concrete bar, scrap bar, spike rods, ship and railway spikes, $2\frac{1}{2}" \times \frac{5}{16}"$ up to $12" \times \frac{5}{8}"$; annual cap.; scrap bar, 6,000 tons, merchant bar, 18,000 tons, ship and railway spikes, 3,000 kegs (200-lb.).

CANADIAN STEEL CORPORATION, Ltd., Ojibway, Ontario, Canada.

Inc. 1913 in Dominion of Canada. Subsidiary of the United States Steel Corporation.

E. H. Gary, P.; W. J. Filbert, Sc. & A.; Richard Trimble, T.; at 71 Broadway, New York. Ward B. Perley, V. P.; Frank Parrish, P. A.; at Ojibway.

Works at Ojibway, Essex Co., Ontario, under construction.

CANADIAN STEEL FOUNDRIES, Ltd., 120 St. James St., Montreal, P. Q., Canada.

Inc. Dec. 27, 1910 in Dominion of Canada. Capital stock: com. \$3,000,000; pref. 7% cum. auth. \$2,000,000, issued \$1,400,000; bonds \$2,334,929.

W. W. Butler, P.; W. S. Atwood, V. P. & G. M.; D. P. Lamoreux, V. P.; A. Whyte, T.; A. C. Bourne, Sc.; L. A. Peto, C.; J. I. Reid, Operating M.; W. W. Horwood, S. M.; A. D. Neale, P. A.

Sales office: Toronto, George H. Richmond, Royal Bank Bldg.

Brand: "C. S. F." in circle.

Product: steel ingots and castings; frogs, switches and track work, bar iron, structural shapes and light rails.

Welland Plant, Welland, Ont.: blt. 1906-7; 6 B. O. H. fur. (25 ton) idle in 1919; two 2-d. heat. fur.; 1 cont. heat. fur., 22" 3-h. 4-st.; and 12" 3-h. 5-st. merchant mills; first products rolled June, 1908. Product and annual cap.: 48,000 tons ingots, 12,000 tons steel castings; 30,000 tons billets, 28,000 tons merchant bars.

Point St. Charles Works, Point St. Charles, Montreal: blt. 1883; 2 A. O. H. fur. (15-ton) dismantled 1919; 1 Whiting converter

(2-ton) installed 1919; 3 cupolas (two for pig iron, one for spiegel). Product: manganese steel castings for sale, annual cap., 3,000 tons; gray iron castings; frogs and switches.

Longue Pointe Works, Longue Pointe, Montreal: blt. 1910-12; f. o. July, 1912; 3 B. O. H. fur. (25-ton); 2 A. O. H. fur. (30 ton). Product: steel ingots and castings for own use and for sale for cars, locomotives, and machinery; bolsters, couplers, side frames; manganese, vanadium, chrome and nickel alloy steel castings; annual cap., 25,000 tons basic open hearth, 18,000 tons acid open hearth castings.

CANADIAN WESTERN STEEL CORPORATION, Ltd., 1011 Herald Bldg., Calgary, Alberta, Canada.

Inc. May 1, 1919 in Dominion of Canada. Capital stock: com. auth. \$2,000,000, issued \$1,750,000; bonds \$178,000.

D. J. Kennedy, P.; D. E. Armstrong, Sc.; at Owen Sound. George A. MacKenzie, V. P.; W. H. Gray, A. Sc.; at Calgary.

Owns and operates plants at Redcliff and Medicine Hat, Alberta.

Redcliff Works, Redcliff, Alberta: blt. 1912-13, f. o. Oct., 1913; one 20-ton B. O. H. fur. first steel made Mar. 1, 1919; 3 single puddling fur.; 1 squeezer; three 3-d. reheat. fur.; 2 cont. heat. fur.; 18" 3-h. 1-st. muck; 14" 3-h. 1-st. and 10" 3-h. 4-st. Belgian. Fuel, nat. gas. (Formerly owned by Redcliff Rolling Mills & Bolt Co., Ltd.; acquired by Canadian Western Steel Co., Ltd., May 1, 1916; acquired by Canadian Western Steel Corporation, Ltd., July 1, 1919). Product: steel ingots, annual cap., 15,000 tons; merchant bars, annual cap., 15,000 tons.

Medicine Hat Works, Medicine Hat, Alberta: blt. 1911, f. o. Dec. 1, 1911; three 3-d. heat. fur.; 18" 3-h. 2-st. and 9" 3-h. 5-st. bar mills. Fuel, nat. gas. Bolt and nut factory. (Formerly owned by The Alberta Rolling Mills Co., Ltd.; acquired by Canadian Western Steel Corporation, Ltd., July 1, 1919). Product: merchant bars, annual cap., 12,000 tons; machine and carriage bolts and nuts, $\frac{3}{8}$ " to 1", 10,000 kegs.

Collingwood Works, Collingwood, Ontario: blt. 1901-03; 2 A. O. H. fur. (15-ton); two 3-d. heat. fur.; 18" 3-h. 4-st. and 10" 3-h. 5-st. bar mills (idle since 1908); one 4-ton 3-phase electric fur. added 1917, f. o. July, 1917 in manufacture synthetic pig iron, annual cap., about 3,500 tons low phos. pig iron; manufacture pig iron discontinued June 1, 1919. Fuel, coal. (Formerly owned by The William Kennedy & Sons, Ltd.; acquired by Canadian Western Steel Corporation, Ltd., May 1, 1919). Product: steel ingots, annual cap., 18,000 tons. (Collingwood works reported sold to M. J. Shaw, Toronto, Feb. 6, 1920.)

CANONSBURG STEEL & IRON WORKS, Canonsburg, Pa.

Inc. Sept. 2, 1902 in Pennsylvania. Capital stock: com. auth. \$250,000, issued \$210,000.

E. W. Edwards, P.; J. M. Watson, 1 V. P., G. S., G. S. M. & P. A.;
H. W. Edwards, 2 V. P.; O. S. Larkby, Sc.; G. D. Myers, T.

Works at Canonsburg: blt. 1882; 6 pair and sheet fur.; 12" 3-h. 1-st. bar; 6 black sheet mills (one 26" x 44", one 26" x 36", two 26" x 30", two 25" x 30"); 6 single stands cold rolls; 7 box annealing fur.; 1 Mesta 3-arm pickling machine. Fuel, nat. gas. Building 2 sheet and 2 pair fur.; 3 black sheet mills (one 28" x 48" roughing, 28" x 44" and 28" x 48" finishing) to be completed in Spring of 1920, annual cap., 12,000 tons.

Product: steel sheets for stamping, enameling, deep drawing, tinning, galvanizing, japanning and stove and range work, etc.; annual cap., 26,000 tons.

CANTON SHEET STEEL CO. (The), Canton, Ohio.

Inc. May 2, 1910 in Ohio. Capital stock: com. \$1,000,000; pref. 7% cum. \$1,000,000. Entire common stock owned by Hydraulic Pressed Steel Co.

J. H. Foster, P.; R. O. Mock, Sc. & C.; at Cleveland, Ohio.
C. A. Irwin, 1 V. P. & G. M.; C. W. Vilas, A. G. M.; Frank Howell, T.; U. K. Becker, A.; W. B. Parry, G. M. Works; G. T. Thomas, G. S. M.; J. E. Thomas, P. A.; at Canton.

Sales offices:

Chattanooga, Tenn., J. W. Rowan, P. O. Box 36.

Chicago, Ill., F. L. Paddock, 1602 Fisher Bldg.

Detroit, Mich., L. C. Young, 423 Book Bldg.

New York, N. Y., D. W. Healy, 149 Broadway.

Philadelphia, Pa.; W. H. S. Bateman, 822 Commercial Trust Bldg.

San Francisco, Cal., C. H. Ruder, 811 Hearst Bldg.

Works at Canton: Steel plant blt. 1917; f. o. Nov. 26, 1917; four 80-ton B. O. H. fur.; three 4-hole soaking pits; 1 billet heat. fur.; 32" 3-h. 1-st. blooming and 18" 3-h. 4-st. sheet bar mills; sheet mill blt. 1910; f. o. Jan. 2, 1911; 12 sheet and 12 pair fur.; 2 jobbing plate mills (30" 2-h.); 10 black sheet mills (28"); 7 stands of cold mills (24" x 54"); 15 box annealing fur.; 1 cont. annealing fur.; 6 galvanizing pots (50,000 tons). Fuel, coal and prod. gas.

Product: steel ingots, billets, merchant bars, sheet and tinplate bars; black sheets, galvanized, stamping, and corrugating sheets. Annual cap., steel ingots, 150,000 tons; blooms, billets and slabs, 150,000 tons; sheet and tinplate bars, 80,000 tons; sheets, 124,000 tons.

CANTON STEEL FOUNDRY CO. (The), 15th & Allen Sts. S. E., Canton, Ohio.

Inc. Jan. 1, 1912 in Ohio. Capital stock: com. auth. \$800,000, issued \$160,000; pref. 7% cum., auth. \$700,000, issued \$259,100. W. H. Morgan, P.; W. H. Ramsey, V. P. & Sc.; T. D. Russell, T.; W. W. Davidson, G. M.; J. B. Allen, A. G. M.; A. F. Morris, G. S. M.; H. S. Roose, P. A.; H. E. Derwechter, S.

Sales offices: Chicago, E. E. Silk, Peoples Gas. Bldg.; New York, H. W. Hoyer, 120 Broadway.

Works at Canton: blt. 1907; three 40-ton A. O. H. fur. Fuel, oil, nat. gas and prod. gas.

Product: steel forging ingots and steel castings for sale; nickel and chrome alloy steel ingots and castings; castings for locomotives, rolling mills, rubber machinery, blast furnaces, cranes, etc. Annual cap., 50,000 tons (ingots 20,000 tons, castings 30,000 tons).

CAPITAL CITY IRON & STEEL CO., P. O. Box 691, Harrisburg, Pa.

Inc. July 31, 1919 in Pennsylvania. Capital stock, com. \$60,000. A. Leigh Ensinger, P.; Max Williams, V. P.; John T. Wenyon, Sc.; Wolf Freedman, T.

Works at Harrisburg: construction begun Sept., 1919; two 4-d. heat. fur.; 12" 3-h. 1-st. roughing, 9" 3-h. 5-st. Belgian finishing bar mill. Fuel, oil. Will be completed about June, 1920.

Product: rerolling billets, merchant bar iron and steel, annual cap., 20,000 tons.

CARBON FURNACE CO., Parryville, Carbon County, Pa.

Inc. Sept., 1917 in Pennsylvania. Capital stock: com. \$350,000. M. S. Kemmerer, P.; J. L. Kemmerer, Sc. & T.; at Mauch Chunk, Pa. James Duane, Jr., G. M., G. S., G. S. M. & P. A.; at Parryville.

Brands: "Carbon" foundry; "Parry" bessemer; "Viking" low-phosphorus.

Carbon Furnace at Parryville: 1 stack, 65' x 15'; blt. 1869; last rebuilt 1898, relined Oct., 1918; 3 Foote stoves, 70' x 21'; 1 steam blowing eng. (14,700 cfm.); 1 water-tube boiler (150 H. P.); 6 flue boilers (1,200 H. P.). Conn. coke; New York magnetite and Lake ore. (Formerly owned by Carbon Iron & Steel Co., a limited partnership; taken over by Carbon Furnace Co., Sept., 1917.)

Product: special scotch and foundry pig iron; annual cap., 40,000 tons.

Carbon Iron and Steel Co., Ltd., Mauch Chunk, Pa., see 1916 Directory, p. 78, taken over by the Carbon Furnace Co., Sept., 1917.

CARBON STEEL CO., foot of 32nd St., Pittsburgh, Pa.

Inc. Oct. 12, 1894 in West Virginia. Capital stock: com. \$3,000,000; 1st pref. 8% non-cum. \$500,000, 2nd pref. 6% non-cum. \$1,500,000.

Charles McKnight, P.; at 901 Penn Ave., Pittsburgh. D. R. Wilson, 1 V. P. & T.; C. F. Blue, Jr., 2 V. P. & G. S. M.; W. W. Noble, Sc.; W. L. Geddis, A.; George O. Loeffler, G. S.; Peter Welker, P. A.; at foot of 32nd St., Pittsburgh.

Sales offices:

Chicago, T. A. Goodridge, Railway Exchange Bldg.

Cleveland, H. A. Noble, Williamson Bldg.

Detroit, H. S. Finkenstaedt, Penobscot Bldg.

New York, Lloyd R. Wells, Cameron Bldg.

San Francisco, G. M. Pinckard, Kohl Bldg.

Brands: "Decco," "Shrapo," "Arbo," "Cromo," "Nico,"

"Weto," "Carnova," "Carbonet," "Crovano," "Peerless,"

"Carbon Firebox" and "G. O. L. Tool."

Works at Pittsburgh: blt. 1862; rebt. 1888; 6 B. O. H. fur. (50-ton); 1 Heroult electric fur. (6-ton); eight 4-d. heat. fur.; eight 3-hole soaking pits; 36" 2-h. universal; two 16" and one 10" bar mill; 1 sheared plate mill 20" and 34" x 128"; one 32" sheet and one 32" jobbing mill; 2 hand pickling tanks. Fuel, prod. gas and oil.

Product: ingots, nickel, chrome, molybdenum and vanadium alloy steel ingots; slabs, billets; sheared plates, boiler, tank, fire box, and protective deck plates; sheets for galvanizing, stamping, etc.; hot rolled bars, bullet proof plates. Annual cap., 150,000 tons ingots, 60,000 tons billets and slabs, 70,000 tons universal and sheared plates, 20,000 tons sheets, 50,000 tons hot rolled bars.

CARBORUNDUM CO. (The), P. O. Box 536, Niagara Falls, N. Y.

Inc. Sept., 28, 1891 in Pennsylvania. Capital stock: com. \$2,500,000.

F. J. Tone, P.; George R. Rayner, V. P. & Sc.; F. H. Manley, T.;

C. H. Greenwood, Works M.; W. W. Sanderson, G. S. M.; S. S. Diemer, P. A.

Works at Niagara Falls, N. Y.: blt. and f. o. 1895; 3 fur. for the manufacture by electricity of ferro-silicon and silicon carbide.

Product: 90% ferro-silicon; annual cap., 2,000 tons.

CARNAHAN TIN PLATE & SHEET CO. (The), Canton, Ohio.

Inc. May 2, 1901 in Ohio. Capital stock: com. auth. \$400,000, issued \$399,500; pref. 7% cum. \$100,000.

J. E. Carnahan, P.; E. A. Langenbach, 1 V. P.; Roy Carnahan, Sc., T., G. M., & P. A.; J. F. Buchman, Jr., A.; W. K. Singleton, G. S. M.; at Canton. Fred H. Snyder, 2 V. P.; at Massillon, Ohio.

Sales offices:

Los Angeles, Rolph, Mills & Co., American Bank Bldg.

Montreal, Joseph R. Martin & Co., Board of Trade Bldg.

New York, William M. Smith, 3902 Woolworth Bldg.

Portland, Ore., Rolph, Mills & Co., Spaulding Bldg.

St. Louis, Walter G. Clark, 106 North 3rd St.

San Francisco, Rolph, Mills & Co., 149 California St.

Seattle, Rolph, Mills & Co., Colman Bldg.

Works at Belden Ave., N. E., and Penna. R. R., Canton: blt. 1900-1, f. o. 1902; 9 tin mills (six 27" x 29", one 24" x 32" and two 28" x 36"); 9 sheet and 9 pair fur.; 9 cold mills (3 single and 3 sets of 2 tandem); 2 Mesta pickling mach.; 8 box annealing fur. Forge blt. 1905; 12 knobbling fires; 1 hammer (5,000-lb.). The 26" 2-h. 1-st. bar mill and heat. fur. were dismantled in June, 1919.

Tin house: blt. 1901; first tinplates made Dec., 1901; 12 tinning pots for coke tinplates. Fuel, nat. gas, fuel oil and powd. coal.
 Product: charcoal blooms, black plate for tinning and tinplates, annual cap., 12,000 tons charcoal iron blooms for sale; 36,000 tons black plate, 720,000 base boxes tinplates.

CARNEGIE STEEL CO. (OF NEW JERSEY), Carnegie Bldg., Pittsburgh, Pa.

Inc. Feb. 24, 1899 amended Mar. 26, 1903 in New Jersey. Subsidiary of United States Steel Corporation.

H. D. Williams, P.; William Whigham, V. P.; W. W. Blackburn, V. P. & Sc.; W. G. Clyde, V. P. & G. S. M.; W. C. McCausland, T.; James J. Campbell, A. & A. Sc.; Charles R. Miller, Jr., P. A.

Sales offices:

Birmingham, Willard Wilson, Brown-Marx Bldg.
 Boston, Wilbur S. Locke, 120 Franklin St.
 Buffalo, Fred C. Deming, Marine National Bank Bldg.
 Chicago, Edwin S. Mills and J. G. Carruthers, 208 South La Salle St.
 Cincinnati, G. H. Vant, Union Trust Bldg.
 Cleveland, James R. Mills, Rockefeller Bldg.
 Denver, E. M. Sparhawk, First National Bank Bldg.
 Detroit, W. B. Weston, Ford Bldg.
 New Orleans, Stillman W. Wheelock, Maison Blanche.
 New York, Charles C. Cluff, 30 Church St.
 Philadelphia, James B. Bonner, Widener Bldg.
 Pittsburgh, Albert M. Harper, 227 Carnegie Bldg.
 St. Louis, W. W. Scott, Jr., Third National Bank Bldg.
 St. Paul, W. J. Totten, 1115 Pioneer Bldg.
 Washington, James B. Bonner, Wilkins Bldg.

Sales representatives: for export, United States Steel Products Co., 30 Church St., New York; for Pacific Coast business, United States Steel Products Co., at Los Angeles, Portland, San Francisco, and Seattle.

Product: pig iron, spiegeleisen, ferro-manganese, ferro-silicon; bessemer, open hearth and electric steel ingots; chrome, nickel and vanadium steels; blooms, billets, slabs, sheet and tinplate bars; forging blooms and forging billets; standard steel rails; light rails, mine rails, splice bars, steel cross ties, Braddock and Duquesne rail joints; structural shapes, beams, channels, angles, tees, zeos; steel mine timbers, steel sheet piling; universal and sheared plates, boiler, ship, tank and bridge plates; skelp; hoops, bands, cotton ties, tire steel, box and scroll steel, slack barrel hoops; merchant bars, squares, rounds, flats, hexagons, ovals, special shapes, concrete reinforcement bars; forged and heat-treated axles, connecting rods, crank shafts, arch bars; forged and rolled wheels and gear blanks, forged and rolled locomotive pistons; armor plate; bolts, rivets, etc. Iron, steel and brass castings, ingot molds and stools for own use.

Bellaire Works, Bellaire, Ohio: Blast Furnaces: 2 stacks: No. 1, 90' x 19', blt. 1873, last rebt. 1915-16; No. 2, 83'9" x 18', blt. 1894-95; remod. 1917; 8 Massicks & Crooke stoves (four 100' x 20', four 65' x 18'); 6 steam blowing eng. (92,400 cfm.); 19 water-tube boilers, 6,410 H. P., serve also sheet bar mill; 1 Uehling single-strand pig casting mach. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 276,000 tons. Steel Works: blt. 1883-1884, rebt. 1897; 2 Bessemer converters (10-ton); 3 cupolas; 250-ton mixer; five 1-hole soaking pits; 32" 2-h. 1-st. blooming, 24" 3-h. 2-st. and 24" 2-h. 1-st. Gray iron and brass foundry (1,500 tons iron, 50 tons brass castings) for own use. Product and annual cap.: 420,000 tons ingots, 364,000 tons sheet and tinplate bars.

Carrie Furnaces, Rankin, Pa.: 7 stacks.

No.	Present size.	Built.	Blown in	Rebuilt or remodeled.
1	87'6 1/4" x 21'6"	1883	Feb. 29, 1884	1919
2	87'6 1/4" x 21'6"	1888-89	July 19, 1889	1919
3	98' x 22'	1899-01	Feb. 25, 1901	—
4	98' x 22'	1899-01	Apr. 24, 1901	—
5	86'3" x 21'6"	1902-03	Apr. 10, 1903	—
6	95' x 21'6"	1906-07	June 4, 1907	—
7	95' x 21'6"	1906-07	Aug. 3, 1907	—

twenty-eight Massicks & Crooke 3-pass stoves (eighteen 90' x 21', two 90' x 22', eight 100' x 21'); 16 blowing eng. (12 steam, 4 gas) 435,000 cfm.; 60 water-tube boilers, 15,224 H. P. and 6 water-tube boilers, 7,740 H. P. under construction, all gas-fired; 4 Heyl & Patterson double-strand pig casting mach.; 2 slag granulating pits, annual cap., 88,000 tons. Conn. and Clairton by-product coke: Lake ore. Molten metal to Homestead Steel Works. Product: basic pig iron, annual cap., 1,152,100 tons.

Clairton Steel Works and Furnaces, Clairton, Pa. (leased; owned by Clairton Steel Co.):

Blast Furnaces: 3 stacks; No. 1, 82'1 1/8" x 21'6", blt. 1901-03, f. o. Apr. 21, 1903; No. 2, 82'1 1/8" x 21'8", blt. 1901-03, f. o. June 14, 1903; No. 3, 82'1 1/8" x 21'8", blt. 1901-03, f. o. Dec. 8, 1904, relined 1919; 12 Massicks & Crooke 3-pass stoves (95' x 21'); 7 steam blowing eng. (294,000 cfm.); 40 water-tube boilers, 12,000 H. P.; 1 Heyl & Patterson double-strand pig casting mach.; 3 slag granulating pits. By-product coke: Lake ore. Product: basic pig iron, annual cap., 510,000 tons.

Steel Works: blt. 1901-02; 16 B. O. H. fur. (60-ton), fuel, coal tar and coke oven gas; 1,300-ton mixer; seven 4-hole soaking pits; 10 heat. fur. (7 cont., 3 hearth); 40" 2-h. 1-st. reversing blooming; 28" 3-h. 1-st. billet; two 22" structural with 22" 3-h. 2-st., 22" 2-h. 1-st.; 18" 3-h. 3-st. and 18" 2-h. 1-st. bar; 14" structural with 14" 3-h. 2-st., 14" 2-h. 5-st. Fuel, coal, prod. gas, coal tar and coke oven gas. Product and annual cap.: 650,000 tons ingots,

foundry for own use. Product and annual cap.: 1,380,000 tons ingots (840,000 tons B. O. H., 540,000 tons bessemer; bessemer capacity can be expanded to 1,010,000 tons if demand requires); 1,510,000 tons rails, or 710,000 tons rails, 600,000 tons blooms, billets and slabs and 200,000 tons sheet bars; 85,000 tons splice bars; 180,000 tons ingot molds and stools, 13,300 tons gray iron castings and rolls, 1,600 tons brass castings, 75 tons babbit metal.

Edith Furnace, North Side, Pittsburgh (leased; owned by American Steel & Wire Co.): 1 stack, 97'8½" x 20', blt. 1898, relined 1904; 3 McClure stoves (two 100' x 22', one 85' x 21'); 5 steam blowing eng. (80,000 cfm.); 9 water-tube boilers, 2,296 H. P.; 1 Heyl & Patterson double-strand pig casting mach.; 1 slag granulating pit, annual cap., 147,800 tons. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 136,100 tons.

Farrell Steel Works and Furnaces, Farrell, Pa. (leased; owned by Union Steel Co.):

Blast Furnaces: 3 stacks; No. 1, 98' x 21', blt. 1900-01, f. o. Dec. 8, 1901, relined 1917; No. 2, 79' x 19', blt. 1902-04, f. o. Sept. 9, 1904, relined 1917; No. 3, 93' 5½" x 22', blt. 1902-04, f. o. Nov. 27, 1904, rebt. 1918-19; 12 Cowper-Kennedy stoves (eight 111' x 22', four 90' x 22'); 8 steam blowing eng. (152,237 cfm.); 45 water-tube boilers, 18,000 H. P., serve also steel works and rolling mills; 2 Heyl & Patterson double-strand pig casting mach.; Dwight & Lloyd sintering plant for flue dust, annual cap., 110,000 tons. By-product coke: Lake ore. Gray iron foundry, 2,200 tons heavy castings. Product: basic pig iron, annual cap., 440,900 tons.

Farrell By-product Coke Plant: 212 Otto Hoffman by-product coke ovens, annual cap., 480,000 net tons coke. By-product recovery plant. Carl Still benzol plant.

Steel Works: blt. 1900-01, f. o. Apr. 30, 1901; 15 B. O. H. fur. (twelve 60-ton, three 75-ton); 250-ton mixer; five 4-hole soaking pits; 6 regen. 4-d. heat. fur.; 35" 2-h. 1-st. blooming; 18" 2-h. 8-st. billet and sheet bar; 48" 2-h. universal plate mill, horizontal rolls 30" x 88". Product and annual cap.: 600,000 tons ingots; 216,000 tons blooms and billets, 120,000 tons slabs, 252,000 tons sheet and tinplate bars; 84,000 tons universal plates and skelp.

Greenville Mills, Greenville, Pa.: blt. 1871; five 5-d. heat. fur.; 8" 3-h. 3-st. and 8" 2-h. 2-st. guide; 10" 3-h. 2-st. and 10" 2-h. 2-st. guide; 10" to 8" tandem guide with 5-st. 3-h. and 2-st. 2-h. Product and annual cap.: 96,000 tons merchant bars and shapes.

Homestead Steel Works, Munhall, Pa.: blt. 1880-81; 65 B. O. H. fur. (one 15-ton, two 30-ton, one 25-ton, fifteen 35-ton, four 40-ton, twenty-eight 50-ton, ten 60-ton, four 75-ton); one cupola; 3 mixers (200-ton, 250-ton, 1,300-ton); 30 soaking pits (five 3-hole, fifteen 4-hole, ten 5-hole); 57 heat. fur. (three 3-d., thirty-nine 4-d., 1 cont., six 5-d., four 6-d., one 8-d., three 9-d.); 27 heat treating fur.; 32" 2-h. 1-st. universal slabbing; 30" 2-h. 1-st. universal

slabbing; 40" 2-h. 1-st. cogging; 28" 2-h. 1-st. blooming; 38" 2-h. 1-st. blooming; 33" 3-h. 1-st. cogging; 23" 3-h. 3-st. structural; 33" 3-h. 2-st. structural; 35" 3-h. 4-st. structural; 12" 3-h. 5-st. merchant; 16" 3-h. 3-st. merchant; 5 sheared plate mills (30" x 72" 3-h., 32½" x 84" 3-h., 36" x 110" 3-h., 35" x 128" 3-h., 38" x 140" 3-h.); 2 universal plate mills (42" 2-h. with rolls 26½" x 72", and 48" 2-h. with rolls 31" x 88"); 13 steam ham. (1,100-lb. to 6,000-lb.); 6 forging presses (750-ton to 12,000-ton). Bolt and rivet works; beam fitting shop; armor plate plant; gray iron and steel foundry. Product and annual cap.: 2,128,000 tons ingots, 2,500 tons steel castings, 2,500 tons iron castings; 1,481,000 tons blooms, billets and slabs; 448,000 tons heavy structural shapes, 338,000 tons universal plates, 891,000 tons sheared plates, 24,000 tons merchant bars, 22,500 tons armor plate, protective deck plate and heavy forgings, 16,800 kegs rivets and bolts.

Howard Axle Works, West Homestead, Pa.: blt. 1899-00; f. o. Apr., 1900; 3 cont. heat. fur.; 3 heat. treating fur.; 24" 2-h. 2-st. blooming; 12 steam ham. (7,000-lb. and 7,500-lb.). Product and annual cap.: 202,000 tons blooms and billets for axles; 165,000 tons finished car and locomotive axles.

Isabella Furnaces, Etna, Pa.: 3 stacks; No. 1, 94'3" x 21'6", blt. 1872, rebt. 1902, new shell and relined, 1919; No. 2, 90' x 20'9", blt. 1872, rebt. 1911 and relined 1919; No. 3, 94'3" x 21'6", blt. 1887, rebt. 1902, relined 1919; 12 stoves 90' x 21' (six 2-pass center-comb., six 2-pass side comb.); 10 steam blowing eng. (130,000 cfm.); 24 water-tube boilers, 6,000 H. P.; two Uehling double-strand pig casting mach.; 1 slag granulating pit, annual cap., 90,000 tons. Conn. coke: Lake ore and foreign and domestic manganese ore. Gray iron foundry (1,100 tons). Product: bessemer, special bessemer and basic pig iron; ferro-manganese, spiegeleisen and ferro-silicon; annual cap., 238,100 tons bessemer and basic pig iron, 62,400 tons ferro-alloys.

Lucy Furnaces, 51st st. and A. V. R. R., Pittsburgh, Pa.: 2 stacks; No. 1, 87'8" x 21', blt. 1872, last rebt. 1908, relined 1918; No. 2, 87'7¾" x 21', blt. 1877, last rebt. 1898, relined 1916; 9 two-pass side-comb. stoves (four 86' x 20', five 86' x 21'); 6 steam blowing eng. (80,000 cfm.); 20 water-tube boilers, 5,300 H. P.; 1 Uehling double-strand pig casting mach.; 1 slag granulating pit. Conn. coke: Lake ore and foreign and domestic manganese ore. Product and annual cap.: 46,400 tons bessemer, basic, low-phosphorus, forge and foundry pig iron; 73,700 tons spiegeleisen, ferro-manganese and ferro-silicon.

McCutcheon Mills, North Side, Pittsburgh, Pa.: blt. 1862; 7 heat. fur. (four 4-d., three cont.); 16" 3-h. 2-st. and 16" 2-h. 1-st. structural, bar and band; 10" 3-h. 2-st. and 10" 2-h. 2-st. hoop, band and light rail; two 8" 3-h. 2-st. and 8" 2-h. 3-st. hoop and band; 8" 2-h. 9-st. cont. hoop; 8" 2-h. 8-st. cont. hoop. Slack barrel hoop factory;

splice bar shop. Product and annual cap.: 48,400 tons hoops, bands, cotton ties, 57,000 tons skelp, 23,900 tons bars, 7,000 tons structural shapes, 1,500 tons light rails; 36,000 tons slack barrel hoops, 500 tons splice bars.

McDonald Mills, McDonald, Ohio: blt. 1916-18, f. o. Jan. 3, 1918; 4 cont. heat. fur.; 12" 2-h. 5-st., 10" 2-h. 3-st., 10" 3-h. 1-st. merchant bar; 10" 2-h. 6-st., 8" 2-h. 5-st. cont. merchant bar; two 10" 2-h. 6-st., 8" 2-h. 5-st. cont. hoop. Fuel, coal, pulv. coal. Product and annual cap.: 129,000 tons merchant bars, 30,000 tons hoops. Installing 2 cont. heat. fur., 18" 2-h. 11-st. band mill, annual cap., 40,400 tons to be completed about June 1, 1920; 1 cont. heat. fur., 10" 2-h. 10-st. hoop mill, annual cap., 110,000 tons, to be completed about Sept. 1, 1920.

Mingo Steel Works and Furnaces, Mingo Junction, Ohio: Blast Furnaces; 4 stacks, No. 1, 75' x 17', blt. 1872 rebt. 1900-01; No. 2, 106'7 $\frac{3}{4}$ " x 22'6", blt. 1900-01, f. o. Sept. 24, 1901; No. 3, 106'13 $\frac{1}{4}$ " x 22', blt. 1900-01, f. o. Apr. 1901, relined 1919; No. 4, 87'7 $\frac{1}{8}$ " x 22', blt. 1905-06, f. o. Jan. 20, 1906, relined 1918; 16 Massicks & Crooke stoves (four 65' x 20', four 85' x 19'6", four 85' x 21', four 100' x 21'); 7 steam blowing eng. (165,000 cfm.); 39 water-tube boilers, 13,650 H. P.; 3 Heyl & Patterson double-strand pig casting mach.; one sintering plant for flue dust, annual cap., 72,000 tons. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 585,000 tons.

Steel Works: blt. 1882, 1885-86; two 10-ton Bessemer converters; 3 cupolas; 250-ton mixer; four 4-h. soaking pits; 2 cont. heat. fur.; 36" 2-h. 1-st. reversing blooming; 32" 2-h. 1-st. reversing blooming; 24" 2-h. 1-st., 18" 2-h. 6-st. cont.; 10" cont. bar and skelp with 4-st. 3-h. and 1-st. 2-h. Fuel, coal, and prod. gas. Product and annual cap.: 600,000 tons ingots, 412,000 tons sheet bars, 65,000 tons skelp or merchant bars.

Monessen Mills, Monessen, Pa.: blt. 1898-99, f. o. Mar. 24, 1899; 2 cont. heat. fur.: 20" 3-h. 1-st. breakdown, 10" 3-h. 2-st. and 10" 2-h. 2-st. finishing; 8" 3-h. 3-st. and 8" 2-h. 2-st. hoop and band mill. Fuel, coal and tar. Product: merchant bars, hoops, bands and cotton ties; annual cap., 39,000 tons bars, 21,000 tons hoops, etc.

Neville Furnace, Neville Island, Allegheny Co., Pa. (leased; owned by American Steel & Wire Co.): 1 stack, 100' x 21'6", blt. 1900-01, f. o. July 3, 1901, relined 1910; 4 two-pass side-comb. stoves, 100' x 22'; 3 steam blowing eng. (80,000 cfm.); 14 water-tube boilers, 3,500 H. P.; one Uehling double-strand pig casting mach. Conn. coke: Lake ore and foreign and domestic manganese ore. Product and annual cap.: 163,300 tons basic pig iron.

Newcastle Steel Works and Furnaces, New Castle, Pa.: Blast Furnaces; 4 stacks, No. 1, 97'8" x 20', blt. 1872, rebt. 1897, relined 1918; No. 2, 94'6" x 21', last rebt., 1903-04, relined 1917; No. 3,

94'6" x 21', last rebt. 1903-04, relined 1917; No. 4, 106'6" x 21', blt. 1900-01, relined 1917-18; 13 Massicks & Croke stoves (eight 85' x 21', one 85' x 19'6", four 85' x 18'); 5 Cowper-Kennedy stoves (three 100' x 22', one 92' x 21', one 91'9" x 20'); about to install 3 two-pass side-comb. stoves, 110' x 22'; 10 steam blowing eng. (216,000 cfm.); 52 water-tube boilers, 13,000 H. P., serve also steel works and rolling mills; 2 Heyl & Patterson double-strand pig casting mach.; Dwight & Lloyd sintering plant for flue dust, annual cap., 98,640 tons; 4 slag granulating pits, annual cap., 352,800 tons. Conn. and Farrell by-product coke; Lake ore. Product: bessemer pig iron, annual cap., 630,000 tons.

Steel Works: blt. 1892, f. o. Nov. 2, 1892; 2 Bessemer converters (12-ton); 3 cupolas; 2 mixers (225-ton, 1,000-ton); five 4-hole soaking pits; 36" 2-h. 1-st. reversing blooming; 28" 2-h. 2-st., 26" 2-h. 2-st., 24" 2-h. 5-st. cont. sheet bar mill. Product and annual cap.: 770,000 tons ingots, 682,000 tons sheet and tinplate bars.

Niles Furnace, Niles, Ohio: 1 stack, 76'4" x 17'9", blt. 1870, last rebt. 1890; 4 Massicks & Croke stoves (one 65' x 18', three 57' x 16'6"); 3 steam blowing eng. (36,800 cfm.); 7 water-tube boilers, 2,050 H. P.; 1 slag granulating pit, annual cap., 60,000 tons. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 96,000 tons.

Ohio Steel Works and Furnaces, Youngstown, Ohio:

Blast Furnaces; 6 stacks.

No.	Present Size.	Built.	Blown in.	Relined.	No.	Stoves. Size.
1	106'6" x 23'	1899-00	Feb. 14, 1900	—	4	118' x 21'
2	106'6" x 22'	1899-00	June 7, 1900	—	4	118' x 21'
3	89' x 23'	1900-01	Mar. 29, 1901	1919	4	118'3" x 21'
4	90' x 22'	1903-04	Sept. 6, 1904	—	4	118' x 21'
5	94' x 23'	1907-09	June 29, 1909	1919	4	118' x 21'
6	95' x 23'	1907-09	Feb. 11, 1909	—	4	118' x 21'

No. 3 has Massicks & Croke stoves, the rest Cowper-Kennedy-Roberts stoves; 11 blowing eng. (7 steam, 4 twin tandem gas) 386,000 cfm.; 48 water-tube boilers, 17,493 H. P., serve also steel works and rolling mills; 3 Heyl & Patterson double-strand pig casting mach. Conn. coke: Lake ore. Slag crushing and screening plant, annual cap., 234,000 tons road ballast. Product: bessemer and basic pig iron; annual cap., 999,600 tons.

Steel Works: blt. 1893-94; 2 Bessemer converters (10-ton); 15 B. O. H. fur. (65-ton); 3 mixers (250-ton); 5 cupolas; 16 soaking pits (14 four-hole, 2 eight-hole); 43" 3-h. 1-st. blooming; 40" 2-h. 1-st. blooming; 23" 2-h. 11-st. cont. billet and sheet bar; 15" 2-h. 8-st. cont. billet. Product and annual cap.: 1,400,000 tons ingots (720,000 tons bessemer, 680,000 tons basic open hearth); 150,000 tons slabs, 632,400 tons blooms and billets, 405,600 tons sheet bars or 1,188,000 tons of blooms, billets and sheet bars.

Painter Mills, West Carson St., Pittsburgh, Pa.: blt. 1834; 7 heat. fur. (four 4-d., two 5-d., 1 cont.); 18" 3-h. 2-st. roughing, 16" 2-h. 3-st. finishing bar; 10" 3-h. 3-st., 10" 2-h. 1-st. band; 9" 3-h. 3-st., 9" 2-h. 2-st. hoop; three 8" hoop and one 8" guide mill dismantled in 1919 to allow widening of Carson St. Product: merchant bars, hoops, bands, cotton ties, lock steel, saw steel, skelp, and hinge steel; annual cap., 30,000 tons bars, 35,000 tons hoops and bands, 15,000 tons skelp.

Schoen Steel Wheel Works, McKees Rocks, Pa.: blt. 1903, f. o. Nov., 1903; 23 heat. fur. (two 4-d., twenty 5-d., 1 cont.); 3 special mills for rolling steel car wheels; 2 steam ham. (2,500-lb. and 3,300-lb.); 19 hydraulic forging presses (600-ton to 10,000-ton). Product and annual cap.: rolled and pressed steel car wheels, 132,000 tons; steel forgings, 11,720 tons.

Sharon Steel Works and Furnace, Sharon, Pa. Blast Furnace: 1 stack, 70'7" x 18', blt. 1866, rebt. 1883, relined 1919; four 2-pass side-comb. stoves (one 70' x 18', three 64' x 18'); 4 steam blowing eng. (43,789 cfm.); 6 water-tube boilers, 1,500 H. P.; 1 slag granulating pit, annual cap., 120,000 tons. By-product coke: Lake ore. Product: basic pig iron, annual cap., 95,700 tons.

Steel Works: blt. 1896-7, f. o. May, 1897; 6 B. O. H. fur. (40-ton); four 4-hole soaking pits; 2 cont. heat. fur.; 35" 2-h. 1-st. blooming, 27" 3-h. 1-st. finishing, 24" 2-h. 1-st. bull head. Fuel, powd. coal and tar in O. H., prod. gas in heat. fur. Product and annual cap.: 150,000 tons ingots, 144,000 tons sheet and tinplate bars or 120,000 tons angles, or 132,000 tons skelp.

Steubenville Furnace, Steubenville, Ohio: 1 stack, 76'2" x 17', blt. 1872, rebt. 1886, remod. 1901; 3 Massicks & Crooke stoves, 65' x 18'; 3 steam blowing eng. (27,000 cfm.); 4 water-tube boilers, 2,000 H. P.; 1 slag granulating pit, annual cap., 35,000 tons. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 69,000 tons.

Upper and Lower Union Mills, Pittsburgh, Pa.:

Upper Union Mills, 33rd St., Pittsburgh, Pa.: blt. 1863-64; 22 heat. fur. (one 2-d., three 3-d., six 4-d., 12 special); 20" 3-h. 3-st. structural; 18" 3-h. 3-st. structural; 17" 3-h. 2-st. and 17" 2-h. 1-st. structural; 12" 3-h. 3-st. structural; 8" 3-h. 3-st. and 8" 2-h. 1-st. bar; 2 universal plate mills 24" and 36". Fabricating shop. Bolt and rivet dept. makes bolts and rivets for own use. Product and annual cap.: 175,700 tons structural shapes (128,000 heavy, 47,700 light shapes); 92,000 tons universal plates, 10,800 tons fabricated work including mine ties, 200 tons bolts and rivets.

Lower Union Mills, 29th St., Pittsburgh, Pa.: blt. 1861-62; 10 heat. fur. (one 2-d., one 3-d., five 4-d., 3 special); 15" 3-h. 3-st. and 15" 2-h. 1-st. bar; 12" 3-h. 3-st. and 12" 2-h. 1-st. bar; 9" 3-h. 3-st. and 9" 2-h. 1-st. bar; sheared plate mill 16½" x 78" 3-h.; 7 steam ham. (500-lb. to 7,000-lb.). Product and annual cap.: 80,000 tons

merchant bars, 48,000 tons sheared plates; 2,000 tons forgings, shafts, crank pins, piston rods, connecting rods, ladle hooks, axles and miscellaneous forgings.

Upper and Lower Union Mills, Youngstown, Ohio:

Upper Union Mills, Youngstown, Ohio: blt. 1871; 8 gas heat. fur. (one 8-d., 7 cont.); 10" to 7" semi-cont. with 4-st. 3-h. and 8-st. 2-h.; 10" to 8" semi-cont. with 3-st. 3-h. and 8-st. 2-h.; 8" 3-h. 3-st. and 8" 2-h. 2-st. guide; 10" 3-h. 1-st. and 10" 2-h. 6-st. semi-cont.; 10" 2-h. 9-st. cont.; 12" 3-h. 3-st. and 12" 2-h. 2-st. guide; 10" 3-h. 1-st. and 10" 2-h. 7-st. cross country bar. Product and annual cap.: 104,000 tons merchant bars, 85,700 tons hoops, bands and cotton ties, 1,200 tons skelp and 74,100 tons light structural and other shapes.

Lower Union Mills, Youngstown, Ohio: blt. 1863; 6 heat. fur. (three 5-d., 3 cont.); 10" to 8" semi-cont. with 3-st. 3-h. and 6-st. 2-h.; 10" to 8" semi-cont. with 3-st. 3-h. and 7-st. 2-h.; 16" guide with 3-st. 3-h. and 1-st. 2-h.; 10" guide with 2-st. 3-h. and 2-st. 2-h.; 7" guide with 3-st. 3-h. and 2-st. 2-h. Product and annual cap.: 156,000 tons merchant bars, channels and shapes.

Zanesville Furnace, Zanesville, Ohio: 1 stack, 75' x 16', blt. 1870-71, rebt. 1883, relined 1909; 4 stoves (three 4-pass Whitwell, 65' x 17'; one 2-pass Kennedy, 70' x 18'); 4 steam blowing eng. (20,566 cfm.); 5 water-tube boilers, 1,200 H. P. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 50,000 tons.

Total annual capacity of the 59 blast furnaces, 8,765,240 tons pig iron and ferro-alloys; of the 23 steel works and rolling mills, 9,653,300 tons steel ingots, (3,250,000 tons bessemer, 6,368,300 tons basic open hearth, 35,000 tons electric); 7,449,500 tons semi-finished rolled products (4,719,900 tons blooms, billets and slabs, 2,729,600 tons sheet and tinplate bars); 5,950,420 tons finished hot rolled products, including 711,500 tons rails, 847,000 tons heavy and 225,800 tons light structural shapes, 514,000 tons universal and 939,000 tons sheared plates, 1,667,200 tons merchant bars, concrete bars and special shapes, 370,500 tons hoops, bands and cotton ties, 138,200 tons skelp, 70,000 tons splice bar shapes, 142,800 tons steel wheels and miscellaneous rolled products; 165,000 tons forged axles; 22,500 tons armor plate; 13,720 tons misc. forgings; 85,500 tons splice bars; 1,700 tons bolts and rivets; 36,000 tons slack barrel hoops.

WAREHOUSES.

The Carnegie Steel Company (of N. J.) has established warehouses where large stocks of merchant bars, structural shapes, plates, etc. (see stock lists published monthly) are carried to supply urgent demands of customers for quick delivery. These warehouses are equipped for light punching, cutting and riveting structural angles, beams and channels, etc.

The warehouses are located as follows:

Waverly Warehouses, Waverly, Newark, N. J.

New England Warehouse, Allston, Boston, Mass.

Baltimore Warehouse, Bush & Wicomico Streets, Baltimore, Md.

Cleveland Warehouse, 1394 East 39th Street, Cleveland, Ohio.

Pittsburgh Warehouse, 11th Street, Pittsburgh, Pa.

CARPENTER STEEL CO. (The), 43 Exeter St., Reading, Pa.

Inc. Nov. 1, 1904 in New Jersey. Capital stock: com. auth. \$1,200,000, issued \$1,000,000.

W. B. Kunhardt, P. & G. M.; F. A. Bigelow, I. V. P. & G. S. M.; J. H. Parker, 2 V. P.; Joseph S. Pendleton, Sc. & T.; E. J. Poole, G. S.; C. W. Gaul, P. A.

Sales offices:

Chicago, J. B. Guthrie, 1101 West Lake St.

Cleveland, C. A. Heil, 400 Lakeside Ave., N. W.

Hartford, C. W. Olsen, 410 New Park Ave.

Philadelphia, H. B. Gaylord, Bulletin Bldg.

Carpenter Steel Works, Reading, Pa.: blt. 1889-90; rebld. after fire 1892; 2 crucible fur. (42-pot); 3 B. O. H. fur. (15-ton); 4 Heroult electric fur. (6-ton); first O. H. steel made April 20, 1914; 21 heat. fur. (three 1-d., five 2-d., two 3-d., three 4-d., 7 cont. and 1 tube fur.); 20" 3-h. 2-st. cogging and finishing; 16" 3-h. 6-st. cogging and finishing; Belgian mill with 18" 3-h. 2-st., 10" 3-h. 5-st. and 10" 3-h. 4-st. finishing; 12" 3-h. 3-st., 10" 3-h. 6-st.; 9" 3-h. 6-st. finishing; 21" 2-h. 1-st. tube mill; four 10", sixteen 8" and six 6" cold strip mills; 16 box annealing fur.; 17 open annealing fur.; 14 hand pickling tanks; 20 wire drawing blocks and 2 drawing benches for wire $\frac{9}{16}$ " to .013 gage and bars $\frac{3}{4}$ " to $2\frac{1}{2}$ "; 8 steam ham. (700-lb. to 7-ton).

Product: steel for tools, dies, cutlery, files, wire, etc., nickel, chrome, tungsten and vanadium alloy steel; annual cap., steel ingots, 36,500 tons (open hearth 16,000 tons, electric 17,000 tons and crucible 3,500 tons), rolled products, 21,660 tons; plain wire, 6,000 tons; forged products, 5,000 tons.

Carr (W. R.) & Co., Spartanburg, S. C., see 1916 Directory, p. 91. Company out of business. Charcoal blast furnace, annual cap., 3,000 tons, at Phelps, Wis., idle and for sale.

Carter Iron Co., Pittsburgh, Pa., see 1916 Directory, p. 91, Robert A. Carter and Thomas B. Foley, receivers. Paden City Works were acquired by Vulcan Iron & Steel Co., a West Virginia corporation, August 22, 1917. The name of this company was changed in 1919 to Monongahela Iron & Steel Co. The Ivanhoe Furnace, controlled by stock ownership, seems to have reverted to the Ivanhoe Furnace Co. and was subsequently acquired by Ivanhoe Furnace Corporation. The Hays Station Works were owned and operated by the Monongahela Iron & Steel Co., a Pennsylvania corporation, dis-

tinct from company of same name mentioned above; and were sold in 1919 to J. P. & W. B. Eichleay, Pittsburgh.

Cayuga Tool Steel Co., Ltd., Auburn, N. Y. Organized in January, 1917. Rolling mill began operation October 1, 1917. The company was in the hands of a receiver January, 1918, and the works were offered for sale at public auction September 5, 1918. Sold to the Crucible Steel Co. of America, who took possession October 12, 1918.

CEDARTOWN IRON CO., Anniston, Ala.

Inc. Nov. 28, 1910. Capital stock: \$30,000.

G. B. McCormack, P.; E. Ramsey, Sc.; at Birmingham, Ala.

J. B. Carrington, T. & G. M.; T. D. Donoho, P. A.; at Anniston.

Cherokee Furnace at Cedartown, Ga.: 1 stack, blt. 1874-5, last rebt. 1903; 60' x 14'; iron-pipe stoves. Charcoal: local brown hematite ore. 2 charcoal ovens. Last active in 1910.

Company owns iron ore mines: Cherokee Mine at Cedartown, Ga.

Product: charcoal pig iron, annual cap., 20,000 tons.

Central Alabama Coal & Iron Co., see Jenifer Iron & Coal Co.

CENTRAL IRON & COAL CO., 90 West St., New York, N. Y.

Inc. Mar. 2, 1901 in New Jersey. Capital stock: com. \$1,000,000; bonds \$1,189,000.

George A. Harder, P.; E. McElheaney, Sc.; at New York. W. W.

Taylor, 1 V. P. & G. M.; C. E. Morris, A.; W. M. Joyner, P. A.;

at Holt, Ala.

Selling agents: Crocker Bros., 21 East 40th St., New York City.

Brand: "Tuscaloosa."

Tuscaloosa Furnace at Holt, near Tuscaloosa, Ala.: 1 stack, 85' x 19' 2"; blt. 1901-3; f. o. Aug., 1903; rebt. 1911-12; relined July, 1919; 4 Foote stoves, 85' x 19'; 4 steam blowing eng. (77,000 cfm.); 11 water-tube boilers (3,000 H. P.); nodulizing plant for pyrites cinder (two 8' x 100' rotary kilns), annual cap., 72,000 tons. By-product coke; local brown and red ore from own mines and purchased. Company owns and operates brown ore mines at Friedman, and red ore mines at Valley View, Ala.; coal mine at Kellerman, Ala. Connected with the furnace are 160 beehive coke ovens (abandoned since 1909) and 60 Semet-Solvay by-product coke ovens; annual cap., 180,000 net tons.

Product: foundry pig iron; annual cap., 85,000 tons.

CENTRAL IRON & STEEL CO., Harrisburg, Pa.

Inc. April 19, 1897. Capital stock: com. auth. \$5,000,000, issued \$2,245,400; bonds \$412,000.

R. H. Irons, P.; F. J. Hall, V. P.; L. D. Perry, Sc. & T.; W. H.

Drinkwater, P. A.

Sales offices:

Baltimore, Continental Trust Bldg.

Boston, Mass., 131 State Street.

New York, 66 Broadway.

Philadelphia, Stock Exchange Bldg.

San Francisco, 22 Battery St., C. W. Pike Co.

Los Angeles, Washington Bldg., C. W. Pike Co.

Seattle, L. C. Smith Bldg., Hilton-Pike-Oakley Co.

Montreal, 232 St. James St., James W. Pyke & Co., Ltd.

Product: pig iron, sheared and universal plates and sheets, boiler plates, marine and locomotive steel, ship plates, tank plates, bridge and structural plates, flanged and dished heads. Total annual cap., 160,000 tons plates.

The company owns and operates the following blast furnaces, steel works and rolling mills, located at Harrisburg, Pa.

Paxton Furnaces: 2 stacks; No. 1, blt. 1855, rebt. 1886, 75' x 14'; No. 2, blt. 1872, remodeled 1906 and 1917, 80' x 18'; 6 Whitwell stoves (four 60' x 18', two 50' x 18'); 3 steam blowing eng. (45,000 cfm.); 2 slag granulating pits, annual cap., 120,000 tons. Coke; various ores. Molten metal to open hearth furnaces. Product: basic, foundry, forge, bessemer and malleable pig iron; annual cap., 85,000 tons.

Open Hearth Steel Works: blt. 1903-04, enl. 1917-18, first steel made June 9, 1904; 6 B. O. H. fur. (two 60-ton, four 110-ton); annual cap., 200,000 tons ingots.

Paxton Rolling Mills: orig. blt. 1869; six 3-d. heat. fur. (3 coal, 3 gas); 3-h. sheared plate mill, 34" x 126". Fuel, coal and prod. gas. Flanging shop. Gray iron foundry and machine shop for own use. Product: sheared plates, annual cap., 59,000 tons.

Central Iron Works: orig. blt. 1853; soaking pit; 42" universal mill with four 3-d. gas heat. fur.; sheared plate mill, 3-h. single-stand, 28" x 89", with one 5-d., one 3-d. and one 2-d. coal heat. furnaces; sheared plate mill with 2-h. roughing and 3-h. Lauth finishing stands, each 26" x 72", with two 3-d. coal heat. fur. Fuel, coal and prod. gas. Product: universal (59,000 tons) and sheared plates (42,000 tons).

Coal and coke properties: The Central Iron and Steel Co. controls the Connellsville Basin Coke Co., which owns 2,400 acres of coal and 200 beehive coke ovens at Richard, Monongalia Co., W. Va.; annual cap., 200,000 tons of coal and 120,000 net tons of coke.

CENTRAL OF GEORGIA RAILWAY CO., Savannah, Ga.

W. H. Fetner, S. of Motive Power.

One 3-h. Ajax reclaiming train added to the company's shops at Macon, Ga., 1910; first products rolled, June 10, 1910. Fuel, oil.

Product: rounds from $\frac{3}{4}$ " to 2", rolled from scrap, for own use; annual cap., 350 tons.

Central Steel Co., Ottawa, Ill., see 1916 Directory, p. 94, rolling mill abandoned and partly dismantled in 1918.

CENTRAL STEEL CO. (The), Massillon, Ohio.

Controlling interest held by the Massillon Rolling Mill Co.

R. E. Bebb, P.; F. J. Griffiths, V. P. & G. S.; Charles E. Stuart, Sc. & T.

Works at Columbia Heights, near Massillon: blt. 1914-15; first steel made June 8, 1915; first products rolled June 10, 1915; 10 B. O. H. fur. (seven 50-ton, two 75-ton, one 15-ton); five 4-hole soaking pits; 34" reversing blooming mill; 28" 3-h. 2-st. bar mill with bull-head finishing pass. Fuel, nat. and prod. gas and oil. Power, electricity purchased from power company.

Product: ingots, blooms, sheet bars, alloy sheet bars, etc.; annual cap.; 350,000 tons ingots; 290,000 tons blooms, billets, forging billets, and sheet bars.

CENTURY STEEL CO. OF AMERICA, Poughkeepsie, N. Y.

Inc. June 4, 1915 in New York. Capital stock: com. \$1,500,000.

F. B. Lown, P.; E. E. Perkins, 1 V. P.; Charles B. Laister, 2 V. P. & G. M.; Deyo S. Freer, A. Sc. & A. T.; William S. Rennie, S.; F. A. Lown, S. M.; Joseph Meyer, P. A.; at Poughkeepsie. E. E. Smith, Sc. & T.; at 52 Devonshire St., Boston, Mass.

Selling agencies:

Atlanta, Ga., C. J. Kinsey, 34 So. Forsyth St.

Boston, Mass., C. A. Bliven, 171 High Street.

Buffalo, N. Y., Aborn Steel Co., 521 Marine Bldg.

Cleveland, Ohio, G. H. Marvin, 232 St. Clair Ave.

Chicago, Ill., General Steel Co., Washington Blvd. & Green St.

Detroit, Mich., Geo. H. Marvin 60 Cadillac Sq.

New York City, Aborn Steel Co., 22 Clark Street.

Oakland, Cal., Thomas Mannifield.

Philadelphia, Pa., Aborn Steel Co., 269 Drexel Bldg.

Rochester, N. Y., Aborn Steel Co., 133 Andrews St.

St. Louis, Mo., Thomas H. Tamplin, 112 North 3rd St.

Springfield, Mass., Chas. C. Lewis Co., 32 Lyman St.

Works at Poughkeepsie: blt. 1917, f. o. Oct., 1917; one 32-pot crucible fur.; 7 hammers (150-lb. to 3500-lb.). Fuel, prod. gas.

Product: crucible steel ingots; tool steel bars, high speed steel; tungsten, chrome, vanadium and other alloy steels. Annual cap., 2,400 tons ingots, 2,000 tons forged products.

Chambersburg Engineering Co., Chambersburg, Pa., see 1916 Directory, p. 94, open hearth furnace equipment was sold and furnaces dismantled in 1916.

CHAMPION HORSE SHOE CO., Pawtucket, R. I.

Inc. 1912. Capital stock: com. \$100,000; pref. \$200,000.

George W. Allen, P.; George L. Bowen, V. P. & G. M.; F. V. Hallam, Sc.; H. P. Chase, T.

Brand: "Champion."

Works at Pawtucket: blt. 1905; enl. 1912; first products rolled Aug. 7, 1912; two 3-d. scrap, two 3-d. billet heat. fur.; 9" 3-h. 3-st. guide; 16" 3-h. 1-st. guide; 2 forge fires, 6 bending machines, 8 punching machines, 3 grubbing machines, 6 planishing machines. Fuel, oil and coal.

Product: bars for own use, horse and mule shoes; annual cap., 6,000 tons of bars and 120,000 kegs (100-lb.) of horseshoes.

CHARCOAL IRON CO. OF AMERICA, Detroit, Mich.

Inc. May 13, 1915 in Michigan. Capital stock: com. \$2,839,350; pref. 6% cum. \$5,217,250.

Frank W. Blair, P.; Edwin Lodge, V. P.; H. H. Bingham, V. P., Sc. & C.; F. W. Hutchings, V. P., T. & G. S. M.; R. F. Birchard, P. A.; at Detroit. John W. Mitchell, V. P.; at Toronto, Ont., Canada.

Selling agents: Rogers, Brown & Co.

Brands: "Hinkle," "Pine Lake," "Champion," "Michigan."

Product: charcoal foundry, car-wheel and malleable pig iron.

BLAST FURNACES.

Ashland Plant, Ashland, Wis.: 1 stack, 60' x 12', blt. 1887-88, f. o. March, 1888, remod. 1897; closed top; 2 Whitwell stoves; hot blast. Charcoal; Lake ore. Charcoal kilns; wood alcohol and acetate of lime plant. Machine shop. Product: foundry, car-wheel, and malleable pig iron, annual cap., 45,000 tons.

Boyne City Plant, Boyne City, Mich.: 1 stack, 60' x 10½', blt. 1903-04, f. o. Jan. 1, 1905; 2 Kloman fire-brick stoves, 60' x 15' 6". Charcoal; Lake ore. Product: car-wheel and malleable pig iron, annual cap., 29,000 tons.

Chocolay Plant, Chocolay Mich.: dismantled in 1917.

Elk Rapids Plant, Elk Rapids, Michigan: dismantled in 1918.

Manistique Plant, Manistique, Mich.: 1 stack, 58' x 12', blt. 1890-91, f. o. Mar. 4, 1891; 3 iron stoves; warm blast (800° or 850°). Charcoal; Lake ore. Charcoal kilns; wood alcohol and acetate of lime plant. Product: car-wheel and malleable pig iron, annual cap., 36,000 tons.

Newberry Plant, Newberry, Mich.: 1 stack, 51½' x 10½', blt. 1882-83, f. o. May, 1883; last rebt. 1903; closed top; four iron stoves; warm blast; water jackets. Charcoal; Lake ore. Charcoal retorts; wood alcohol and acetate of lime plant. Product: car-wheel and malleable pig iron, annual cap., 29,000 tons.

Charcoal Iron Co. of America owns a large acreage of timber lands in Michigan and Wisconsin. It operates the Yale mine in the Gogebic Range, Gogebic County, Mich., annual cap., about 500,000 tons of iron ore.

Charleston Alloy Steel Co., see Charleston Steel Co.

Charleston Steel Co., Charleston, W. Va., was incorporated in 1916 and built a plant at Belle, W. Va., consisting of two 3-ton electric furnaces and a $2\frac{1}{2}$ -ton steam hammer; product, steel ingots and hammered bars. The plant was operated for several months in 1917. Name was changed in 1917 to Charleston Alloy Steel Co. Plant was dismantled in 1918.

CHATTANOOGA ELECTRO METALS CO., 2108 Chestnut St., Chattanooga, Tenn.

Inc. 1918 in Tennessee. Capital stock: com. \$120,000.

Paul J. Kruesi, P. & T.; N. Thayer Montague, V. P. & Sc.; George L. Davison, G. M.

Selling agents: Rogers, Brown & Co. at New York, Chicago, Cincinnati, etc.; Shawinigan Products Corporation, 165 Fifth Ave., New York, and 549 McCormick Bldg., Chicago.

Works at Chattanooga: blt. 1918; f. o. 1918; 1 Fitzgerald 3-phase, open-top electric furnace. Electric power from Chattanooga Railway & Light Co.

Product: ferro-silicon in all grades from silvery pig iron to 90% ferro-silicon; annual cap., 7,000 tons.

CHATTANOOGA IRON AND COAL CORP., 312 Temple Court, Chattanooga, Tenn.

Inc. Jan. 1913 in Tennessee. Capital stock: com. \$1,500,000; pref. \$1,000,000. Subsidiary of the Iron Products Corp., 90 West St., New York.

George A. Harder, P.; W. W. Taylor, V. P. & G. M.; Stephen Barker, Sc. & T.

Brand: "Signal."

Chattanooga Furnace, Chattanooga: 1 stack, 75' x 16'; blt. 1905-06; f. o. April 25, 1906; relined 1919-20; four 4-pass Whitwell stoves, 60' x 18'; 4 steam blowing eng. (30,000 cfm.); 10 water-tube boilers (2,900 H. P.). Coke: red and brown ore from Georgia and Alabama. The company owns red ore mines at Estelle, Georgia, annual cap., 120,000 tons. Also owns 14,000 acres coal lands and 268 beehive coke ovens at Dunlap, Tenn.; annual cap., 125,000 net tons coke.

Product: foundry pig iron; annual cap., 60,000 tons.

CHESTER STEEL CASTINGS CO., 407 Sansom St., Philadelphia, Pa.

Inc. June 30, 1871 in Pennsylvania. Capital stock: com. \$10,000.

E. W. Dwight, P. & T.; J. D. Wetzler, Sc. & P. A.; at 407 Sansom St., Philadelphia. William T. Dunning, V. P. & G. M.; H. M. Bonawitz, A. Sc.; at Chester, Pa.

Works at Chester, Pa.: blt. 1871; 2 A. O. H. fur. (30-ton); 8 McHaffie cementation fur.; 3 gas prod. Fuel, oil and coal.

Product: steel castings for sale; gray iron castings; annual cap., steel castings, 10,800 tons (10,000 tons open hearth, 800 tons cementation).

CHICAGO ELECTRIC STEEL CO., 447 Kensington Ave., Chicago, Ill.
Inc. April 9, 1918 in Delaware. Capital stock: com. auth. 7,500 shares no par value, issued 5,000 shares; pref. 7% cum. auth. \$750,000, issued \$250,000.

P. W. Chapman, P.; Norman L. MacLeod, V. P.; J. G. Brown, Sc. & T.

Works at 447 Kensington Ave., Chicago: 2 electric fur. (1 Booth-Hall, 3-ton; 1 Rennerfelt, 1-ton); f. o. Aug., 1918; two 1-d. heat. fur.; 10" 3-h. 5-st. mill; 2 box annealing fur.; 2 steam ham. (700-lb., 4,000-lb.). Fuel, oil. First rolled products, Apr. 26, 1919; first forged products, Mar., 1919.

Product: steel ingots; carbon, alloy and high speed tool steel; rounds, squares and flats; annual cap., 5,000 tons steel ingots, 8,000 tons rolled products; 1,000 tons hammered products.

CHICAGO STEEL FOUNDRY CO., 3720 South Kedzie Ave., Chicago, Ill.

Inc. Oct. 16, 1906 in Maine. Capital stock: com. auth. \$150,000, issued \$125,500.

David Evans, P. & T.; C. M. Lauritzen, V. P.; F. H. Blankenhorn, Sc.; A. Dapogny, G. S.

Selling agents: David Evans & Co., 332 South Michigan Ave., Chicago.

Works at 3720 So. Kedzie Ave., Chicago: blt. 1912; f. o. Aug. 13, 1912; one 6-pot crucible fur. (idle); 2 Tropenas converters (1-ton and 2-ton); 2 cupolas. Fuel, oil.

Product: steel castings for sale; manganese and other alloy steel castings; special low carbon steel castings for electrical machinery; annual cap., 5,000 tons converter castings. Wire rope sockets.

CHROME STEEL WORKS, Chrome, N. J.

Ferdinand E. Canda, P.; at 11 Pine St., New York. F. M. Canda, Abeel Canda, Wm. Corry, V. P.; A. Kloh, Sc.; A. A. O'Neill, T.; at Chrome, N. J.

Works at Chrome: blt. 1902-4; f. o. Mar. 19, 1904; 5 A. O. H. fur. (two 20-ton, three 25-ton); two 24-pot crucible fur.; 12 coal and gas heat. fur.; 3 annealing fur.; 10 oil fur.; 1 Schwartz electric fur. used for melting alloys for O. H. fur.; one 4,000-ton hydraulic forging press; one 1,200-ton hydraulic high speed forging press; 15 steam hammers; 2 tire rolling mills; 34" x 112" 3-h. plate, 24" x 72" 2-h. plate, 24" x 36" 2-h. agricultural implement, 21" x 54" 3-h. for rounds, 18" x 52" 3-h. for angles, flats and special shapes, 12" x 38" 3-h. for angles, flats and special shapes. Fuel, coal, oil and prod. gas. Machine shop.

Product: "Adamantine" chrome-steel burglar-proof plates, angles, and bars for safes, vaults and jails; agricultural implement shapes; stamp mill shoes, dies, rolled shells and rings; balls for cement and ore grinding; "Adamantine" chrome steel castings of every description. Annual capacity; 50,000 tons open-hearth steel (35,000

tons ingots, 15,000 tons castings); 4,000 tons crucible steel (2,500 tons ingots, 1,500 tons castings); 40,000 tons rolled and 15,000 tons forged products.

CINCINNATI HORSE SHOE AND IRON CO. (The), Cleves, Ohio.
Telegraph address, Cincinnati, Ohio.

Inc. 1907 in Ohio. Capital stock: com. \$200,000.

T. F. Hotchkiss, P.; at Joliet, Ill. A. J. Barron, V. P. & G. M.; Leo E. Steele, Sec. & T.; R. H. Miller, G. S.; at Cleves.

Works at Cleves: blt. 1906; f. o. Sept. 26, 1906; 10 heat. fur. (2 scrap, 2 billet and 6 horseshoe, all 4-d.); 16" 3-h. 1-st. scrap bar, two 9" 3-h. 5-st. bar; and horseshoe machines. Fuel, coal.

Product: iron and steel horseshoe bars; horse and mule shoes; annual cap., s. t., 9,600 tons of bars and 180,000 kegs of shoes.

CINCINNATI STEEL CASTINGS CO. (The), Queen City & Spring Grove Aves., Cincinnati, Ohio.

Inc. Jan. 4, 1909 in Ohio. Capital stock: com. \$100,000.

William Gilbert, P.; J. D. Leary, V. P.; Fred W. Lammers, Sec., T. & G. M.; C. P. Zahneis, A. & P. A.; Leonard Geiser, G. S.

Works at Cincinnati: blt. 1909; first crucible steel made Apr. 26, 1909; first converter steel made Jan. 11, 1912; 1 Whiting converter (1½-ton); 1 cupola. Fuel, gas and oil. Crucible fur. dismantled in 1916. Installing one 2-ton Booth electric fur.; annual cap., 2,400 tons steel castings; to be completed in July, 1920.

Product: steel castings of all descriptions; also alloy castings. Annual cap., 2,000 tons converter steel castings.

CLAIRE FURNACE CO., 514 Frick Bldg., Pittsburgh, Pa.

Inc. 1901 in Pennsylvania. Capital stock: com. \$650,000.

E. W. Mudge, P.; C. B. Ferree, V. P., T. & G. S. M.; R. G. Campbell, Sec.; E. W. Pogue, A.; O. G. Lechlitter, G. M.; J. L. Anderson, P. A.; at Pittsburgh. W. S. Sprow, S.; at Sharpsville. Brand: "Claire."

Claire Furnace at Sharpsville, Pa.: 1 stack, 75' x 16'; blt. 1869, last rebt. 1906, relined 1917; 4 McClure fire-brick stoves; 3 steam blowing eng. (40,000 cfm.); 7 boilers (4 water-tube and 3 flue) 1,600 H. P.; 1 Heyl & Patterson single-strand pig casting machine. Conn. coke; Lake ore. Building stack, 87' x 19'6", construction begun April 1, to be completed Dec. 1, 1920, annual cap., 145,000 tons, to replace old stack.

Product: bessemer and basic pig iron; annual cap., 85,000 tons.

CLARK BROTHERS CO., Olean, N. Y.

Inc. Jan. 26, 1903 in New York. Capital stock: com. auth. \$500,000, issued \$328,000; pref. 7% cum auth. \$100,000, issued \$99,000.

W. A. Dusenbury, P.; J. S. Reid, Sec. & T.; F. H. Light, A. & P. A.; G. F. Swartz, G. S. M.; at Olean.

Works at Olean: one 3-ton Fisher converter (idle for several years)

added to gray iron foundry, 1907; first steel made Oct., 1907; 2 cupolas. Fuel, oil. Machine shop for own use.

Product: steel castings for own use in manufacture of saw mill machinery and engines, annual cap., 1,500 tons.; gray iron castings, annual cap., 7,500 tons.

CLARK EQUIPMENT CO., Buchanan, Mich.

Inc. Dec. 28, 1916 in Michigan. Capital stock: com. auth. \$3,000,000, issued \$2,337,600; pref. 7% cum. auth. \$2,000,000, issued \$1,214,900.

Eugene B. Clarke, P.; at 1415 Railway Exchange Bldg., Chicago. M. L. Hanlin, V. P.; R. J. Burrows, V. P.; E. B. Ross, V. P.; N. M. Carleton, Sec., T. & A.; Frank Habicht, P. A.; at Buchanan.

The company, formed by merger of Buchanan Electric Steel Co. and the Celfor Tool Co. effective Jan. 1, 1917, has three plants at Buchanan: drill plant and axle plant (formerly owned by the Celfor Tool Co.); and a steel casting plant now known as Wheel Dept. (formerly owned by the Buchanan Electric Steel Co.).

Wheel Dept., Buchanan: blt. 1911-12; f. o. Feb., 1912; 2 Heroult electric fur. (2-ton and 4½-ton). Fuel, electricity. Wheel shop for finishing steel wheels, annual cap., 24,000 wheels.

Product: steel wheels and steel castings for motor trucks; annual cap., 5,000 tons; Celfor high speed drills; and motor truck axles, annual cap., 20,000 rear axles.

Clark Steel Hoop Co., Punxsutawney, Pa., see 1916 Directory p. 99, was acquired by the Punxsutawney Iron and Steel Co., Mar. 20, 1916 and sold by them to the Danville Iron and Steel Co., April 27, 1917.

CLEVELAND-CLIFFS IRON CO. (The), Rockefeller Bldg., Cleveland, Ohio.

Inc. May 9, 1891 in West Virginia. Capital stock: com. auth. \$10,000,000, issued \$9,957,400; bonds \$1,050,000.

William G. Mather, P.; S. L. Mather, Sc.; Charles G. Heer, T.; C. D. Mason, A.; at Cleveland. M. M. Duncan, V. P.; A. J. Yungbluth, P. A.; at Ishpeming.

Brands: "Pioneer" and "Marquette" for charcoal pig iron.

Sales offices: Cleveland, Ohio, Rockefeller Bldg.; Grand Rapids, Mich., Superior Charcoal Iron Co. (agents for charcoal pig iron sales).

The Cleveland-Cliffs Iron Co., primarily an iron mining company, also owns the two charcoal furnaces described below and in connection with each plant a charcoal plant with recovery of by-products.

Gladstone Furnace, Gladstone, Mich.: 1 stack, 60' x 12'; blt. 1895-96; f. o. April 16, 1896; relined 1919; 2 Cowper-Roberts hot-blast stoves, 60' x 17'; 1 steam blowing eng. (12,000 cfm.); 9 water-tube boilers (1,125 H. P.). Charcoal: Lake ore. Product: Scotch, foundry and chilling pig iron; annual cap., 38,000 tons.

Marquette Furnace, Marquette, Mich.: 1 stack, 70' x 12'; blt. 1901-03; f. o. April 16, 1903; relined 1919; 3 Cowper-Roberts stoves, 70' x 17'; 1 steam blowing eng. (12,000 cfm.); 12 water-tube boilers (3,000 H. P.). Charcoal: Lake ore. (Formerly owned by the Pioneer Iron Co.; acquired by The Cleveland-Cliffs Iron Co., Dec. 31, 1916). Product: Scotch, foundry and chilling pig iron; annual cap., 42,000 tons.

At Gladstone the company operates 70 kilns and 12 retorts for the manufacture of charcoal with an annual cap. of 3,572,000 bushels. At Marquette the company operates 20 retorts for making charcoal with an annual cap. of 3,966,000 bushels. By-product recovery plants are operated at both Marquette and Gladstone.

IRON ORE PROPERTIES.

The company owns the Angeline, Cliffs Shaft, Holmes, Lake and Salisbury iron ore mines at Ishpeming, Mich.; the Princeton mine at Gwinn, Mich.; the Republic mine at Republic, Mich., and the Maas and South Jackson Mines at Negaunee, Mich. The company also leases the Austin, Francis, Gardner-Mackinaw, Gwinn and Stephenson mines at Gwinn, Mich.; the Spies mine at Iron River, Mich.; the Morris-Lloyd mine at Ishpeming; the Crosby mine at Nashwauk, Minn.; and the Meadow mine at Aurora, Minn. The company controls or operates the Athens and Negaunee mines at Negaunee, Mich.; the Webster mine at Michigamme, Mich. (idle); the Helmer-Wade mine at Kinney, Minn.; and the Hill-Trumbull mine at Marble, Minn. These mines have an annual capacity of approximately 3,500,000 tons of iron ore.

Cleveland Furnace Co., Cleveland, Ohio, see 1916 Directory, p. 100; acquired by The Otis Steel Co., Oct. 1, 1919.

CLEVELAND HARDWARE CO. (The), 4518 Lakeside Ave., Cleveland, Ohio.

Inc. 1881 in Ohio. Capital stock: com. auth. \$5,000,000, issued \$2,607,700.

Charles E. Adams, P.; Thomas P. Robbins, 1 V. P. & T.; William F. Gibbons, 2 V. P., Sc. & G. S. M.; Edgar E. Adams, 3 V. P. & G. S.; William R. Lorenz, A.; William D. Lewis, P. A.

No. 1 plant at 4518 Lakeside Ave.: blt. 1879; rebt. 1891; 3 heat. fur. with 2 Duff gas prod. (one 3-d., one 4-d., regenerative); 10" 3-h. 7-st. guide mill. The company operates 2 forging plants, 1 at No. 1 plant and 1 at No. 2 Plant, 3270 E. 79th St., blt. 1906. Fuel, bituminous coal, producer and natural gas. Machine shop and nut dept. Crucible steel foundry added in 1917, f. o. Nov., 1917; annual cap., 40 tons crucible steel castings for own use only.

Product: rolled shapes for the manufacture of steel forgings for vehicles; annual cap., 12,000 tons of rolled material, 40,000 tons of forgings.

CLEVELAND STEEL CASTING CO., East 69th & Hubbard Sts., Cleveland, Ohio.

Partnership; George W. and Stephen Balkwill, Owners.

Works at East 69th & Hubbard Sts., Cleveland: blt. 1893; f. o. Jan. 9, 1895; 2 A. O. H. fur. (20-ton). Fuel, nat. gas.

Product: steel ingots and steel castings; street car motor gears, machined molded gears up to 18' dia.; annual cap., 14,000 tons ingots, 8,000 tons steel castings.

CLEVELAND STEEL CO. (The), 803 Rockefeller Bldg., Cleveland, Ohio.

Inc. Dec. 8, 1893 in Ohio. Capital stock: com. auth. \$500,000, issued \$337,300.

James C. Jones, P.; W. S. Bowler, V. P.; P. W. Throssell, Sc.; C. E. Terrill, T.; C. H. Kaufman, S.

Selling agents:

Chicago, J. V. Cowling & Co., 208 La Salle St.

Detroit, F. Walter Guibert, Ford Bldg.

Kansas City, Mo., George T. Cook, Finance Bldg.

Los Angeles, C. F. Lape, Stimson Bldg.

St. Louis, Beckwith Bros., Chemical Bldg.

St. Paul, Rank & Goodell, Merchants Bank Bldg.

Works at foot of East 38th St., Cleveland: orig. built 1853; 4 cont. gas. heat. fur.; sheared plate mill with 25" x 72" 3-h. roughing and 30" x 72" 3-h. finishing stands. Fuel, nat. gas, prod. gas and coal.

Product: No. 12 and heavier plates up to 64" wide and 300" long; annual cap., 60,000 tons. Tank plates, stamping sheets, special analysis plates and sheets.

CLINTON IRON AND STEEL CO., (P. O. Box 287), Pittsburgh, Pa.

Inc. July 9, 1889 in Pennsylvania. Capital stock: com. \$300,000.

F. N. Hoffstot, P.; at 24 Broad St., New York, N. Y. C. W.

Friend, V. P. & P. A.; T. W. Friend, Sc., T. & G. S. M.; E. J.

Pearson, G. S.; at Pittsburgh.

Sales office: 350 Broadway, New York, E. C. Sanier, S. A.

Brands: "Clinton," "Hector."

Clinton Furnace, Pittsburgh: 1 stack, 76' x 18'; blt. 1851, last rebt.

1914; 4 Foote hot-blast stoves (three 60' x 18', one 80' x 20'); 3 steam blowing eng. (50,000 cfm.); 7 water-tube boilers (3,000

H. P.); 1 Heyl and Patterson single-strand pig casting machine;

one slag granulating pit (80,000 tons). Conn. coke; Lake ore.

Product: basic, malleable, car-wheel and foundry pig iron; annual

cap., 110,000 tons.

CLINTON-WRIGHT WIRE CO., 69 Hammond St., Worcester, Mass.

Inc. 1919 in Massachusetts. Capital stock: com. \$7,500,000;

1st. pref. 7% cum. \$3,500,000; 2nd pref. 8% cum. \$5,000,000.

Harry W. Goddard, Ch.; George M. Thompson, P. & G. M.;

John A. Denholm, V. P. & G. S. M.; George F. Wright, V. P.;

J. Lothrop Motley, Sc.; Frank Kilmer, T.; John Wheeldon, G. S.;
A. C. Lorion, P. A.

Sales offices:

Chicago, J. J. Collins, 31-35 West Austin Ave.

New York, Equitable Bldg.

Philadelphia, L. Jackson, 410-412 Commerce St.

San Francisco, A. B. Stephens, 111-113 Townsend St.

Tulsa, Okla., E. R. Neptune, Mayo Bldg. (wire rope only).

Company operates wire mills as follows:

Webster St., Worcester, Mass.: card wire, music wire, formed wire, misc. round and flat wire, cold-rolled strip steel, wire specialties, Onlee headlight controllers.

Hammond St., Worcester: poultry netting, poultry fence, riddles and sifting screens, misc. wire cloth, wire and iron fencing, ornamental iron work, misc. wire specialties.

Union St., Worcester: bright wire goods, kitchen wire goods, wire specialties, white enamel household fixtures.

Greendale, Worcester: wire staples, misc. wire springs, formed specialties and misc. round and flat wires.

Spencer, Mass.: misc. wire goods.

Palmer, Mass.: wire rope, wire clothes lines and picture cords, misc. round and flat wire, wire specialties.

Clinton, Mass.: poultry netting, wire lathing, misc. wire cloth and netting, electrically welded fabrics, perforated metals, misc. specialties.

Forge at Worcester: blt. 1909, f. o. May 26, 1919; 2 forge fires; one 3-ton hammer. (Formerly owned by Spencer Wire Co.; acquired by Clinton-Wright Wire Co., Sept. 15, 1919.) Product: charcoal iron billets from scrap, annual cap. 1,500 tons, for own use.

COES WRENCH CO., 1 Coes Square, Worcester, Mass.

Inc. Mar. 18, 1888 in Massachusetts. Capital stock: com. \$150,000.

Frank L. Coes, P., T., G. S. M. & P. A.; Charles Rose, Sc.; Fred Searle, S.

Selling agent: W. E. Robbins, 23-25 East 26th St., New York.

Works at Worcester: orig. blt. 1846; two 2-d. billet rehear. fur.; 10" 2-h. 2-st. and 9" 2-h. 1-st. bar; 6 forge fires; 4 ham. (200-lb. to 600-lb.). Fuel, anthracite coal and oil. Power, steam and electricity.

Product: welded materials for knife and die work for own use in making machine knives and die stock for cutting dies. Annual cap., 600 to 700 tons knife stock, 200 tons die stock.

COHOES ROLLING MILL CO., Cohoes, N. Y.

Inc. 1901 in New York. Capital stock: com. \$750,000.

W. W. Near, P.; H. Rooke, T.; C. S. Webber, P. A.; at 100 Church St., Toronto, Ontario, Canada. D. H. Friedman, V. P.; David

Muhlfelder, Sc.; at 78 State St., Albany, N. Y. A. Macfadyen, G. S. M.; at 750 Woolworth Bldg., New York. A. W. Smith, G. S.; at Cohoes, N. Y.

Works at Cortland and Canvass Sts., Cohoes, N. Y.: blt. 1854, rebt. 1883; 14 double puddling fur.; 2 busheling fur.; 1 squeezer; three 4-d. gas heat. fur.; 22" 3-h. 1-st. muck mill and 10" and 16" grooved skelp mills; electric and steam power. Fuel, coal for puddling fur.; producer gas for heating fur. Product: grooved skelp for own use, annual cap., 30,000 tons.

Pipe Mill: 1 butt-weld fur.; 1 galvanizing pot. Product: pipe from $\frac{1}{8}$ " to 3", annual cap., 30,000 tons.

COLLINS CO. (The), Collinsville, Conn.

Est. 1826; inc. 1834. Capital stock: \$1,000,000.

William Hill, P. & G. M.; C. H. Smith, G. S.; at Collinsville, Conn. Charles H. Clark, V. P.; W. H. Whaples, Sc. & T.; at Hartford, Conn.

Treasurer's office: Conn. Mutual Bldg., Main St., Hartford, Conn. Sales agent: Collins & Co., 212 Water St., New York, N. Y.

Works at Collinsville, Conn.: two 2-d. scrap and four 2-d. heat. fur.; 18" 2-h. 3-st. and 10" 2-h. 3-st. bar mills; 2 steam ham.; three 20-ton steel cementing fur.; 2 Siemens gas crucible fur. (one 24-pot, one 30-pot); 4 gas prod.; steam and water power. Fuel, coal and producer gas.

Product: bar iron and cast steel for own use in the manufacture of "Collins" edge tools, steel plows, etc. Annual cap., 3,000 tons finished iron, 4,000 tons crucible ingots.

COLONIAL IRON CO., Riddlesburg, Bedford County, Pa.

Inc. May 22, 1899 in Pennsylvania. Capital stock: com. \$300,000. Charles M. Smith, P. & T.; Frederick G. Gottsch, Sc.; M. L. Washburn, A. T. & P. A.; at 149 Broadway, New York. John M. Reynolds, V. P.; at Bedford, Pa. E. P. Ross, G. S.; at Riddlesburg. Selling agents: Henry H. Adams & Co., 149 Broadway, New York. Brands: "Colonial," "Norway" and "Kemble."

Colonial Furnace, Riddlesburg: 1 stack, 75' x 18'; blt. 1911, f. o. Dec. 7, 1911, relined, May, 1918; 3 McClure stoves, 75' x 18'; 2 steam blowing eng. and 1 turbo-blower (30,000 cfm.); 6 water-tube boilers (2,118 H. P.); 1 Pittsburgh Coal Washer Co. single-strand pig casting machine; 1 slag granulating pit. Broad Top coke made from coal mined on the furnace property; Lake ore. 216 beehive coke ovens; annual cap., 80,000 tons. Limestone quarry at McConnellstown, Pa. (not in operation).

Product: foundry, bessemer and low-phosphorus pig iron; annual cap., 60,000 tons.

COLONIAL STEEL CO., 324 Fourth Ave., Pittsburgh, Pa.

Inc. June 3, 1901 in Pennsylvania. Capital stock: com. auth. \$1,250,000, issued \$1,219,100; pref. 7% cum. \$750,000.

D. W. Dunlevy, P.; W. H. Nimick, V. P.; Charles M. Brown, V. P. & G. S. M.; Horace Sisler, Sc. & A.; T. H. Childs, T.; B. M. Trautman, P. A.

Branch offices and warehouses:

Boston, Mass., D. & Fargo Sts.
Chicago, Ill., 213 West Lake St.
Detroit, Mich., 92 Broadway.
New Haven, Conn., 78 State St.
New York, N. Y., 177 Hudson St.
St. Louis, Mo., 928 N. Main St.
Toledo, Ohio, 411 Washington St.

Sales offices:

Cleveland, Ohio, Betz-Pierce Co.
Denver, Col., First National Bank Bldg.
Philadelphia, Pa., Einwechter & Wyeth.
Salt Lake City, Utah, 308 Kearns Bldg.
Brands: "Colonial" and "Red Star."

Works at Colona, Pa.: telegraph address and freight station, Monaca: blt. 1901-02; enl. 1906; 8 crucible fur. (six 24-pot and two 36-pot); 3 B. O. H. fur. (one 25-ton and two 35-ton); first crucible steel made Mar., 1902; first open hearth steel made Aug. 8, 1906; rolling mill and forge blt. 1901-02; 11 single puddling fur.; 1 rotary squeezer; 35 heat. fur. (fourteen 1-d., one 2-d., eight 3-d. nine 4-d. and three 5-d.); 19 gas producers; one 6-hole soaking pit; 28" 2-h. 1-st. blooming, 18" 3-h. 1-st. muck, 16" 3-h. 5-st. bar, 12" 3-h. 6-st. bar, 9" 3-h. 6-st. bar; 22" x 50" 2-h. 4-st. plow, 28" x 80" 3-h. 2-st. saw and plate, 20" x 36" and 18" x 36" sheet mills; 8 annealing fur. (2 box and 6 pipe); 6 hand pickling tanks; 3 forge fires; 9 steam ham. (600-lb. to 8-ton); first products forged Feb., 1902; first products rolled May, 1902. Fuel, coal, producer and nat. gas.

Product: open hearth and crucible steel ingots; alloy steel ingots; slabs, blooms and billets, muck bar; high speed and carbon tool steel; agricultural plates, plow steel, saw blanks, alloy and special steels; die blocks, forgings, etc.; and copper clad steel bars; annual cap., 45,000 tons O. H. steel ingots, 17,000 tons crucible steel ingots; 36,000 tons blooms, billets and slabs; 6,500 tons muck bar; 15,200 tons rolled tool steel, agricultural plates, saw blanks, and alloy and special steel; 3,800 tons rolled copper clad bars; 15,000 tons hammered tool steel bars, die blocks and forgings.

COLORADO FUEL & IRON CO. (The), Denver, Col.

Inc. Oct. 21, 1892 in Colorado. Capital stock: com. auth. \$44,200,000, issued \$34,235,500; pref. 8% cum. \$2,000,000; bonds \$43,144,000.

J. F. Welborn, P.; J. B. McKennan, 1 V. P. & G. M.; J. Chilberg, 2 V. P.; S. G. Pierson, 3 V. P. & T.; Fred Farrar, Sc.; A. W. Sampson, A.; T. Aurelius, S. M.; J. B. Marks, P. A.

Sales offices:

Amarillo, Texas, W. H. Beattie.
 El Paso, Texas, J. C. Durham, 607-8 Mills Bldg.
 Fort Worth, Texas, I. I. Paddock, 405 Burton Bldg.
 Hastings, Neb., T. H. Reasoner, 4 Cramer Bldg.
 Hutchinson, Kan., A. H. Kitto, 503 1st Nat. Bank Bldg.
 Los Angeles, Cal., S. J. Larkin, 600 Citizen Bank Bldg.
 Lincoln, Neb., M. V. Barton, 2415 So. 15th St.
 Oklahoma City, Oklahoma, C. E. Paddock, 1007 Colcord Bldg.
 Portland, Ore., W. E. Madden, 512 Lewis Bldg.
 Salina, Kan., R. J. Copeland, P. O. Box 23.
 Salt Lake City, Utah, F. A. Webster, 408 Walker Bank Bldg.
 San Francisco, Cal., H. E. Stuard, 614 Balboa Bldg.
 Spokane, Wash., F. P. Dillinger, 622 Paulsen Bldg.

Product: pig iron, spiegeleisen, ferro-manganese; steel rails, steel mine rails, splice bars, structural and other shapes, merchant bars, wire rods; bright annealed and galvanized wire; wire nails and staples; barbed wire, field fence, poultry netting, bale ties, etc.; railroad and boat spikes, track bolts, pipe bands, machine and other bolts, nuts and rivets; cast iron gas and water pipe.

Minnequa Works at Pueblo, Col., comprise blast furnaces, Bessemer and open hearth steel works, rolling mills, wire mills, spike factory and bolt and nut factory, cast iron pipe and other foundries, auxiliary shops, etc.

Minnequa Furnaces: 6 stacks:

Furnace.	Size.	Blt.	Rebuilt or Remodeled.	No	Stoves. Size.	First blown in.
A	93' x 21'	1900-1	1917	4	106' x 21'	Sept. 4, 1901
B	75' x 17' 9"	1890-91	1919	3	70' x 18'	Nov. 25, 1892
C	75' x 16' 6"	1880-81	—	1	93' x 21'	
D	93' x 21'	1901-02	1918	5	60' x 15' 5"	Sept. 10, 1881
E	86' x 20'	1901-02	1915	4	106' x 21'	Nov. 20, 1902
F	85' x 20'	1902	—	4	100' x 21'	May 30, 1903
				4	102' x 21'	May 2, 1907

Eleven steam blowing eng. (362,450 cfm.); 88 water-tube boilers, 24,700 H. P., serve also rail mill, converters, pipe foundry, etc.; 2 double-strand pig casting mach (1 Uehling, 1 Heyl & Patterson); Dwight & Lloyd sintering plant for flue dust and concentrates, annual cap., 100,000 tons. By-product coke: ore from Wyoming and New Mexico.

Product: bessemer, basic and foundry pig iron, spiegeleisen and ferro-manganese; annual cap., 625,000 tons.

Bessemer Dept.: orig. blt. 1881-82; f. o. April 11, 1882; rebt. 1901-02; 2 Bessemer converters (12-ton); 2 metal mixers (250-ton); 4 cupolas for pig iron; 1 cupola for spiegel. Fuel, coal, coke and coke oven gas. Annual cap., 600,000 tons ingots.

Open Hearth Dept.: blt. 1902-03; f. o. June 29, 1903; 15 B. O. H.

fur. (60-ton); 2 metal mixers (one 250-ton, one 125-ton); 2 cupolas for spiegel. Fuel, prod. gas, coke oven gas and tar. Annual cap., 538,000 tons ingots, 2,000 tons steel castings.

Rolling Mills: rail mill orig. blt. 1881-82, f. o. April 17, 1882; blooming and billet mill blt. 1902-03, f. o. June 29, 1903; 12 heat. fur. (four 3-d. (gas or coal), 6 cont. (gas), 2 air fur. (coal)); 88 gas prod.; thirteen 4-hole soaking pits; 18 gas prod.; 40" 2-h. 1-st. blooming and billet mill; rail mill with 36" 2-h. 1-st. blooming, 28" 3-h. 1-st. roughing, 26" 3-h. 1-st. and 26" 2-h. 1-st. finishing; 16" 2-h. 6-st. and 14" 2-h. 2-st. cont. roughing and 10" 2-h. 10-st. Garrett rod mill; 10" 2-h. 7-st. Garrett mill for merchant bars with one 14" and six 10" stands; 14" to 12" continuous bar mill with 14" 2-h. 4-st., 14" 3-h. 2-st. and 12" 2-h. 5-st.; 20" 3-h. 3-st., 20" 2-h. 2-st. merchant mill; 12" 3-h. 3-st. and 12" 2-h. 2-st. merchant mill.

Wire Mill: blt. 1902-03, 442 wire drawing blocks, 00 to $\frac{7}{16}$ "; 280 nail mach.; 130 barb wire mach.; 15 wire fence mach.; 7 staple mach.; 21 bale tie mach.; 5 galvanizing pans; 6 cont. electro-galv. mach. Spike, bolt, nut, rivet and washer dept. Forge shop; 5 steam hammers (500-lb. to 2,000-lb.) for own use only. Fuel, coal, prod. gas, coke oven gas and tar.

Cast Iron Pipe Foundry: blt. 1890; f. o. Dec. 1890; annual cap., 18,000 tons cast iron gas and water pipe and specials 4" to 20" dia. Gray iron and ingot mould foundry; annual cap., 14,000 tons ingot moulds (molten metal from Bessemer converters) and 6,600 tons gray iron castings; 1,000 tons air furnace rolls.

Auxiliary Depts.: iron, brass and steel foundries for own use only. Machine, boiler, blacksmith, roll-turning, pipe-fitting, electric repair, carpenter and pattern shops; pattern storage and supply houses. Electric light and power stations.

Product and annual cap.: blooms and billets (350,000 tons), rails (360,000 tons); wire rods (120,000 tons), merchant and concrete bars including spike, bolt, nut and rivet rods (300,000 tons); plain wire (300,000 net tons). Wire nails, 2,500,000 kegs (100-lb.); staples (6,000 tons), bale ties, (12,000 tons); barb wire (75,000 net tons), wire fence (21,800 net tons), galvanized wire (90,000 net tons); track $2\frac{1}{2}$ " x $\frac{5}{16}$ " to 6" x $\frac{5}{8}$ ", and boat spikes $2\frac{1}{2}$ " x $\frac{1}{4}$ " to 12" x $\frac{3}{4}$ ", (400,000 kegs of 200-lbs.); track and machine bolts, nuts and rivets (10,000 tons). Cast iron gas and water pipe, 18,000 tons.

IRON ORE, COAL AND COKE PROPERTIES, ETC.

The Colorado Fuel and Iron Co. owns and controls the Sunrise and Chicago mines in Laramie Co., Wyoming and the Orient mine in Saguache Co., Col. with an annual cap. of 500,000 tons. It also owns and leases iron ore properties in Colorado, Wyoming, Utah, New Mexico and California. The company owns and controls

approximately 300,000 acres of coal lands at Sopris, Engle, Berwind, Rouse, Walsen, Robinson, Pictou, Primero, Starkville, Coal Creek, Fremont, Rockvale, Brookside, Canon, Crested Butte, Anthracite, Floresta, Gulch, Sunlight, Placita, Coalbasin, Tabasco, Hezron, Terico, Cuatro, Quinto, Morley and other points in Colorado. The annual capacity of these mines is about 6,000,000 tons.

The company also owns and operates a by-product coke plant of 120 Koppers ovens, with an annual capacity of 550,000 net tons of coke, at Minnequa Works, Pueblo. A by-product recovery plant and Koppers benzol plant, annual cap. 2,500,000 gals. light oil. It owns 1,464 beehive coke ovens at Sopris, Starkville, Crested Butte, Tabasco, and Terico, Colorado, not operated at present; also owns and operates 800 beehive ovens at Segundo with an annual cap. of 450,000 net tons. It also operates limestone and dolomite quarries at Lime and Calcite, Col., annual cap., 575,000 net tons.

The Colorado Fuel and Iron Co. owns and controls the Crystal River R. R. Co., which operates 20.6 miles of standard-gauge track in Garfield and Pitkin Counties, Col., connecting with the Rio Grande R. R. at Carbondale, Col. It also owns the Colorado & Wyoming R. R. The Northern division of this company operates 13.92 miles of standard-gauge track, in Platte Co., Wyo., extending from Guernsey to Sunrise, connecting with the Colorado and Southern Ry. and Burlington Ry. at Guernsey. The Middle division operates 80.81 miles of track in and around the Minnequa Steel Works at Pueblo, Col. and connects with all railroads entering Pueblo. The Southern division operates 63.22 miles of standard-gauge track in Las Animas Co., Col., extending from Jansen to Terico, Col., and connecting with the Atchison, Topeka and Santa Fe Ry. at Trinidad and Jansen and with the Colorado and Southern Ry. at Sopris and the Denver & Rio Grande Ry. at Jansen.

Columbia Iron & Steel Co., See Port Moody Steel Works, Ltd.

COLUMBIA STEEL CO., 503 Market St., San Francisco, Cal.

Inc. 1909 in Nevada. Capital stock: com. \$500,000.

W. E. Creed, P.; J. D. Grant, V. P.; Russell Pierce, Sc., T. & A.; J. D. Fenstermacher, G. S. M.; at San Francisco. D. H. Botchford, G. M.; at Pittsburg, Cal.

Pittsburg Works, Pittsburg, Cal.: blt. 1909-10; 2 B. O. H. fur. (15-ton and 25-ton); 1 A. O. H. fur. (5-ton); first steel made Nov. 15, 1910. Fuel, oil. Building rolling mill; construction begun, June 15, 1919; 2 cont. oil-fired heat. fur.; 18" 3-h. 4-st., 18" 3-h. 1-st. and 12" 3-h. 5-st. bar.; annual cap., 25,000 tons merchant bars. Product: steel castings for sale; nickel and chrome alloy steel castings; annual cap., 33,000 tons (30,000 tons basic, 3,000 tons acid).

Portland Works, Portland, Ore.: blt. 1903; f. o. May 1, 1903; 1 Tropenas converter (2-ton); 2 cupolas; 1 annealing fur. Fuel, oil. Product: steel castings for sale; chrome and manganese alloy steel castings; annual cap., 2,500 tons.

COLUMBIA TOOL STEEL CO., Chicago Heights, Ill.

Frank Matthiessen, V. P.; Alexander B. Peterson, Sc.; M. H. Kilgallen, T.; A. R. Waters, G. M.

Sales offices:

Chicago, 552 W. Lake St.

Cincinnati, 112 W. 2nd St.

Cleveland, 1289-93 W. 6th St.

Detroit, 100 Randolph St.

Milwaukee, 137 Sycamore St.

Works at Chicago Heights: blt. 1904-5; two 30-pot crucible fur., f. o. May, 1905, annual cap., 5,400 tons of ingots; 4 Swindell gas. prod.; 9 coal-fired heat. fur.; 5 steam ham. (500 to 6,000-lb.); 2 trains (14" with one 2-h. and three 3-h. st.; 9" with three 4-h. and two 2-h. st.); first products rolled May 15, 1905. Fuel, bit. coal and prod. gas.

Product: rolled and hammered tool steel; annual cap., 4,000 tons.

Columbus Chain Co., Columbus, Ohio, see 1916 Directory, p. 108.

West End Rolling Mill at Lebanon, Pa., was dismantled in 1917.

Columbus Iron and Steel Co. (The), Columbus, Ohio, see 1916 Directory, p. 108; was sold to the American Rolling Mill Co., Middletown, Ohio, July 2, 1917.

COMMERCIAL STEEL CASTING CO. (The), Otis St., Marion, Ohio.

Inc. May, 1919 in Ohio. Capital stock: com. \$93,800; pref. non-cum. \$37,000.

J. D. Owens, P.; G. D. Copeland, T.; F. D. Glosser, M.; Robert Laswell, S.; W. A. Griffiths, P. A.; at Marion. C. A. Owens, V. P. & Sc.; at Owens, Ohio.

Works at Otis St., Marion, Ohio: blt. 1918; f. o. Sept. 1, 1918; one 9-ton A. O. H. fur. Fuel, oil.

Product: steel castings for sale; heavy up to six ton; annual cap., 4,000 tons.

COMMONWEALTH STEEL CO., 1626 Pierce Bldg., St. Louis, Mo.

Inc. July, 1902 in New Jersey. Capital stock: com. \$3,000,000. Clarence H. Howard, P.; H. M. Pflager, V. P.; George K. Hoblitzelle, V. P. & T.; George E. Howard, V. P. & S. M.; B. V. H. Johnson, V. P. & S. A.; H. C. Bellville, V. P. & Publicity Director; Frank L. Morey, Sc.; A. W. Carten, P. A.; at St. Louis. Arthur T. Morey, G. M.; Charles F. Frede, Manager of Production; at Granite City, Ill.

Works at Granite City, Ill.: blt. 1902; 4 B. O. H. fur. (20-ton), f. o. Sept. 8, 1902. Fuel, oil.

Product: patented cast steel specialties for locomotive and car construction, for sale; annual cap., 50,000 tons.

Commonwealth Title Insurance & Trust Co. (The), Philadelphia, Pa., see 1916 Directory, p. 109, tinplate plant at Marietta, Ohio, acquired by Pittsburgh Sheet & Tin Plate Co., in 1916.

CONNECTICUT ELECTRIC STEEL CO. (The), 540 Flatbush Ave., Hartford, Conn.

Inc. Feb. 25, 1916 in New York. Capital stock: com. \$5,000; pref. 8% cum. auth. \$150,000, issued \$142,000.

Edwin L. Willson, P. & T.; Samuel Ferguson, Sc.; Charles Margerum, S. M.

Works at Hartford, Conn.: blt. 1916, f. o. Feb. 19, 1917; 2 Heroult electric fur. (2-ton basic and 2-ton acid).

Product: steel ingots and steel castings (1-lb. to 1,000-lb.); nickel and chrome alloy steel ingots and castings; carbon and alloy tool steel; annual cap., 2,800 tons (ingots 1,800 tons, castings 1,000 tons).

Connellsville Electric Steel Co., Connellsville, Pa. Company being organized to take over plant of United States Electric Steel Co.

CONNELLSVILLE FOUNDRY, MACHINE & STEEL CASTING CO., P. O. Box 796, Connellsville, Pa.

Inc. 1905 in Pennsylvania. Capital stock: com. \$200,000; bonds \$75,000.

W. E. Crow, P.; H. A. Bartenslager, Sc.; at Uniontown, Pa. Grant Myers, V. P.; E. R. Floto, T.; G. E. Baker, A.; W. J. Doorley, G. M.; W. Y. Banks, Jr., G. S. M.; at Connellsville, Pa.

Sales offices: Connellsville, Pa., W. Y. Banks, Jr.; Philadelphia, Glen G. Durham, 26 S. 15th St.

Works at Connellsville: blt. 1906; Tropenas converter (4,000-lb.); 1 cupola for pig iron; first converter castings made Sept., 1918. Gray iron, brass and bronze foundries.

Product: steel castings for sale for mine and mill work; gray iron, brass and bronze castings; annual cap., 12,000 tons steel, 7,200 tons gray iron, 300 tons brass and bronze castings.

CONNOLLY STEEL CASTING CO., Clark Ave., near Webster Ave., Chelsea, Mass.

Inc. Oct. 17, 1910 in Massachusetts.

Capital stock: com. auth. \$5,000, issued \$2,100.

Julia Connolly, P.; James Connolly, T., G. M., G. S. M. & P. A.; Archibald Munroe, Sc.

Works at Clark Ave., Chelsea: blt. 1900; two 6-pot crucible fur.; f. o. Oct. 29, 1910. Fuel, oil. (Leased by the Connolly Steel Casting Co., Oct. 17, 1910; owned by J. M. Mason, 77 Webster Ave., Chelsea, Mass.).

Product: crucible steel castings for sale for tools, machinery, etc.; annual cap., 160 tons.

CONNORS STEEL CO., Inc., Brown-Marx Bldg., Birmingham, Ala.
Inc. Jan. 1, 1918 in Alabama. Capital stock: \$300,000.

George W. Connors, P. & G. M.; W. M. Hoke, V. P., T. & P. A.; S. S. Paul, Sec. & G. S. M.; G. L. McCullough, A.; J. H. McDaniel, G. S.

Works at Woodlawn, Birmingham, Ala.: 1 cont. heat. fur.; 1 hoop and tie mill (12" 3-h. roughing, 8" 3-h. finishing). Fuel, coal. (Formerly the Bullard Car Door Co. Purchased by G. W. Connors in 1916 and enlarged and repaired; taken over by Connors Steel Co., Jan. 1, 1918.)

Product: hoops, light bands and cotton ties; annual cap., 15,000 tons.

CONNORS-WEYMAN STEEL CO., Brown-Marx Bldg., Birmingham, Ala.

Orig. inc. 1908; reinc. Dec., 1918 in Delaware. Capital stock: com. \$100,000.

George W. Connors, P. & G. M.; W. M. Hoke, 2 V. P., T. & P. A.; S. S. Paul, Sec.; G. L. McCullough, A.; T. B. Rutherford, G. S.; at Birmingham. S. T. Weyman, J. V. P.; at Grant Bldg., Atlanta, Ga.

Works at Helena, Ala.: blt. 1873, enl. 1889; 2 cont. billet rehear. fur.; 16" 3-h. billet mill and 9" 3-h. hoop and cotton tie mill. Fuel, bituminous coal.

Product: hoops, light bands and cotton ties, annual cap., 15,000 tons.

CONSOLIDATED STEEL CORPORATION, 165 Broadway, New York, N. Y.

Inc. Jan. 2, 1919 in Delaware. Capital stock: com. auth. \$10,000,000, issued \$1,235,000.

E. A. S. Clarke, P.; Henry H. Barbour, V. P.; L. W. Hesselman, Sec. & C.; M. M. Michael, T.; Frank Purnell, G. S. M.

Sales offices:

Barcelona, Spain.

Buenos Aires, Argentina, Balcarce 160.

Calcutta, India, 6 Hastings St.

Christiania, Norway, Krunprinsegate, 3.

Copenhagen, Denmark, Norrevoldgade 18.

Havana, Cuba, Royal Bank of Canada Bldg.

Johannesburg, South Africa, Southern Life Building.

Lima, Peru.

London, England, 139 Fenchurch St.

Mexico City, Mexico, la Calle de San Juan de Letran 15.

Milan, Italy, Via Leopardi 14.

Montreal, Canada, Eastern Township Bank Bldg.

Rio de Janeiro, Brazil, Rua de Alfandega 5.

San Francisco, California, Monadnock Bldg.

Santiago, Chile, Calle Compania, 1264.

Seattle, Washington, L. C. Smith Bldg.

Shanghai, China.

St. Johns, Newfoundland.

Stockholm, Sweden.

Sydney, Australia.

Toronto, Ontario, Canada, Royal Bank Bldg.

Valparaiso, Chile, Calle Blanco 1002.

Wellington, New Zealand, 235 Lambton Quay.

This company is organized under the Webb Act. It does not manufacture products of any kind, but acts as the exclusive export sales agent of the commercial iron and steel products of its member companies, which are as follows:

Bethlehem Steel Co.; Brier Hill Steel Co.; Cambria Steel Co.; Lackawanna Steel Co.; Lukens Steel Co.; Republic Iron & Steel Co.; Midvale Steel & Ordnance Co.; Sharon Steel Hoop Co.; The Trumbull Steel Co.; Whitaker-Glessner Co.; and The Youngstown Sheet and Tube Co.

It also acts as export sales agent for the following companies and products:

Railway Steel Spring Co.: Tires and tire mill products and steel-tired wheels.

Edgewater Steel Co.: Tires and tire mill products, steel-tired wheels and rolled steel wheels.

Standard Steel Works Co.: Tires and tire mill products and steel-tired wheels.

Midvale Steel & Ordnance Co.: Tires and tire mill products and steel-tired wheels.

Cambria Steel Co.: Rolled steel wheels.

LIST OF PRODUCTS EXPORTED.

The Consolidated Steel Corporation exports: pig iron, ferromanganese, bessemer and basic open-hearth steel billets and slabs, sheet and tinplate bars, ingots, ingot molds and skelp.

Steel rails, splice bars, tie plates, bolts, nuts, spikes and other accessories, crossings, frogs, switches and other special work for steam and electric railways.

Beams, channels, angles, tees, Bethlehem sections, steel plates for shipbuilding, tanks, boilers, etc.; flange and fire box steel; black, galvanized, blue annealed and painted steel sheets, flat and corrugated; and steel hoops, bands and hot and cold rolled strip; cotton ties.

Merchant bars, rounds, squares, flats, ovals, hexagons and other bar shapes; Slick concrete reinforcing bars; special iron and steel for bolts, rivets, shafting, etc.; cold-rolled and cold-drawn shafting; forged axles for locomotives, railway and tramway cars; steel tires for locomotives and cars; rolled steel wheels and steel-tired wheels.

for railway and tramway cars; ship anchors; agricultural steel, such as plow discs, harrow discs, drag teeth, cultivator teeth, etc.; alloy steels; ore crushing parts, roll shells, ring dies, stamp shoes and dies, crusher balls, etc.; circular sections such as gear blanks, pipe flanges, industrial wheels of all kinds and forgings, marine and commercial.

Black and galvanized wrought pipe for gas, water, steam and other purposes; mild steel and charcoal iron boiler tubes for stationary, locomotive and marine work; English gas and steam tubes, casing, tubing and drive pipe for oil and artesian wells; gas and oil line pipe.

Wire rods; drawn steel wire of every description; barbed wire; plain and galvanized wire of various grades; woven wire fencing, fence staples; wire nails; wire bale-ties; wire hoops; wire rope cables and hawsers; wire rope.

Tinplates—coke and terne; black plates for tinning, stamping, enameling and other purposes.

Castings of iron, brass or steel.

Conduit—rigid and flexible electric.

Bolts and nuts, rivets, washers, turnbuckles, wood screws and pole line material.

Passenger and freight cars.

Machinery for mills, shops, shipyards, heavy duty planers and boring, drilling and milling machines; hydraulic presses; gas and pumping engines.

Designs and estimates submitted for bridges and steel building, erected complete or prepared ready for erection.

Cook (A. D.), Lawrenceburg, Ind. (Owner).

Works at Lawrenceburg: small crucible steel melting fur. and 2-st. 2-h. rolls.

Product and annual cap.: crucible steel castings (50 tons); iron pump rods, 200 tons; for own use only.

Copake Iron Works, see W. A. Miles.

COPPER CLAD STEEL CO., Rankin, Pa.

Inc. May, 1914 in Pennsylvania. Capital stock: com. \$400,000. J. M. Roth, P.; James H. Hammond, V. P.; S. E. Bramer, V. P. & G. M.; F. R. S. Kaplan, Sc.; S. F. Loeb, T.; W. M. Page, S. and metallurgist.

Western sales office: Steel Sales Corp., Chicago.

Works at Rankin: blt. 1915, f. o. 1915; 18" to 10" rod mill for rolling copper clad rods. Wire mill. Electric power.

Product: Aristos "Copperweld" copper clad steel rods and wire, annual cap., 6,000 tons.

Cordova Mines, Ltd., Cordova Mines, Ontario, Canada.

P. Kirkegaard, P. & G. M.; W. H. Price, V. P. & T.; Edward T. Willan, Sc.

Works at Cordova Mines: completed Feb., 1919; 1 three-phase electric fur. Hydro-electric power from own power plant. Built for manufacture of ferro-chrome, plant idle; future product not decided.

Cornwall Iron Co. formerly owned the Bird Coleman Furnaces and North Cornwall Furnace, acquired by Bethlehem Steel Co., see Bethlehem Steel Co.

COWIN (FREDERICK) & CO., Inc., 76 West Monroe St., Chicago, Ill. Inc. Mar. 1, 1913 in Delaware. Capital stock: com. \$500,000; pref. 7% cum. \$250,000.

F. Cowin, P.; S. B. Thompson, V. P. & G. S. M.; L. B. Patterson, T.; R. Reilly, G. S.

Works at Joliet, Ill.: blt. June, 1907; f. o. Aug. 27, 1908; 7 busheling fur. 6 single sand, 1 double cinder; 1 squeezer; six 4-d. reverb. coal-fired fur.; 22" 3-h. muck., 16" 3-h. 3-st. bar, 12" 3-h. 3-st. guide and 8" 3-h. Belgian with one 12"-st. and four 8"-st. Fuel, bituminous coal. Works closed; reported sold to Joliet Forge Co. Product: merchant bar iron, rounds, squares and flats; annual cap., 50,000 tons.

CRANBERRY FURNACE CO. (The), Johnson City, Tenn.

Inc. Sept. 6, 1901 in New Jersey. Capital stock: com. \$100,000. F. P. Howe, P. & G. M.; Ario Pardee, V. P.; at Philadelphia. Hammond Prosser, Sc. & T.; S. F. Boren, Furnace S.; at Johnson City.

Offices: Newark, N. J., Prudential Bldg.; Philadelphia, 253 Drexel Bldg.; and Johnson City, Tenn.

Selling agent: Crocker Brothers, 21 East 40th St., New York.

Brand: "Cranberry."

Cranberry Furnace, Johnson City, Tenn.: 1 stack, 75' 9" x 17'; f. o. Jan. 2, 1899; relined 1919; 4 Whitwell stoves, 69' x 18'; 3 steam blowing eng. (21,000 cfm.); 12 horizontal flue boilers (850 H. P.). Wise Co. coke; Cranberry ore from company's mines at Cranberry, N. C., annual cap., 70,000 tons. Owns limestone quarry at Milligan College, Tenn., annual cap., 40,000 tons.

Product: standard low-phosphorus pig iron; annual cap., 36,000 tons.

CRANE COMPANY, Chicago, Ill.

Org. 1855; inc. 1865. Capital stock: com. \$17,000,000; bonds \$7,800,000.

R. T. Crane, Jr., P.; John B. Berryman, 1 V. P.; A. D. MacGill, V. P. & T.; C. A. G. Wayman, V. P. & G. S.; E. H. Raymond, V. P.; P. T. Kelly, A. T.; C. D. Little, G. S. M.; H. P. Bishop, Sc.; D. G. Park, A. Sc.; J. S. Bell, A. Sc.; W. A. Beville, P. A.

Plants at Chicago, Ill., and Bridgeport, Conn.: 53 branch warehouses in the larger cities.

Steel foundry at Jefferson Ave., Chicago, converted to other uses.

Equipment moved 1918 to new plant at 41st Street and Kedzie Ave. Chicago Works, Chicago: manufacture of valves and fittings. Est. 1855; steel foundry added 1906-07; first steel made Jan. 2, 1907; 2 Zenzes converters (3-ton); 1 cupola; 1 Heroult electric furnace (6-ton).

Product: soft steel for own use for valves and fittings, annual cap., 18,000 tons. Also make brass, gray iron, ferro-steel and malleable iron castings.

CROMWELL STEEL CO. (The), Sincere Building Cleveland, Ohio.

Inc. Sept., 1917 in Ohio. Capital stock: com. auth. \$3,500,000, issued \$3,260,000; bonds \$2,000,000.

Veryl Preston, P. & T.; George H. Beaumont, V. P.; H. A. Raymond, V. P.; Harold T. Clark, Sc.; George W. Way, G. S. M.; at Cleveland. H. A. Lawrence, A. & A. T.; W. S. Greenawalt, G. M.; G. Stahlnecker, Mill S.; at Lorain.

Works at Lorain, Ohio: 4 B. O. H. fur. (90-ton); blt. 1917; f. o. Aug., 1917; rolling mill blt. 1917-18; f. o. 1918; three 4-hole soaking pits; one 30" 2-h. 2-st. reversing bar mill; one 20-ton steam hammer. Fuel, oil.

Product: steel ingots, seamless tube rounds and forging bars; annual cap., ingots, 200,000 tons, rolled products, 150,000 tons.

CROWLEY CO. (John A.), 120 Liberty St., New York, N. Y.

Inc. 1908 in New York. Capital stock: com. \$100,000.

John A. Crowley, P. & T.; Samuel A. Thomas, Sc. & P. A.; at 120 Liberty St., New York. Hartley C. Wolle, V. P., G. M. & G. S.; at Detroit, Mich.

Works at Detroit: blt. 1915; 2 Gronwall-Dixon electric fur. (6-ton, 12-ton).

Product: steel ingots and steel castings for sale; nickel, chromium, vanadium, manganese, and tungsten alloy steel ingots and castings; annual cap., 15 000 tons.

CRUCIBLE STEEL CASTING CO., Lansdowne, Pa.

Inc. 1905 in Pennsylvania. Capital stock: com. \$200,000.

C. R. H. Cunningham, P.; H. Bloodsworth, 1 V. P. & T.; H. C. Cunningham, Sc.; at Lansdowne. C. R. Hoopes, 2 V. P.; at Philadelphia, Pa.

Works at Lansdowne, Pa.: blt. 1905; four 8-pot crucible fur., f. o. July 25, 1905, dismantled Aug., 1915; 2 Tropenas converters (1-ton); 1 cupola. Fuel, coke. Will install one 2-ton Heroult electric fur.; annual cap., 1,500 tons.

Product: steel castings for sale; vanadium, nickel and chrome alloy steel castings; annual cap., 4,000 tons.

CRUCIBLE STEEL CASTING CO., 612 Clinton St., Milwaukee, Wis.

Inc. Sept. 24, 1898 in Wisconsin.

Frederick A. Lange, P. & T.; Albert C. Lange, 1 V. P.; Elmer O. Lange, 2 V. P.; Walter W. Lange, Sc.

Works at 612 Clinton St., Milwaukee: blt. 1898; first crucible steel made Dec., 1898; crucible fur. dismantled June, 1915; Snyder electric fur. (1-ton) added 1913.

Product: electric steel castings for sale; annual cap., 3,000 tons.

CRUCIBLE STEEL CASTINGS CO. (The), Cleveland, Ohio.

Inc. 1911 in Ohio. Capital stock: com. \$25,000.

W. H. Shepard, P.; M. G. Tielke, V. P. & T.; H. F. Tielke, Sc.; H. L. Aiken, G. M.

Works at 800 Canal Road, Cleveland: blt. 1909; first steel made Dec. 29, 1909; four 10-pot crucible fur. dismantled Feb., 1916; one 1-ton Heroult electric fur. f.o. Mar. 25, 1916. Fuel, oil and nat. gas.

Product: small steel castings for sale; chrome, nickel and vanadium alloy steel castings; annual cap., 1,500 tons.

CRUCIBLE STEEL CO. OF AMERICA, Oliver Building, Pittsburgh, Pa.

Inc. July 21, 1900 in New Jersey. Capital stock: com. \$25,000,000; pref. 7% cum. \$25,000,000.

H. S. Wilkinson, P.; John A. Mathews, 1 V. P.; George E. Shaw, 2 V. P. & T.; J. W. Dougherty, 3 V. P.; H. F. Kress, Sc.; H. L. Gellinger, A. A.; G. M. Black, G. S.; R. Michener, G. S. M.; at Pittsburgh. R. H. Illingworth, 4 V. P.; at P. O. Box 326, Newark, N. J.

Sales offices:

Domestic sales offices:

Baltimore, Md., 8 South Frederick St.

Boston, Mass., 381-389 Congress St.

Buffalo, N. Y., 69 Carroll St.

Chattanooga, Tenn., Foundry & Newby Sts.

Chicago, Ill., 650-4 W. Washington Blvd.

Cincinnati, Ohio, 209-11 Third St.

Cleveland, Ohio, 721-27 N. W. Lakeside Ave.

Denver, Col., 1225-27 Wazee St.

Detroit, Mich., 473-7 LaFayette St.

Hartford, Conn., 70 Market St.

Indianapolis, Ind., 437-439 South Illinois St.

Louisville, Ky., 331 West Main St.

Milwaukee, Wis., 112-14 Claybourn St.

Montreal, Canada, 19 St. Peter St.

New Haven, Conn., 336 York St.

New York, N. Y., 420 Canal St.

Philadelphia, Pa., 1224-8 Callowhill St.

Providence, R. I., 116 Clifford St.

St. Louis, Mo., 1518-22, N. 9th St.

St. Paul, Minn., Endicott Building.

San Francisco, Calif., 536-48 Folsom St.
 Seattle, Wash., 1000 South 1st Avenue.
 Springfield, Mass., 118 Liberty St.
 Syracuse, N. Y., Fayette & Magnolia Sts.
 Toronto, Canada, 163-65 W. Richmond St.
 Washington, D. C., 407 Evans Building.

Foreign sales offices :

Berlin, Germany.
 Hong Kong, China.
 London, England.
 Melbourne, Australia.
 Paris, France.
 Tokyo, Japan.

Foreign sales agencies :

Amsterdam, Holland.
 Basle, Switzerland.
 Barcelona, Spain.
 Buenos Aires, Argentina.
 Christiana, Norway.
 Copenhagen, Denmark.
 Havana, Cuba.
 Milan, Italy.
 Santiago, Chile.
 Stockholm, Sweden.

Properties :

The company owns the entire capital stock of the Pittsburgh Crucible Steel Co., Crucible Fuel Co., and Halcomb Steel Co. It owns and operates directly the following works :

Anderson-DuPuy Spring Works, McKees Rocks, Pa.

Atha Works, Harrison, N. J.

Black Diamond (Park) Works, Pittsburgh, Pa.

Cayuga Works, Auburn, N. Y.

Crescent Works, Pittsburgh, Pa.

La Belle Works, Pittsburgh, Pa.

Norwalk Works, Norwalk, Ohio (leased).

Ordinance Dept., Harrison, N. J.

Sanderson Bros. Works, Syracuse, N. Y.

Singer-Nimick Works, Pittsburgh, Pa.

Spaulding-Jennings Works, Jersey City, N. J.

Anderson-DuPuy Spring Works, McKees Rocks, Pa. Product : heavy coil and flat spring for railroad and government service ; annual cap., 20,000 tons.

Atha Works, Harrison, N. J. : blt. 1888-9 ; 4 crucible fur. (two 30-pot, two 48-pot) ; 2 A. O. H. fur. (40-ton, 50-ton) ; 4 Heroult electric fur. (three 6-ton, one 3-ton) ; 74 heat. fur. (thirteen 1-d., twenty-three 2-d., fourteen 3-d., eighteen 4-d., four 5-d., one 6-d., one 7-d.) ; 9 gas prod. ; 1 soaking pit ; four 21" 2-h. rifle barrel mills

(three 2-st., one 1-st.); 16" 3-h. 5-st.; 12" 3-h. 5-st.; 10" 3-h. 8-st. and 10" 2-h. 1-st.; 9" 3-h. 4-st.; 9" 3-h. 11-st.; 8" 3-h. 5-st.; 10 box annealing fur.; 8 pickling machines; 24 steam ham. (600-lb. to 10-ton); 4 hydraulic presses (500-ton to 2,000-ton). Fuel; prod. gas, oil and coal. Product: steel ingots, tool, die, spring and cutlery steel, merchant bar, wire rods and forgings; annual cap., 64,850 tons ingots (28,800 tons O. H., 26,050 tons electric, 10,000 tons crucible); 60,000 tons rolled products, 54,000 tons forged products.

Black Diamond Works, 30th St., Pittsburgh: blt. 1862; 8 crucible fur. (330 pots total), annual cap., 21,000 tons ingots; 7 B. O. H. fur. (47-ton, four 45-ton, 40-ton, 30-ton), annual cap., 134,000 tons; one 27-ton A. O. H., annual cap., 11,500 tons; 2 Heroult electric fur. (6-ton), annual cap., 11,000 tons; 56 heat. fur. (three 1-d., eleven 2-d., twenty-one 3-d., twelve 4-d., three 5-d., six 6-d.); six sheet steel annealing fur.; five 1-d. reheat. fur.; 27¼" 2-h. 1-st. blooming; 20" 2-h. 2-st.; 18" 3-h. 1-st. and 16" 3-h. 1-st. cogging; 21" 3-h. 3-st. and 18" 2-h. 2-st. finishing; 14" 3-h. 5-st., 14" 3-h. 4-st., 12" 3-h. 5-st., 10" 3-h. 6-st.; 10" 3-h. 4-st., 10" 3-h. 5-st. and 9" 3-h. 5-st. bar mills; 2 sheared plate mills (32" x 115" 3-h., 26" x 86" 2-h.); 5 sheet mills (20" x 43", two 20" x 36", 20" x 30", 20" x 26"); 5 box annealing fur.; 12 hand pickling tanks; 25 steam hammers (750-lb. to 5-ton). Fuel, coal, coke, nat. gas and oil. Product: carbon and high speed tool steel, spring steel, high grade plates, safe steel and circular saw plates, reaper, guard and shovel plate; die blocks, forgings; annual cap., 177,500 tons ingots, 127,000 tons finished rolled products, 7,200 tons forged products.

Cayuga Works, Auburn, N. Y.: blt. 1917; first rolled products Oct. 1, 1917; 9 heat. fur. (one 1-d., two 2-d., six 3-d.); 14" 3-h. merchant mill; 3 box annealing fur.; 4 steam ham. (600-lb. to 10,000-lb.). Fuel, bit. coal. (Formerly owned by the Cayuga Tool Steel Co.; acquired by the Crucible Steel Co. of America, Oct. 12, 1918.) Product: hammered and rolled carbon and alloy tool steel in rounds, squares, and rectangular bars; discs, die blocks, ring forgings; annual cap., 300 tons rolled products, 2,400 tons forged products.

Crescent Works, 57th St. & A. V. R. R., Pittsburgh: blt. 1865; 5 crucible fur. (204 pots total), annual cap., 16,000 tons ingots; 3 B. O. H. fur. (25-ton), annual cap., 40,000 tons ingots; 53 reheat. fur. (twenty three 1-d., nine 2-d., ten 3-d., eight 4-d., 3 special); 20 gas producers; 18" 2-h. 3-st. and 16" 2-h. 3-st. sheet; 16" 3-h. 4-st. band; 14" 3-h. 5-st., 12" 3-h. 4-st., 12" 3-h. 6-st., 9" 3-h. 4-st., 9" 3-h. 5-st. and 8" 3-h. 5-st. bar mills; 1 cold mill with 4-st.; 7 annealing fur.; 5 hand pickling tanks; 20 steam ham. (500-lb. to 12,000-lb.). Fuel, coal, coke, nat. gas and prod. gas. Reduction works for reducing tungsten and vanadium ore, annual cap., 1,070 gross tons. Product: hammered and rolled crucible and

open-hearth steel for tools, drills, and machinery; annual cap., 56,000 tons ingots, 10,000 tons finished rolled products, 7,500 tons forged products.

La Belle Works, Ridge Ave. & Rebecca St., North Side, Pittsburgh: blt. 1863; 3 crucible fur. (42-pot), annual cap., 8,000 tons ingots; 2 A. O. H. fur. (15-ton), annual cap., 15,000 tons ingots; 34 heat. fur. (eight 1-d., nine 2-d., fourteen 3-d., three 4-d.); 2 gas prod.; 24" 2-h. 4-st., 20" 2-h. 4-st., 20" 2-h. 4-st. bar or plate; 16" 2-h. 4-st. bar; 14" 3-h. 5-st., 10" 3-h. 6-st., 10" 3-h. 4-st., 9" 3-h. 4-st. guide mills; 4 box annealing fur.; 1 hand pickling tank; 8 steam hammers (800-lb. to 7-ton). Fuel, coal, prod. and nat. gas. Product: merchant steel, harrow discs, forgings and die blocks, tool, machinery steel, flats, rounds, squares, double bevel table cutlery steel, chrome, nickel, and vanadium alloy steel for automobiles and aeroplanes; annual cap., 23,000 tons ingots, 33,000 tons rolled products.

Norwalk Works, Norwalk, Ohio (leased): blt. 1902-03; 2 B. O. H. fur. (20-ton); four 4-d. heat. fur.; 4 gas prod.; 12" 3-h. 5-st. bar mill; 24" x 42" 2-h. sheared plate mill; 3 steam hammers (750-lb. to 10,000-lb.). Fuel, nat. gas and prod. gas. Product: hammered and rolled machinery, spring and plow steel, die blocks, discs, carbon and alloy tool steel; annual cap., 15,000 tons ingots, 7,500 tons tool steel bars, 10,500 tons agricultural implement shapes and bars.

Sanderson Works, Syracuse, N. Y.: blt. 1876; six 24-pot and four 12-pot crucible fur.; two 3-ton Heroult electric fur. added 1919; 21 heat. fur. (twelve 2-d., five 3-d., four 4-d.); 10 gas producers; 12" 3-h. 5-st., 10" 3-h. 7-st. and 9" 3-h. 6-st. bar mills; 16" x 24" 2-h. jobbing plate mill; 5 box annealing fur.; 9 steam ham. (700 to 8,000-lb.). Cold drawing dept.: 21 wire drawing blocks; 1/2" to No. 80 Stubbs drill rods. Fuel, bit. coal. Product: hammered and rolled crucible steel, carbon and alloy tool steel, high speed steel, high speed and carbon drill rods, etc.; annual cap., 21,700 tons ingots (15,000 tons crucible, 6,700 tons electric); 8,000 tons rolled products, 2,400 tons forged products, 1,800 net tons wire and drawn products.

Singer-Nimick Works, West Carson St., Pittsburgh, Pa.: blt. 1848; 3 crucible fur. (two 24-pot, one 36-pot); 24 reverb. heat. fur. (twenty 1-d., one 2-d., two 3-d., one 4-d.); 2 gas producers; 10" 3-h. 4-st. guide; 14" 3-h. 4-st. bar; 18" 3-h. 4-st. band; 16" 2-h. 3-st. bar mill; four 12" 3-h. 1-st. and four 10" 2-h. 1-st. cold strip mills; 22" 2-h. and 28" 3-h. sheared plate mills; 20" 3-h. and 18" 3-h. hot sheet-mills; 3 box annealing fur. Fuel, bit. coal and prod. gas. Product: saw steel of all kinds; solid cast crucible and open hearth plow steel shapes, soft center plow steel shapes, agricultural implement shapes, finished rolling coulter blades; cold drawing tool and alloy die, shafting, and axle steel; special shaped cold rolled tool,

alloy and strip steel. Annual cap., 8,000 tons ingots, 25,000 tons finished products.

Spaulding-Jennings Works, Jersey City, N. J.: blt. 1880, enl. 1900; three 4-d. reverb. heat. fur.; 18" mill with 18" 3-h. 1-st. and 18" 2-h. 3-st.; 3 steam ham. (800, 1,000, 1,800-lb.); 90 cold rolling mills (four 4", four 5", twenty-six 6", six 6½", twenty-seven 8", one 9", sixteen 10", six 12"); 4 annealing fur.; 3 pickling mach., 4 hand pickling tanks; 96 wire drawing blocks for wire 11½" to .030". Product: flat and round wire rods, bright drawn steel, flat wire, cold rolled flat wire, cold rolled spring and tool steel. Annual cap., 4,500 tons wire rods, 3,600 net tons plain wire.

Total annual capacity: 366,050 tons ingots (189,000 tons basic and 55,300 tons acid open hearth, 43,750 tons electric, 78,000 tons crucible); 285,800 tons rolled products, 73,500 tons forged products.

Crucible Steel Forge Co., Cleveland, Ohio. Organized in 1904. Steel ingots first produced in Nov., 1916. Sold to Electric Steel and Forge Co., Cleveland, Ohio, April 1, 1918.

CURTIN FORGE CO., Curtin, Pa.; telegraph address, Bellefonte, Pa. Org. 1897.

J. M. Curtin, P.; at Pittsburgh. H. L. Curtin, V. P. & G. M.; at Curtin. John Curtin, T.; at Bellefonte.

Brand: "Curtin."

Works at Curtin: blt. 1809; remodeled 1901; 12 knobbling fires; one 6-ton hammer; one 14" 3-h. 2-st. skelp mill added in 1918, f. o. that year. Water power. Fuel, charcoal.

Product: charcoal blooms and slabs from scrap and pig iron; charcoal iron skelp. Annual cap., 3,000 tons blooms and slabs, 3,000 tons iron skelp.

Curtis & Co. Mfg. Co., see St. Louis Steel Foundry Co.

CYCLOPS STEEL CO., Inc., 120 Broadway, New York, N. Y.

Inc. March, 1916 in New York. Capital stock: com. auth. \$250,000, issued \$200,000; pref. 8% cum. auth. \$250,000, issued \$200,000.

Carl F. Boker, P. & T.; Russell A. Cowles, V. P.; C. Monteith Gilpin, Sc.; at 120 Broadway, New York. Hermann D. Boker, V. P.; at Titusville, Pa.

Sales offices:

Chicago, 827 Marquette Bldg.

Cleveland, 1221 Superior Ave.

Detroit, 203 Monroe Ave.

New York, 120 Broadway.

Works at Titusville, Pa.: blt. 1879; rebld. 1884; 4 crucible fur. (114-pots total); 6 single puddling fur.; 16 heat. fur. (three 1-d.,

ten 2-d., three 3-d.); 18" 2-h. 2-st.; 12" 3-h. 6-st.; 10" 3-h. 7-st merchant mills; 4 box annealing fur.; 14 steam hammers (500-lb. to 10,000-lb.). Fuel, coal.

Product: high speed, carbon and alloy tool steel, and special tool steel; annual cap., steel ingots, 9,000 tons; rolled products, 2,000 tons muck bar, 5,000 tons tool steel bars; forged products, 1,500 tons.

Cyclops Steel Works, Titusville, Pa., see 1916 Directory, p. 116, was acquired by Carl F. Boker, on March 1, 1916, and transferred to the Cyclops Steel Co. on the same date.

DAMASCUS CRUCIBLE STEEL CASTING CO., P. O. Box 253, New Brighton, Pa.

(Partnership) Capital \$200,000.

Charles Capper, P. & G. M.; C. H. Capper, Sc. & T.; E. J. Stauffer, P. A.; at New Brighton. T. G. Bateman, G. S.; at Beaver, Pa.

Works at New Brighton: blt. 1900-1; f. o. Feb. 5, 1901; 24-pot crucible steel fur. dismantled, Feb. 10, 1917; 1 Heroult electric fur. (2-ton), blt. 1916-17; f. o. Feb., 1917. Fuel, bituminous coal. Will install one 1-ton Whiting converter in July, 1920; annual cap., 800 tons.

Product: steel castings for sale; manganese steel castings; annual cap., 750 tons electric steel castings.

Daniels, Frank A., New Orleans, La., see 1916 Directory, p. 117.

Star and Crescent Furnace, near Rusk, Texas, was sold Oct. 1, 1917 to Tennessee Valley Iron & Railroad Co., dismantled in 1917 and rebuilt at Collinwood, Tenn. in 1918-20.

DANVILLE IRON & STEEL CO., Danville, Pa.

Inc. Aug. 17, 1906 in Pennsylvania. Capital stock: com. auth. \$250,000, issued \$200,000.

Thomas J. Price, P.; Irvin Vannan, V. P.; Edward W. Peters, Sc., G. S. M. & P. A.; John R. M. Curry, T.

Works at Punxsutawney, Pa.: blt. 1908; f. o. Jan. 1, 1909; two 4-d. heat. fur.; 12" 3-h. 1-st. Belgian roughing; 8" 3-h. 5-st. finishing. Fuel, bituminous coal. (Formerly owned by the Clark Steel Hoop Co.; acquired by the Punxsutawney Iron & Steel Co., Mar. 20, 1916 and sold by them to the Danville Iron & Steel Co., April 27, 1917.)

Product: merchant bars; annual cap., 10,000 tons.

DANVILLE STRUCTURAL TUBING CO., Danville, Pa.

Inc. Nov. 1, 1915 in Pennsylvania. Capital stock: com. auth. \$600,000, issued \$350,000.

C. S. Wagner, P. & Sc.; S. C. Rebman, V. P. & T.

Works at Danville: orig. blt. 1847; 5 heat. fur. (2-d.); 18" 3-h. 2-st. billet mill; two 16" 3-h. 3-st. skelp, equipped with patent tube-making machines; 1 hand pickling tank. Fuel, coal.

Product: structural tubing (round unwelded tubing from $\frac{3}{4}$ " to $2\frac{3}{8}$ " O. D.) and shapes for agricultural implements, bedsteads, brake beams, trolley bracket arms, railings, fence posts, etc.; annual cap., 12,000 tons.

Darlington Steel Casting Co., Darlington, Pa., see 1916 Directory, p. 117; was sold to the Stroh Steel Hardening Process Co., Pittsburgh, Pa., May 27, 1916. Damaged by fire in 1917 and abandoned.

Davidson, Charles, Connellsville, Pa., see 1916 Directory, p. 118.
Sligo Rolling Mills acquired by Sligo Iron & Steel Co., in March, 1917.

DAVIDSON MFG. CO., Ltd. (The Thomas), 187 Delisle St., Montreal, P. Q., Canada.

Inc. July 6, 1911 in Dominion of Canada. Capital stock: com. auth. \$5,000,000, issued \$1,514,300; bonds \$354,900.

James Davidson, P.; T. C. Davidson, 1 V. P.; E. Goodwill, 2 V. P. & G. S. M.; T. R. Davidson, 3 V. P. & G. M.; D. W. Dickson, Se.; A. H. Brodie, G. S.

Sales offices:

Toronto, J. H. Flack, 120 Duke St.

Winnipeg, R. W. Robinson, 25 May St.

Works at Montreal: blt. 1915-16; f. o. 1916; 6 electric fur. (four 6-ton, one 1½-ton own design; one 1-ton Snyder electric fur.); gray iron foundry (4,000 tons).

Product: steel ingots and castings for sale; nickel, chrome and manganese alloy steel ingots and castings; railroad, ship and general castings; annual cap., 22,500 tons ingots, 15,000 tons castings.

DAVIDSON TOOL MANUFACTURING CORPORATION (The), 120 Maiden Lane, New York, N. Y.

Inc. Aug. 3, 1918 in New York. Capital stock: com. \$250,000.

A. C. Davidson, P.; R. B. Huestis, V. P. & G. S. M.; H. Fitzpatrick, Sc.; Grace Green, T.; F. Thomas Bristol, A.; P. J. Morson, G. M.

Sales offices: New York, R. B. Huestis; Detroit, Alex. Hart, Jr.

Works at 58-62 North 6th St., Brooklyn, N. Y.: one 12-pot crucible fur.; crucible steel first made Aug. 6, 1918; one ½-ton Greaves-Etchells electric fur. installed Jan., 1919; first electric steel made Mar. 26, 1919.

Product: tool steel bars; high speed steel; chrome, tungsten and vanadium alloy steel; annual cap., 250 tons electric, 175 tons crucible steel.

DAVIS BROTHERS ROLLING MILL & SPIKE WORKS, 29th & Bristol Sts., Philadelphia, Pa.

Est. 1890.

Charles Gibbons Davis, Owner and Manager.

Rolling Mill and Spike Works, 29th & Bristol Sts., Phila.: blt. 1900, f. o. June, 1900; two 2-d. heat. fur.; 18" 3-h. 2-st.; 9" Belgian with 10" 3-h. 1-st. roughing, 9" 3-h. 5-st. finishing; 3 ham.; spike machines.

Product: spike rods for own use and concrete bars, annual cap., 10,000 tons. Railroad, ship and dock spikes, both standard and special design.

Davison-Namack Foundry Co., Ballston Spa., N. Y., see 1916 Direc-

tory, p. 118. Converter sold in 1916 to Fort Pitt Steel Casting Co. and manufacture of steel castings discontinued.

Dayton Coal & Iron Co. (The), W. B. Allen Receiver, Dayton, Tenn., see 1916 Directory, p. 119. Dayton Furnaces, Dayton, Tenn., were sold to H. S. Matthews of Rome, Ga., June, 1917, who turned them over to the Dayton Coal, Iron & Railway Co.

DAYTON COAL, IRON & RAILWAY CO., Dayton, Tenn.

Inc. Nov. 19, 1917 in Delaware. Capital stock: com. auth. \$3,000,000 issued \$1,811,911.67; pref. 8% cum. auth. \$2,000,000, issued \$2,000,000; bonds \$260,463.97.

H. S. Matthews, P.; J. M. Caldwell, Jr., M.; at Dayton. H. H. Melville, V. P.; W. F. Howell, Sec. & T.; at New York, N. Y.

Sales agent: J. M. Caldwell, Jr., Dayton, Tenn.

Dayton Furnaces, Dayton: 2 stacks: No. 1, 76' x 16'9", blt. 1884-5, rebt. 1904; No. 2, 80' x 18'3", blt. 1884-85, rebt. 1911; 8 stoves (one 2-pass 75' x 20', seven 4-pass 60' x 21'); 6 steam blowing eng.; flue boilers. Beehive coke; local red and brown hematite ore. Company owns 375 beehive coke ovens at Dayton, annual cap., 157,000 net tons coke; red ore mines known as Crescent Mines at Crescent, Tenn., and Nickerjack and Flintstone Mines, Walker Co., Georgia; limestone quarry at Dayton, Tenn., annual cap., 200,000 tons. (Formerly owned by the Dayton Coal & Iron Co.; acquired by Dayton Coal, Iron & Railway Co. in 1917).

Product: foundry pig iron, annual cap., 125,000 tons.

DAYTON MALLEABLE IRON CO. (The), Dayton, Ohio.

Inc. 1867 in Ohio. Capital stock: com. \$600,000; pref. 6% cum. \$400,000.

John C. Haswell, P. & G. M.; W. B. Runyan, V. P. & G. S.; H. D. Hunter, V. P. & G. S. M.; W. H. Cassel, Sec.; Adolph Heinz, T.; John McGregor, P. A.; at Dayton. M. F. Gartland, 1 V. P.; at Marion, Ind.

The company operates three plants, one at Ironton, Ohio, for malleable iron castings only, and two at Dayton for gray iron, malleable iron and steel castings.

Dayton Plant, Dayton, Ohio: one 2½-ton arc electric fur., f. o. Aug. 1, 1918.

Product: steel, malleable iron and gray iron castings; annual cap., 2,000 tons steel castings, 2,500 tons gray iron castings. Annual cap., of all plants, 40,000 tons of malleable iron castings.

DAYTON STEEL FOUNDRY CO. (The), Dayton, Ohio.

Inc. Sept. 30, 1909 in Ohio. Capital stock: com. auth. \$500,000, issued \$50,000; pref. 7% cum. auth. \$250,000, none issued.

George Walther, P.; G. E. Nicholas, V. P.; W. A. Pierce, Sec. & T.; Jacob Walther, G. M.; P. W. Klinger, G. S.; L. V. West, G. S. M.; J. A. Graham, P. A.

Selling agents:

Chicago, W. W. Pettis & Co., 975 Old Colony Bldg.
 Cincinnati, The W. W. Pettis Co., First Nat. Bank Bldg.
 Detroit, Edward H. Webb, 702 Penobscot Bldg.
 Pittsburgh, W. A. Young, 3 Buffalo St.

Works at Dayton, Ohio: blt. 1905, f. o. Nov., 1905; five 8-pot crucible fur. dismantled in 1916; one Bretaude converter (2-ton); 1 cupola; f. o. Aug. 24, 1911; 2 Snyder electric fur. (1 single-phase 1-ton and 1 three-phase 3-ton); f. o. Jan., 1916. Fuel, oil and coke.

Product: steel castings for sale; steel truck wheels, automobile, motor truck, tractor and machinery castings; annual cap., 2,000 tons converter, 6,300 tons electric steel castings.

DEEMER STEEL CASTING CO., New Castle, Delaware.

Inc. Aug. 5, 1907 in Delaware. Capital stock: com. auth. \$250,000, issued \$236,580.

S. S. Deemer, P. & G. M.; at New Castle. W. G. Parsons, Sc.; at 21st & Callowhill Sts., Philadelphia, Pa. Ezekiel Cooper, T.; at Wilmington, Del.

Works at New Castle: blt. 1909; 2 Deemer steel converters (3-ton); 2 cupolas; f. o. Jan. 17, 1910. Fuel, coal, coke and oil.

Product: railroad and machinery castings of every description for sale; alloy steel castings; annual cap., 3,000 tons.

Deforest Sheet and Tinplate Co. (The), Niles, Ohio, see 1916 Directory, p. 119; was sold to Republic Iron and Steel Co., May 9, 1919.

DELAWARE AND HUDSON CO. (The), Albany, N. Y.

J. H. Manning, S. Motive Power.

Works at Colonie: post office and telegraph address, Watervliet, N. Y.; blt. 1912-13; one 2-ton Whiting converter; installed 1912; f. o. Dec. 1, 1912; 1 cupola. Fuel, coke and oil.

Product: steel castings for own use; annual cap., 300 tons; gray iron castings, 2,000 tons; brass castings, 140 net tons.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD CO. (The), Scranton, Pa.

H. C. Manchester, S.

Keyser Valley Shops, Scranton: 1 double oil heat. fur.; 1 set of reclaiming rolls installed June, 1913; f. o. June 13, 1913. Fuel, oil.

Product: rounds and flats rolled from scrap for own use, annual cap., 800 tons.

DELAWARE RIVER STEEL CO., foot of Wilson St., Chester, Pa.

Inc. Nov. 9, 1909 in Pennsylvania. Capital stock: com. auth. \$500,000, issued \$488,500.

Charles Hart, P.; R. H. McCurdy, Sc. & T.; E. C. Wilson, A. Sc. & A. T.; B. J. Mullen, G. M.; at Chester. Myron A. Wick, V. P.; at Cleveland, Ohio.

Brand: "Delaware."

Delaware Furnace, Chester: 1 stack, 70' x 16' 6"; f. o. Nov., 1881; rebt. 1892, relined 1918; 1 McClure stove, 80' x 20', 3 Foote stoves, 65' x 16' 6"; 2 steam blowing eng. (30,000 cfm.); 1 turbo-blower (20,000 cfm.) in reserve; 8 water-tube boilers (2,400 H. P.); 1 Heyl & Patterson single-strand pig casting machine; 1 slag granulating pit, annual cap., 37,500 tons. By-product coke: foreign and Lake ores, pyrites sinter and pyrites nodules. Adjoining the furnace are 40 Semet-Solvay by-product coke ovens operated by Philadelphia Suburban Gas & Electric Co., annual cap., 95,000 tons.

Product: low-phosphorus, bessemer, malleable, foundry and basic pig iron; annual cap., 70,000 tons.

DELAWARE SEAMLESS TUBE CO., Auburn, Pa.

Inc. Jan. 15, 1903 in Delaware. Capital stock: com. \$150,000.

L. M. Driscoll, P.; J. R. Morrison, Sc.; S. B. Vernon, T.

Selling agent: I. D. Rockwell, 2 Rector St., New York and Book Bldg., Detroit.

Works at Auburn: rolling mill added 1897; rebt. 1902; f. o. Jan. 1, 1903; two 3-d. coal-fired heat. fur.; 10" 3-h. 2-st. billet, 14" 2-h. 2-st. tube mills; 2 steam ham. (150-lb.). Fuel, anth. and bit. coal.

Product: cold drawn seamless steel boiler tubes, superheater tubes and mechanical tubes; annual cap., 5,000 tons.

Delaware Steel and Ordnance Co., New York, N. Y. See 1916 Directory, p. 121. Temple Furnace at Temple, Pa., sold to Seaboard Steel & Manganese Corp., June 1, 1916. Old Ferry Mill, Wilmington, Del., was sold to the Wilmington Steel Co., a subsidiary of the Midvale Steel & Ordnance Co., May 12, 1916. The Wilmington Steel Co., was subsequently merged in the Midvale Steel & Ordnance Co.

Dempsey (M. J.), 40th St. & 11th Ave., New York, N. Y.

Standard Rolling Mill: blt. 1891; 2 coal heat. fur. (3-d.); 18" 3-h. 2-st. and 10" 3-h. 4-st. bar mills. Long idle.

Product: merchant bars, angles and horseshoe iron, annual cap., 6,000 tons.

DENVER ROCK DRILL MFG. Co. (The), 18th & Blake Sts., Denver, Col.

Inc. April 1, 1913 in Delaware. Capital stock: com. auth. \$1,000,000, issued \$800,000; pref. 7% cum. auth. \$750,000 outstanding \$200,400.

W. H. Leonard, P.; Bulkeley Wells, V. P.; A. H. Skaer, 2 V. P. & Works M.; H. E. Fiske, T. & A.; G. R. Grieve, A. Sc.; A. M. Adams, P. A.; at Denver. D. E. Strout, Sc.; at 30 Church St., New York.

Works at 39th & Gilpin Sts., Denver: blt. 1910; 1 Snyder 3-phase

electric fur. (1,200-lb.); electric steel first made May 31, 1919; semi-steel and brass castings for own use.

Product: steel castings primarily for own use in manufacture of rock drilling machinery; chrome and nickel alloy steel castings; annual cap., 500 tons.

DE SOTO FOUNDRY & MACHINE CO., Ltd., Mansfield, La.

Inc. 1906 in Louisiana. Capital stock: com. auth. \$75,000, issued \$72,300.

Charles R. Law, P., G. M., G. S. M. & P. A.; Benjamin Johnson, V. P.; R. W. Derrick, Sc., T. & A.

Works at Mansfield: blt. 1906; 1 Tropenas converter (2,000-lb.) added 1910; f. o. Sept. 1, 1910; 2 cupolas; one 1,500-lb. ham. Fuel, nat. gas and electricity. Gray iron foundry.

Product: steel castings for sale for gears, saw mill machinery, etc., annual cap., 1,500 tons; gray iron and semi-steel castings, 600 tons; and heavy forgings.

Detroit Furnace Co., Detroit, Mich., see 1916 Directory, p. 122, blast furnace plant at Detroit sold March 5, 1920 to United States Rubber Co. Blast furnace now in process of demolition.

DETROIT IRON & STEEL CO., Detroit, Mich.

Inc. April, 1902 in Michigan. Capital stock: com. \$1,500,000; pref. 7% cum. \$750,000; bonds \$240,000.

H. M. Hanna, Jr., P.; F. B. Richards, 1 V. P.; M. Andrews, 2 V. P.; R. F. Grant, Sc.; C. N. Osborne, T.; P. J. Moran, G. M.; C. K. Sheridan, P. A.; at Cleveland. W. S. Withycombe, A. Sc. & A. T.; A. P. McClure, G. S.; at Detroit.

Sales agents: M. A. Hanna & Co., 1300 Leader News Bldg., Cleveland, Ohio.

Brand: "Zug."

Furnaces on Zug Island, River Rouge, Wayne Co., Mich.: 2 thin-lined stacks; Furnace A, 78' x 19'; blt. 1903; f. o. Feb. 15, 1904; rebt. thin-lined, 1911; relined 1919. Furnace B, 80' x 20'; blt. 1909-10, f. o. July 20, 1910; rebt. thin-lined, 1914; eight 2-pass stoves, 83' x 20'; 5 steam blowing eng. (85,725 cfm.) and 1 turbo-blower (33,000 cfm.); 15 water-tube boilers (4,800 H. P.); 1 double-strand Uehling pig casting machine; 1 Greenawalt sintering plant for flue dust, annual cap., 15,000 tons. By-product coke: Lake ore.

Product: foundry, malleable and basic pig iron, annual cap., 220,000 to 240,000 tons.

DETROIT SEAMLESS STEEL TUBES CO., 841 Jefferson Ave., West, Detroit, Mich.

Inc. May 7, 1900 in Michigan. Capital stock: com. auth. \$1,000,000, issued \$300,000; pref. 7% cum. \$1,000,000.

A. A. Templeton, P. & G. M.; J. R. Coulter, V. P.; R. H. Phillips,

Sc. & T.; C. L. Stafford, G. S.; C. C. Rosser, G. S. M.; S. J. Cameron, P. A.

Selling agents: A. M. Castle & Co., Chicago, Ill. and Handlan Buck Mfg. Co., St. Louis, Mo. for boiler tubes; Steel Sales Corporation, Chicago, Ill., for mechanical tubes.

Works at 841 Jefferson Ave. West: blt. 1900; f. o. Jan. 1, 1901; 3 heat fur. (two 1-d., one 2-d.); 4 annealing fur.; 1 heat treating fur.; 5 pointing, 2 upsetting, 1 piercing machine; 3 trains (20" 2-h. 1-st., 19" 2-h. 1-st., 18" 2-h. 1-st.); 11 wooden pickling tanks. Fuel, coal, coke and oil.

Product: blanks for seamless steel tubes; cold drawn seamless steel tubes; locomotive tubes, boiler tubes, automobile and mechanical tubing; annual cap., 13,000 tons blanks, 9,000 tons cold drawn tubes.

New Works, Warren Ave. West & Wyoming Ave., Detroit: construction begun June, 1919, to be ready for operation in May, 1920; will be equipped to manufacture hot rolled and cold drawn seamless steel tubes, annual cap., about 35,000 tons rolled blanks and 25,000 tons finished tubes.

DETROIT STEEL CASTING CO. (The), 1243 Michigan Ave., Detroit, Michigan.

Inc. 1902 in Michigan. Capital stock: com. \$300,000; pref. 7% cum. \$300,000.

J. S. Newberry, P.; S. W. Utley, V. P. & G. M.; W. S. Allen, Sc. & G. S. M.; J. P. Warren, T.; E. W. Pike, G. S.; G. O. Smith, P. A.

Selling agents: H. V. Fleck & Co., Minneapolis; P. J. Ryan, 30 Church St., New York.

Works at Detroit: blt. 1889; rebt. after fire 1905; 2 A. O. H. fur. (20-ton); first O. H. steel made Oct. 13, 1905; 2 gas prod.; 2 annealing fur.; 2 side-blown converters (1-ton), f. o. Jan. 5, 1914; 1 cupola. Fuel, coke, prod. gas and oil.

Product: steel castings for sale for locomotives, cars, engines, heavy machinery, shipbuilding machinery, automobiles, trucks and tractors; nickel, chrome, vanadium and titanium alloy steel castings; annual cap., 3,600 tons converter, 12,000 tons open hearth castings.

DIBERT, BANCROFT & ROSS CO., Ltd., New Orleans, La.

Works at St. Joseph & Tchoupitoulas Sts., and at Tulane & Hagan Aves., New Orleans: two 2-ton Tropenas converters; f. o. Aug., 1907; 3 cupolas. Gray iron (6,000 tons) and brass (75 tons) foundry. Product: steel castings for sale, annual cap., 1,500 tons.

DILLON CRUCIBLE ALLOYS, Ltd., Welland, Ontario, Canada.

Inc. May 2, 1918 in Dominion of Canada. Capital stock: com. \$500,000; pref. 8% cum. auth. \$500,000, issued \$400,000.

T. J. Dillon, P. & G. M.; E. Darte, V. P.; F. C. Hesch, Sc. & T., F. J. McDonough, G. S.; at Welland. A. G. Woodhouse, G. S. M.; at Montreal.

Sales offices: Montreal, A. G. Woodhouse, 344 St. James St.; Toronto, Norman Nicholls, 220 King St. West.

Works at Welland, Ont.: blt. 1918, f. o. Jan., 1919; one 30-pot crucible fur.; 10" 3-h. 5-st. bar mill; 5 hammers (600-lb. to 4,000-lb.)

Product: steel ingots, nickel, chrome and tungsten alloy steel ingots; carbon and high speed tool steel; forged discs, die blocks and spindles. Annual cap., 2,120 tons ingots, 1,100 tons rolled products, 1,000 net tons forged products.

DILWORTH, PORTER & CO., Inc., 4th & Bingham Sts., South Side, Pittsburgh, Pa.

Inc. Aug. 21, 1916 in Pennsylvania. Capital stock: com. \$2,000,000.

J. R. Dilworth, Ch.; at 43 E. 53d St., New York. F. C. Stoeltzing, P. & T.; W. F. Schleiter, V. P., Sc. & G. S. M.; John C. Dilworth, Mill M.; Peter A. Froelich, Mill S.; G. M. Pott, P. A.; at Pittsburgh.

Selling agents:

Atlanta, Ga., V. A. Moore & Co., Healey Bldg.

Boston, Mass., F. C. Stowell, 200 Devonshire St.

Chicago, Ill., C. Stein, 6812 Cornell Ave.

Cleveland, O., Hamill-Hickox Co., Hickox Bldg.

Cincinnati, O., J. C. Kirby Co., Union Trust Bldg.

Detroit, Mich., Henry A. Wight, Ford Bldg.

Dallas, Tex., W. D. Jenkins, Praetorian Bldg.

Louisville, Ky., T. C. Coleman, Starks Bldg.

Richmond, Va., J. S. Hoffercker, Mutual Bldg.

St. Louis, Mo., Jos. G. Miller, Commonwealth Trust Bldg.

St. Paul, Minn., H. C. McNair Co., Endicott Bldg.

San Francisco, Cal., Latham McMullin, Claus Spreckels Bldg.

Glendon Rolling Mill, Pittsburgh: blt. 1857; rebld. after fire, 1902; 26 heat. fur. (twenty 2-d. rod and 6 cont. billet and slab); 18" 3-h. 3-st. and 18" 3-h. 2-st. bar mills; three 10" 2-h. 10-st. continuous; 22 automatic, 16 hand, spike machines. Fuel, nat. gas and powd. coal. Spikes, $2\frac{1}{2}" \times \frac{3}{8}"$ to $6\frac{1}{2}" \times \frac{5}{8}"$.

Product: railway, street railway and boat spikes and tie plates; annual cap., 51,200 tons spike rods, 70,000 tons tie plate bars, 512,000 kegs railway and boat spikes.

DISSTON (HENRY) & SONS, Inc., Tacony, Philadelphia, Pa.

Inc. Dec., 1886 in Pennsylvania. Capital stock: \$3,500,000.

Frank Disston, P. & T.; Henry Disston, 1 V. P.; Edmond B. Roberts, 2 V. P. & Sc.; William D. Disston, 3 V. P.; S. Horace Disston, 4 V. P.; Hamilton Disston, 5 V. P.; William Bumm, P. A.

Sales offices: Boston, Mass.; Chicago, Ill.; Cincinnati, Ohio; Memphis, Tenn.; New Orleans, La.; New York City; Portland, Ore.; San Francisco, Cal.; Seattle, Wash.; Sydney, N. S. W.; Toronto, Ont., and Vancouver, B. C., Canada.

Works at Tacony, Philadelphia: manufacture circular, cross cut, hand and other varieties of saws, and make saw fitting tools,

plumbs, levels, bevels, squares, brick and plastering trowels, etc. Annual cap., 500,000 cross cut saws, 100,000 circular saws from 6" dia. and 47,000 band saws. It also acts as selling agent for Henry Disston & Sons Iron and Steel Works and Henry Disston & Sons File Co.

Henry Disston and Sons File Co., Tacony, Philadelphia, Pa.

Org. 1877; inc. July 1, 1903. Capital stock: \$600,000.

Same officers as Henry Disston & Sons, Inc.

Works at Tacony, Philadelphia: manufacture files of all sizes, shapes and kinds of cut.

Henry Disston & Sons Iron & Steel Works, Tacony, Philadelphia, Pa.

Inc. Dec., 1886 in Pennsylvania. Capital stock: com. \$1,500,000.

Same officers as Henry Disston & Sons, Inc.

Selling agents: Henry Disston & Sons, Inc. (see above) and Charles G. Stevens Co., Jefferson and Monroe Sts., Chicago.

Brands: "Disston" and "Keystone."

Keystone Works, Tacony, Philadelphia: manufacture of saws started 1840 and steel 1854: 7 crucible fur. (three 24-pot, three 30-pot, and one 36-pot); 1 Heroult electric fur. (3-ton); rolling mill added 1866; 25 heat. fur. (sixteen 1-d., four 2-d., 3 cont., and 2 oil fur.); 6 gas producers; 18" 3-h. 5-st. bar, 12" 3-h. 7-st. bar, 9" 3-h. 5-st. guide, 9" 3-h. 7-st. guide mill; 2-h. 3-st. sheared plate mill with stands 28" x 84", 24" x 60" and 24" x 50"; 20" and 18" 2-h. 3-st. sheet, 18" and 16" 2-h. 3-st. sheet, 20" 2-h. 2-st. sheet, 16" 2-h. 3-st. sheet; 20" 2-st., 10" 5-st., 8" 10-st. cold mills; 8 box annealing fur.; 1 Mesta pickling machine; 6 hand pickling tanks; 5 ham. (750-lb. to 4,500-lb.). Fuel, coal oil and prod. gas.

Product: saw steel plates, tool steel sheets, carbon and alloy tool steel bars and special shapes, high speed steel, cold rolled bands, flat wire, etc.; annual cap., 15,800 tons ingots (13,000 crucible, 2,800 electric); 5,000 tons plates, 10,000 tons sheets; 20,000 tons rolled bars, bands and rods, 1,000 tons hammered products.

DODGE STEEL CO., Morris Bldg., Philadelphia, Pa.

Inc. Aug. 6, 1919 in Pennsylvania. Capital stock: com. auth. \$200,000; pref. 7% cum. auth. \$100,000.

Kern Dodge, P. & T.; C. S. Bell, Sc.; at Morris Bldg., Phila. Karl Dodge, 1 V. P.; Henry B. Allen, 2 V. P.; Homer J. Brown, P. A.; at Tacony.

Works at State Road & Hellerman St., Tacony, Phila.: construction begun Aug. 1, 1919; one 3-ton three phase arc electric fur., first steel castings made March 12, 1920.

Product: small electric steel castings, annual cap., 2,000 tons.

DOMINION FOUNDRIES & STEEL, Ltd., Hamilton, Ont.

Inc. May, 1917 in Dominion of Canada. Capital stock: com. auth. \$5,000,000, issued \$3,000,000; pref. 8% cum. auth. \$1,000,000; issued \$720,000.

C. W. Sherman, P.; A. G. Wright, Sc. & T.; F. A. Sherman, G. M.; G. H. Gordon, G. S. M.; F. W. Sherman, P. A.; at Hamilton. W. J. Verity, V. P.; at Brantford, Ont.

Sales office: Toronto, W. G. Grant, 709 C. P. R. Bldg.

Works at Hamilton: blt. 1912; 2-ton Stock converter (abandoned 1914); 2 B. O. H. fur. (35-ton); 7 A. O. H. (two 20-ton, five 25-ton); 2 Heroult electric fur. (6-ton); first converter steel made Feb. 15, 1913; first O. H. steel made Nov. 19, 1912; rolling mill blt. 1916; 11 heat. fur. oil-fired (one 1-d., three 2-d., four 3-d., one 5-d., and 2 cont.); 22" 3-h. 2-st. bar mill; 26" x 36" 2-h. jobbing plate mill; 1 box annealing fur.; 1 hand pickling tank; 1 ham. (1,500-lb.); 3 forging presses (two 500-ton and one 1,000-ton). Fuel, oil. (Formerly known as Dominion Steel Foundry Co., Ltd.; merged with the Hamilton Steel Wheel Co., Ltd., to form the Dominion Foundries & Steel, Ltd., July 1, 1918).

Product: steel ingots; chrome, nickel and vanadium alloy steel ingot and castings; steel castings for sale and own use; locomotive and car castings; blooms and billets, bridge, car, agricultural and automobile plates and sheets; and forged products; annual cap., 132,000 tons ingots (42,000 tons basic, 80,000 tons acid, 12,000 tons electric), 35,000 tons steel castings (5,000 tons basic, 20,000 tons acid, 10,000 tons electric), 30,000 tons billets, 10,000 tons plates, 10,000 tons forged car axles, 3,500 tons forged shafting, 6,000 tons agricultural shapes for plows, harrows, etc.

DOMINION IRON AND STEEL CO., Ltd., Sydney, Nova Scotia, Canada.

Inc. 1899. Capital stock: com. auth. \$25,000,000, issued \$20,800,000; pref. 7% cum. auth. and issued \$5,000,000; bonds \$13,641,526 mortgage, \$3,500,000 income.

Roy M. Wolvin, P.; at 112 St. James St., Montreal. William McMaster, V. P.; at Montreal. C. S. Cameron, Sc., T. & C.; H. E. Rice, G. S.; J. P. McNaughton, G. S. M.; H. J. McCann, P. A.; at Sydney.

Sales offices: Montreal, 112 St. James St.; London, England, 90 Fenchurch St.

Brands: "Disc," "Dominion."

Works at Sydney, Nova Scotia: Blast Furnaces: 6 stacks (one 89' x 22', five 85' x 20'); construction commenced 1899; No. 1, f. o. Feb. 4, 1901, rebt. 1918; No. 2, May 9, 1901; No. 3, Oct. 21, 1901; No. 4, Jan. 18, 1902; No. 7, May 22, 1913; and No. 8, Sept. 15, 1912; 24 Cowper-Kennedy stoves (four 95' x 21', twenty 85' x 21'); 7 steam blowing eng. (5 cross compound, 2 turbo-blowers), 245,000 cfm.; 44 water-tube boilers, 12,400 H. P.; 1 double Heyl and Patterson casting machine. By-product coke: Wabana ore. Molten metal to mixers and to O. H. furnaces direct. Product: basic and foundry pig iron, annual cap., 550,000 tons.

Rolling Mills: org. blt. 1900-01; five 4-hole soaking pits; 1 cont.

ingot heat. fur.; 12 B. O. H. fur. (ten 50-ton, two 100-ton), f. o. Dec. 31, 1901; 3 (1 for spare) basic Bessemer converters, added 1907, f. o. May, 1907, used only for desiliconizing, dephosphorizing and decarburizing molten metal for O. H. fur.; one 300-ton mixer; 35" 2-h. 1-st. reversing blooming mill, first blooms rolled Feb., 1902; 16" 2-h. 6-st. Morgan cont. billet mill, first billets rolled May, 1904; 12" 2-h. 6-st. roughing and 10" 2-h. 8-st. finishing, Morgan cont. rod mill, first rods rolled May, 1904; Morgan semi-cont. bar and rod mill with 12" 2-h. 6-st. roughing and 3 trains of 2 stands each 10½" and 9½" finishing, first bars rolled Mar., 1913; 28" rail mill consisting of 3-h. roughing, 3-h. intermediate, and 2-h. finishing, first rails rolled July, 1905; 16" merchant, with 3-h. roughing, 3-h. intermediate, and 2-h. finishing, first bars rolled Sept., 1915; 110" sheared plate mill. Gray iron foundry, annual cap., 5,000 tons; brass foundry and machine shop for own use. Fuel, prod. gas, coke oven gas, bit. coal, and tar. Product: open hearth steel ingots; blooms, billets, slabs; steel rails, bars, angles, channels, I beams, flats, squares, rounds, angle bars, sheared plates and wire rods. Annual cap., 400,000 tons ingots; 375,000 tons blooms, billets and slabs; 300,000 tons rails, 120,000 tons sheared plates; 90,000 tons wire rods, 75,000 tons bars. Wire and Nail Department: added 1911-12, f. o. May, 1912; 3 double frames of twenty-four 26" blocks each, 1 single frame of eleven 26" blocks; 1 single frame of twenty-four 16" and 20" blocks; 4 single frames of twelve 8" blocks each; 91 nail machines; 2 staple machines, 50 barbed wire machines; pot annealing and galvanizing department; cooperage shop. Product: nails, all styles and sizes, plain, polished, blued and hot galvanized; wire from ½" to 22 gage, galvanized, black or pot annealed; barbed wire; staples, black or galvanized; wire hoops, etc. Annual cap., 60,000 tons drawn wire, 25,000 tons wire nails.

Company owns Wabana iron ore mines on Bell Island, Conception Bay, Newfoundland, with an annual cap. of 850,000 tons.

By-product coke plant at Sydney, consisting of 120 Otto-Hoffman by-product ovens with an annual cap. of 200,000 net tons of coke; 120 Koppers by-product ovens added during 1918-19 with an annual cap. of 425,000 net tons. Coal washing plant. By-product recovery plant. Benzol plant to handle gas from 2,000 tons coal daily; product, benzol, toluol, naphtha, and naphthaline. Also plant operated by the Dominion Tar & Chemical Co. for the manufacture of creosote and other oils, carboic acid and pitch.

The company owns limestone quarries as follows: Marble Mountain quarry at Marble Mountain, Inverness Co., Nova Scotia, annual cap., 300,000 tons; Port au Port quarry at Aguathunia, Port au Port Bay, Newfoundland, annual cap., 300,000 tons; Georges River quarry at Georges River, Cape Breton Co., Nova Scotia, annual cap., 30,000 tons. Total annual cap., 630,000 tons limestone.

Dominion Steel Foundry Co., Ltd., Hamilton, Ont., Canada. See 1916 Directory, p. 127, was acquired by Dominion Foundries and Steel, Ltd., July 1, 1918.

DONNER STEEL CO., Inc., 475 Abbott Road, Buffalo, N. Y.

Inc. Dec. 9, 1915 in New York. Capital stock: com. auth. \$5,000,000, issued \$4,522,500; pref. 7% cum. \$6,000,000; 8% cum. \$3,000,000; bonds \$2,729,000.

William H. Donner, P.; Floyd K. Smith, V. P. & T.; Robert Donner, V. P.; W. B. Enck, V. P.; W. W. Hancock, Sc.; F. R. Huston, A.; A. W. Courtney, G. S.; W. F. Vosmer, G. S. M.; John K. Frye, P. A.

Sales offices:

Buffalo, W. F. Vosmer, 475 Abbott Road.

Chicago, McCormick Bldg.

Cleveland, Union Commerce National Bank Bldg.

Dallas, Tex., Great Southern Life Bldg.

Detroit, Book Bldg.

Milwaukee, L. E. Meidinger, First National Bank Building.

New York, P. M. Guba, 120 Broadway.

Philadelphia, H. G. Uphouse, 1607 Morris Bldg.

Portland, Ore., Dekum Bldg.

San Francisco, A. W. Dow, Call Bldg.

Seattle, L. C. Smith Bldg.

Pig iron brands: "Donner," "Niagara," "Tonawanda."

Tonawanda Furnaces, North Tonawanda, N. Y.: 2 stacks: A, 78' x 18', blt. 1873, last rebt. 1918; B, 80' x 18', blt. 1895, f. o. Nov. 5, 1896, relined 1917; 8 hot blast stoves, 80' x 18' (3 side-combustion, 5 center-combustion); 5 steam blowing eng. (80,000 cfm.); 8 water-tube boilers, 4,000 H. P.; 1 double-strand pig casting machine. Coke: Lake ore. (Owned by Tonawanda Iron & Steel Co.; leased by Donner Steel Co., Oct., 1916 with option to purchase). Product: foundry and malleable pig iron; annual cap., 180,000 tons.

Buffalo Works, 475 Abbott Road, Buffalo: Blast Furnaces: 2 stacks; No. 1, 90' 3" x 22'; blt. 1916-17; f. o. Aug. 23, 1917; No. 2 (formerly Nellie B.), 85' x 21'; blt. 1906-09; f. o. July 14, 1909; rebt. 1918; 8 center-combustion stoves (four 121' 6" x 21', four 114' x 21'); 4 steam blowing eng. (200,000 cfm.); 10 water-tube boilers, 4,000 H. P. for blast furnaces; 10 water-tube boilers, 5,500 H. P. (waste heat from O. H.) for general service; 1 single-strand Heyl & Patterson pig casting machine; 1 slag granulating pit, annual cap., 56,000 tons. Coke; Lake ore. Product: basic pig iron, annual cap., 360,000 tons.

Steel Works: blt. 1905-07; 10 B. O. H. fur. (three 100-ton, seven 85-ton); f. o. April 18, 1907; 2 metal mixers (600-ton); five 4-hole soaking pits; 6 cont. heat. fur. (3 slab, 3 billet); 15 gas producers; 36" 2-h. 1-st. blooming; 18" 2-h. 8-st. Morgan cont. billet; 14" cross country bar mill with 18" 2-h. 2-st. roughing and 14" 2-h. 2-st.

finishing, 14" 3-h. 3-st. finishing; 10" continuous bar mill, 14" 2-h. 4-st. roughing, 10" 2-h. 4-st. finishing and 10" 3-h. 2-st. finishing; 8" comb. bar mill with 10" 2-h. 7-st. roughing and 8" 3-h. 4-st. and 8" 2-h. 2-st. finishing; 30" x 84" 3-h. sheared plate mill. Fuel, prod. gas. Product: blooms, billets and slabs; ship, tank, boiler and bridge plates; bars, small structural shapes, and special sections; annual cap., ingots 425,000 tons, slabs 133,000 tons, blooms and billets 235,000 tons, sheared plates 100,000 tons, merchant bars and shapes 180,000 tons.

COAL, COKE AND ORE PROPERTIES.

The Donner Steel Co. owns the Hastings Coal & Coke Co., consisting of 140 acres of coal in fee, 420 acres under lease, 40 acres of surface and 50 mechanically drawn coke ovens; also one-half interest in the Donner-Union Coke Corp., which owns a tract of land adjacent to its Buffalo Works, having under construction 150 Koppers by-product coke ovens; also the Donner Mining Co., which owns an ore lease on the Mesabi Range known as the Alexandria Mine, which it operates; also a controlling interest in the Donner Steamship Co., which owns the steamer "Herbert F. Black."

DOVER IRON CO., Carlisle, Tenn.

Inc. 1901 in Tennessee. Capital stock: com. \$40,000.

Graham Macfarlane, P.; Graham Macfarlane, Jr., T. & G. M.; at Clarksville, Tenn. R. B. Hickman, Sc.; at Louisville, Ky.

Sales agent: Hickman, Williams & Co., Oliver Bldg., Pittsburgh and McCormick Bldg., Chicago. Brand: "Dover."

Dover Furnace at Carlisle, Tenn.: 1 stack, 36' x 9'6", blt. 1828, last rebt. 1903-04; relined 1919; cold blast; 1 steam blowing eng.; 3 cylindrical boilers, 100 H. P. Charcoal; local brown hematite ore. Company owns iron ore mines at Bear Spring, Tenn., annual cap., 10,000 tons; limestone quarry at furnace.

Product: cold blast charcoal pig iron for chilled rolls; annual cap., 4,800 tons.

Downey-Wilford-Shields Co., Indianapolis, Ind., see Hercules Forge Co., and Imperial Drop Forge Co.

DRAIN STEEL CO. (The), Moore, Pa.

Inc. Sept. 5, 1919 in Pennsylvania. Capital stock: com. \$750,000.

John A. Drain, P.; at Philadelphia, Pa. George Sutherland, Sc. & T.; at Moore.

Works at Moore: construction begun Sept. 15, 1919, put in operation April 13, 1920; two 65-ton B. O. H. fur.

Product: steel ingots, alloy steel ingots, annual cap., 50,000 tons.

DRISCOLL-REESE STEEL CO., Hamburg, Pa.

Inc. May 14, 1918 in Pennsylvania. Capital stock: com. \$100,000.

L. M. Driscoll, P.; C. D. Reese, V. P.; P. P. Reese, T.; Joseph E. Pool, G. M.

Works at Hamburg, Pa.: blt. 1917; f. o. May, 1918; 1 Heroult electric fur. (1-ton).

Product: small steel castings for sale; automobile castings; annual cap., 900 tons.

DRIVER-HARRIS CO., Harrison, New Jersey.

Inc. Dec., 1899 in New Jersey. Capital stock: com. \$1,000,000; pref. 7% cum. \$284,500.

F. L. Driver, P.; A. Bense, 1 V. P.; L. O. Hart, 2 V. P. & G. S.; F. L. Driver, Jr., 3 V. P.; M. C. Harris, Sc.; P. E. Reeves, T.; J. A. Delves, G. S. M.; E. A. Harleman, P. A.

Sales offices: Harrison, N. J., 28 South Jefferson St., Chicago and Free Press Bldg., Detroit.

Works at Harrison, N. J.: 15 crucible fur. (5-pot); 2 Heroult electric fur. (2-ton); one 300-lb. Rennerfelt electric fur.; electric steel first made, April 15, 1918.

Product: nickel, nickel-copper and nickel-chromium alloy steel ingots for own use; annual cap., 1,750 tons (1,500 tons electric, 250 tons crucible.) Make also cold rolled strip steel, wire rope, non-ferrous metal wires and sheet nickel.

DROLET (F. X.), La COMPAGNIE, 206 Bridge St., Quebec, P. Q., Canada.

Capital stock: com. \$199,000.

F. X. Drolet, P. & G. M.; G. Drolet, V. P.; J. H. Hamel, Sc.; Arthur Drolet, T.

Works at 206 Bridge St., Quebec: 1 Baillot converter (1-ton); 2 cupolas. Fuel, coal and oil.

Product: steel castings for sale from 1-lb. to 10-tons; gray iron and brass castings; annual cap., 2,000 tons of steel, 2,500 tons gray iron and 100 tons of brass castings.

Duplex Metals Co., Chester, Pa., see 1916 Directory, p. 129. Works at Chester sold in August, 1916, to Chester Shipbuilding Co. and rolling mill completely dismantled.

DUQUESNE STEEL FOUNDRY CO., Farmers Bank Bldg., Pittsburgh, Pa.

Inc. Dec. 13, 1899 in Pennsylvania. Capital stock: com. auth. \$1,200,000, issued \$750,000.

D. C. Bakewell, P.; W. E. Hoblitzelle, V. P.; R. A. Bull, V. P. & G. M.; E. W. Gwinner, Sc.; E. S. Eggers, T.; Malcom Maclean G. S. M.; R. P. Bakewell, A. G. S. M.; at Pittsburgh. C. F. Powell, A.; E. R. Swanson, G. S.; M. P. Emmerich, P. A.; at Coraopolis, Pa.

Works at Kendall Station, P. & L. E. R. R. (post office and telegraph address, Coraopolis, Pa.): 3 A. O. H. fur. (25-ton). Fuel, nat. gas.

Product: steel castings for sale, for rolls, rolling mills, locomotives and cars, electric motors, etc.; annual cap., 25,000 tons.

EAGAN-ROGERS STEEL & IRON CO., Crum Lynne, Pa.

Inc. Feb. 26, 1912 in Pennsylvania. Capital stock: com. \$111,300. Daniel C. Eagan, P. & G. M.; M. A. Casey, Sc. & P. A.; John I. Rogers, T. & G. S. M.; at Crum Lynne. John J. Buckley, V. P.; at Chester, Pa.

Works at Crum Lynne: blt. 1912; f. o. July 29, 1912; 1 Stoughton converter (2-ton).

Product: steel castings, 1 to 4,000-lb.; nickel, chrome and vanadium alloy steel castings; castings for naval construction, locomotives and automobile trucks; annual cap., 2,500 tons.

EAGLE FURNACE CO., Chattanooga, Tenn.

Inc. Dec., 1909.

Charles A. Lyerly, P. & T.; Frederick Gidding, Sc.

Brand: "Attalla."

Attalla Furnace, Attalla, Ala.: 1 stack, 55' x 11'; blt. 1888-9; f. o. June 15, 1889; iron stoves; 1 steam blowing eng.; 2 flue boilers, 80 H. P.; red and brown hematite ores from Etowah and Cherokee counties; 25 charcoal ovens with an annual cap. of 360,000 bushels. (Furnace leased by Gulf States Steel Co. in December, 1916; lease expired in April 1919.)

Product: car-wheel charcoal pig iron, annual cap., 12,000 tons.

EAGLE IRON CO., Curtin, Pa.

Org. and inc. 1899.

J. M. Curtin, P.; at Pittsburgh. H. Laird Curtin, V. P. & S.; John Curtin, T.; at Curtin.

Selling agents: Rogers, Brown & Co.

Eagle Furnace, Curtin (leased, owned by H. L. Curtin): 1 stack; 29' x 8½'; blt. 1848; cold blast; 1 Houston blowing eng. (1,000 cfm.); open top, open hearth, and closed tuyere; water power. Charcoal: Nittany Valley ore from company's mines near Bellefonte, annual cap., 2,000 tons.

Product: charcoal pig iron for rolls and dies, annual cap., 2,400 tons.

EAST END PUDDLE MILL (W. B. Godcharles, Owner), Milton, Pa.

Works at Milton: blt. 1875; reblt. 1899; 5 single and 9 double puddling fur.; 1 rotary squeezer; 20" 3-h. 1-st. muck mill; nail plate mill, cut nail and washer departments dismantled. Fuel, coal. (Formerly known as Milton Nail Works and owned by F. A. Godcharles Co.; acquired by W. B. Godcharles in 1917.)

Product: muck bar; annual cap., 15,000 tons.

EAST JORDAN FURNACE CO., East Jordan, Mich.

Inc. Nov. 24, 1909 in Michigan. Capital stock: com. \$225,000; pref. cum. \$150,000.

W. S. Shaw, P.; at 616 South Michigan Ave., Chicago, Ill. F. L. Howes, V. P.; at 321 Summer St., Boston, Mass. Walter Cook, Sc.; A. Cameron, T. & G. M.; at East Jordan.

Selling agents: Michigan Iron & Chemical Co., 1418 Consumers Bldg., Chicago.

Furnace at East Jordan: 1 stack; 60' x 10', blt. 1907-09; f. o. Jan. 17, 1910; 2 fire-brick stoves, 60' x 14'; 2 steam blowing eng. (10,950 cfm.); 6 water-tube boilers, 1,500 H. P.; 16 charcoal retorts, annual cap., 1,950,000 bushels. Charcoal: Lake ore.

Product: charcoal pig iron for car wheels, annual cap., 20,000 tons.

EASTERN ROLLING MILL CO., 503 Lexington Bldg., Baltimore, Md.

Inc. June 26, 1919 in Maryland. Capital stock: com. auth. 60,000 shares, no par value, issued 30,000 shares; pref. 8% cum. auth. \$5,000,000, issued \$3,000,000.

J. M. Jones, P. & G. M.; C. E. F. Clarke, V. P. & T.; L. J. Jones, Sc. & P. A.; J. A. Downey, A. T.; C. A. Pennock, G. S.; A. J. Hazlett, S. M.

Works at Sewer Road & Baltimore St., Colgate, Baltimore: under construction; to be completed about May, 1920; 12 sheet and 12 pair fur.; 8 hot black sheet mills (30" x 44" and 30" x 54"); 4 hot black plate (tin) mills (30" x 34"); 4 cold mills on hot mill trains, 2 trains of 2 stands each, 26" x 60"; 16 cold mills, 2 trains 8 stands each, 26" x 60"; 6 double box annealing fur. double length; 4 Mesta pickling mach. Fuel, coal.

Product: black sheets for automobiles and metallic furniture, enameling stock; annual cap., 60,000 tons.

EASTERN STEEL CO. (The), 458 Peacock St., Pottsville, Pa.

Inc. Jan. 8, 1903 in Pennsylvania. Capital stock: com. auth. \$4,700,000, issued \$4,000,000; pref. 7% cum. auth. \$4,700,000, issued \$2,200,000; bonds \$1,984,000.

James A. Burden, 1 V. P.; August Heckscher, 2 V. P.; Malcolm D. Sloane, Sc.; at 60 Broadway, New York. P. R. Foley, G. S. M.; at Pennsylvania Bldg., Philadelphia. Edward L. Herndon, T.; E. L. Hitchcock, A.; at Pottsville.

Sales offices:

Boston, H. O. Russ, 110 State St.

New York, C. F. Fay, 60 Broadway.

Philadelphia, F. W. Jones, Pennsylvania Bldg.

Brand: "Warwick" for pig iron.

Product: foundry, basic, mill, malleable, bessemer and low phosphorus pig iron; ingots, blooms, billets, beams, channels and angles; structural bolts and rivets.

Warwick Furnaces, Pottstown (leased; owned by Warwick Iron & Steel Co.): 3 stacks; Nos. 1, 2 & "A." No. 1, 70' x 16'; standing idle; blt. 1875; f. o. April, 1876; enl. 1889; No. 2, 100' x 21' 11"; blt. 1900-1; f. o. Oct. 8, 1901; rebt. 1917; "A," 85' x 18' 3" (thin-lined); blt. 1910; f. o. May 19, 1912; relined, 1915; 4 Roberts 2-pass stoves 100' x 22' and 4 McClure 3-pass stoves (three 80' x 20', one 70' x 20'); 3 steam blowing eng. (67,800 cfm.); 15 water-tube boilers, 4,350 H. P.; 3 Uehling pig casting machines (1 single and 2 double-strand); 1 Gayley sintering plant for pyrites, fine ores and flue dust, annual cap., 60,000 tons. Coke: Lake ores, magnetite and by-products. Iron foundry and machine shop for own use. Product: foundry, basic, mill, malleable, bessemer and low-phosphorus pig iron, annual cap., 300,000 tons.

Eastern Steel Co. Plant, Pottsville (owned): O. H. steel plant blt. 1890; rebt. 1902-04; f. o. July 22, 1905; 6 B. O. H. fur. (four 50-ton, two 80-ton); rolling mill blt. 1852; rebt. 1877; again rebt. 1902; four 1-hole soaking pits; 5 heat. fur. (3 cont. and 2 regenerative); 15 gas producers; 44" 2-h. 1-st. blooming, 28" 3-h. 4-st. structural, 19" 3-h. 3-st. and 12" 3-h. 3-st. merchant mills. Fuel, oil, coal and producer gas. Bridge works, annual cap., 15,000 tons. Dept. for structural bolts and rivets, 1/2" to 1" dia. Product and annual cap.: ingots (200,000 tons), blooms and billets (125,000 tons), structural shapes (180,000 to 200,000 tons), bolts (6,260 kegs), rivets (3,000 kegs).

EASTERN STEEL CASTING CO., 30 Kemble St., Boston, Mass.

Org. Aug., 1905, not incorporated.

John W. Johnson, Proprietor and Manager.

Works at 30 Kemble St., Boston: blt. 1910; three 8-pot crucible fur. Fuel, crude petroleum.

Product: crucible steel castings for sale; nickel and chrome alloy steel castings; annual cap., 600 tons.

Eburne Steel Co., Ltd., P. O. Box 246, Kerrisdale, B. C., Canada.

T. M. Taylor, assignee.

Pacific Steel Co., Ltd. was merged with Eburne Steel Co., Ltd., late in 1918. The latter company made an assignment for the benefit of its creditors, Jan. 4, 1919, naming T. M. Taylor as assignee. Plant acquired by Vancouver Rolling Mills Co., Ltd., in 1919.

ECKELS-NYE STEEL CO., Emerson Avenue, Syracuse, N. Y.

Inc. Mar. 30, 1899 in New York. Capital stock: com. \$60,000.

Peter Eckel, P.; Philip Eckel, V. P. & G. S.; Frank M. Sears, Sc., G. S. M. & P. A.; Frank Eckel, T.

Sales offices: Philadelphia, J. W. Moon, 1420 Chestnut St.; Syracuse, General office.

Works at Syracuse: blt. and f. o. 1899; two 4-d. Sweet heat. fur.; 13" 3-h. 4-st. rail-splitting and rerolling mill. Fuel, bit. coal.

Product: bessemer and high carbon merchant bars and light steel angles; annual cap., 12,000 tons.

EDDYSTONE STEEL CO., Crum Lynne, Pa.

Inc. April 11, 1916 in Pennsylvania. Capital stock: com. \$200,000. John E. Sullivan, P.; Newell C. Bradley, V. P.; John B. Mosbrook, Sc., T. & P. A.; David C. Adams, G. S.; at Crum Lynne. Works at Crum Lynne, Pa.: blt. 1887-8; rebld. 1901; one 15-ton B. O. H. fur.; installed Nov., 1916; f. o. Dec. 1, 1916; 5 heat. fur. (three 2-d., two 3-d.); 22" 2-h. 3-st. bar mill; two 24" x 60" 2-h. sheared plate mills; 1 steam ham. (3500-lb.). Charcoal forge dismantled. (Formerly owned by Hervey S. Walker; acquired by Eddystone Steel Co., June, 1917.)

Product and annual cap.: ingots (10,000 tons), billets (15,000 tons), sheared plates (20,000 tons), alloy and high carbon bars (10,000 tons).

EDGAR ZINC CO., Boatmen's Bank Bldg., St. Louis, Mo.

Subsidiary of the United States Steel Corporation.

A. S. McMillan, P.; John Davis, Sc. & T.; L. B. Schneider, A. Cherryvale Works, Cherryvale, Kansas: 4,984 retorts, annual cap., 26,000 net tons of spelter.

The company controls 4,815 acres of natural gas lands in Kansas with 69 gas wells.

EDGEWATER STEEL CO., Pittsburgh, Pa.

Inc. Oct. 1, 1916 in Pennsylvania. Capital stock: com. \$2,000,000; bonds \$750,000.

Frank B. Bell, P.; W. V. D. Wright, V. P.; J. H. Baily, Sc.; John Henderson, A.; F. C. Riddile, G. M.; M. A. Smith, A. G. M.; G. D. Leopold, P. A.; at Oakmont, Pa. M. R. Jackson, V. P.; at Philadelphia. W. H. Schoen, T.; at Pittsburgh.

Sales offices:

Boston, Sherburne & Co., 53 Oliver St.
Chicago, A. J. Couse, Jr., 1820 McCormick Bldg.
Louisville, M. S. Simpson, Starks Bldg.
Philadelphia, M. R. Jackson, 301 Finance Bldg.
St. Louis, H. J. Tierney, 2064 Railway Exchange Bldg.
St. Paul, Rank & Goodell, 906 Merchants Bank Bldg.
San Francisco, Hickok & Hickok, Hobart Bldg.
Washington, L. O. Cameron, Munsey Bldg.

Works at Oakmont, Pa.: bld. 1915; f. o. Dec. 1, 1915; 2 B. O. H. fur. (75 ton); 2 A. O. H. fur. (25-ton and 35-ton); 6 reheat. fur. (one 1-d., two 2-d., one 4-d., two cont.); one 4-hole soaking pit; 2 special mills for rolling steel wheels and locomotive tires with 2 hydraulic forging presses (3,000-ton, 6,000-ton); 2 hydraulic forging presses (1,000-ton, 1,200-ton) for general forgings. Fuel, coal, prod. gas and oil. (Formerly owned by Kennedy-Stroh Corporation; acquired by Edgewater Steel Co., Oct. 1, 1916).

Product: steel ingots and castings for own use and for sale; locomotive tires, rolled steel wheels, steel-tired wheels, rolled steel rings for mining and crushing machinery; forging ingots; die forgings; annular and disc forgings, gear blanks, pipe flanges, shafts and couplings. Annual cap., 85,000 tons ingots (65,000 tons basic, 20,000 tons acid); 9,600 tons acid open hearth castings; 12,000 tons forgings.

EDWARDS (E. T.), 666 Locust St., Columbia, Pa.

East End Mill, Columbia: blt. 1893-4; f. o. Sept., 1894; three 3-d. heat. fur.; 18" 2-h. 2-st. breakdown; 12" 3-h. 5-st. finishing. Fuel, bit. coal. (Formerly owned by Susquehanna Iron Co.; acquired by E. T. Edwards, April 1, 1920.) Product: merchant bar iron and steel; spike, chain, bolt, nut and rivet rods; annual cap., 12,000 tons merchant bars.

Union Street Mill, Columbia (owned): f. o. July 13, 1886; rebt. 1917 and put in operation Aug. 6, 1917; 16 double puddling fur.; 1 squeezer; 18" 3-h. 2-st. muck bar mill. (Formerly owned by Susquehanna Iron Co., long idle and abandoned; acquired by E. T. Edwards, Feb., 1917 and new machinery installed.) Fuel, bit. coal. Product: muck bar; annual cap., 15,000 tons.

Columbia Mill, Susquehanna Mill and Susquehanna Tube Mill at Columbia, formerly leased by E. T. Edwards, have been returned to the owner, see Susquehanna Iron Co., Lancaster, Pa.

Eichleay, J. P. & W. B. see Addenda, p. 397.

ELECTRIC ALLOY STEEL CO. (The), Youngstown, Ohio.

Inc. Dec. 24, 1919 in Ohio. Capital stock: com. \$1,500,000. L. J. Campbell, P. & T.; A. E. Adams, V. P.; L. A. Manchester, Sc. Plan to build plant in Trumbull County, Ohio, for manufacture of electric alloy steel ingots, rolled and hammered alloy tool steel.

Electric Smelting Co. (The) of Brantford, Hull, P. Q., Canada.

Plant at Hull, P. Q., Canada; electric fur. for making low-phosphorus pig iron from scrap; f. o. June, 1918. Operation ceased with termination of the war. Equipment to be sold and dismantled; company to be liquidated.

ELECTRIC STEEL AND FORGE CO., P. O. Box 38, Station D., Cleveland, Ohio.

Inc. 1918 in Delaware. Capital stock: com. auth. 20,000 shares; pref. 7% cum. auth. \$2,000,000.

J. H. Foster, P.; D. W. Wells, V. P. & G. M.; C. R. Cross, Sc.; A. B. Smythe, T.; C. A. Swan, G. S.; J. R. Watts, G. S. M.; R. V. Coburn, P. A.

Works at 6800 Grant Ave., Cleveland: blt. 1916-17; one 6-ton Heroult electric fur. added 1919; twelve 2-d. heat. fur.; 7 steam ham. (400-lb. to 6-ton); 1 forging press (500-ton). Fuel, coal.

(Formerly owned by Crucible Steel Forge Co.; acquired by Electric Steel & Forge Co., April 1, 1918.) Rolling Mill under construction to be completed about July 1, 1920; 13 heat. fur. (four 1-d., nine 2-d.); 16" 3-h. 2-st. and 16" 2-h. 2-st., 10" 3-h. 2-st. and 10" 2-h. 3-st., 8" 2-h. 2-st. bar mills; 4 box annealing fur.; 2 pickling tanks. Annual cap. 7,500 tons rolled products. Installing one $\frac{1}{2}$ -ton Heroult electric fur. and will add in summer of 1920 one 6-ton Heroult electric fur., increasing ingot cap. to 15,000 tons.

Product: steel ingots, forged products and special heat-treated forgings, hammered tool steel and special alloy bars; annual cap., ingots, 9,000 tons, forged and rolled products, 7,500 tons.

ELECTRIC STEEL AND METALS CO. (The), Ltd., P. O. Drawer 128, Welland, Ont., Canada.

Inc. May, 1913 in Ontario. Capital stock: com. auth. \$500,000, issued \$225,000.

R. W. Leonard, P.; at 50 Ontario St., St. Catharines, Ont. W. K. George, 1 V. P.; at 16 King St. East, Toronto, Ont. J. R. Roberts, Sc. & T.; G. C. MacKenzie, G. M.; W. B. McDonald, G. S.; E. P. Hamilton, G. S. M. & P. A.; at Welland.

Works at Welland, Ontario: blt. 1913-14; two 6-ton Heroult electric fur.; first steel made Dec. 1, 1914. Fuel, electricity, coal and gas.

Product: steel ingots and castings for sale; manganese, nickel and other alloy steel ingots and castings; annual cap., 12,000 tons.

Electric Steel Castings Co. (The), Milwaukee, Wis., see 1916 Directory, p. 135, electric fur. not completed; company out of business.

ELECTRIC STEEL CO., 3100 South Wood St., Chicago, Ill.

Inc. Nov., 1915 in Illinois. Capital stock: com. auth. \$250,000, issued \$200,000.

C. Piez, P.; J. M. Olmsted, 1 V. P.; W. J. Nugent, 2 V. P.; P. L. Coonley, Sc. & T.; C. A. McDonald, A.; John Marr, G. S.; K. Pittman, G. S. M.; J. Shepard, P. A.

Works at 3100 South Wood St.: blt. 1915-16; f. o. Mar. 15, 1916; 2 Snyder electric fur. (1-ton, 3-ton); 1 Moore electric fur. (3-ton).

Product: truck and tractor castings and general castings up to 1,000-lb.; vanadium alloy steel castings; annual cap., 12,000 tons.

ELECTRIC STEEL CO. OF INDIANA, Indianapolis, Ind.

Inc. Oct., 1913 in Indiana. Capital stock: com. auth. \$200,000, issued \$139,400.

J. Rogers Holcomb, P.; R. B. Farquhar, Jr., V. P.; Thomas A. Elder, Sc. & T.

Sales agents: Chicago and Cincinnati, W. W. Pettis & Co.; Detroit, General Castings Co.; Portland, Ore., Oregon Sales Co.

Works at Indianapolis: one 3-ton Heroult electric fur.; blt. 1914-15, f. o. May, 1915; charge cold metal.

Product: electric steel castings for sale, machinery castings, etc.; annual cap., 2,500 tons.

ELECTRIC STEEL FOUNDRY, 24th and York Sts., Portland Ore.

Inc. Sept., 1913 in Oregon. Capital stock: com. auth. \$150,000, issued \$116,000.

C. F. Swigert, P.; C. F. Swigert, Jr., V. P.; George F. Schott, Sc.; C. W. Schad, G. S.; E. G. Swigert, G. S. M.

Selling agents: San Francisco, L. E. Fuller, 182 5th St.; Vancouver, B. C., Canadian Williamette Co., Rogers Bldg.

Works at 24th & York Sts.: blt. 1907; f. o. electric fur. Mar. 5, 1914; two 2-ton Girod electric fur.

Product: steel castings for sale; manganese steel castings; annual cap., 5,000 tons.

Electro Foundries, Ltd., Orillia, Ontario, Canada.

Plant at Orillia, equipped with a 1-ton electric fur. for production of low-phosphorus pig iron. Plant idle and company going out of business.

ELECTRO METALLURGICAL CO., Forty-Second St. Bldg., New York, N. Y.

E. F. Price, P.; W. J. Knapp, V. P.; B. O'Shea, V. P.; F. E. Lawton, T.; E. S. Whitney, Sc.

Electro Metallurgical Co. owns and operates the Kanawha Works, Glen Ferris, W. Va.; the Niagara Works, Niagara Falls, N. Y.; and the Virginia Works, Holcomb Rock, Va.

The plants are all equipped with furnaces for the manufacture by electricity of ferro-alloys, including high and low carbon ferro-chromium, 50% and 75% ferro-silicon, etc., and other electro-metallurgical products. Electricity is generated by water power.

ELECTRO METALS, Ltd., Welland, Ont., Canada.

L. Clarke Raymond, P.; Walter Gaston, V. P., T. & G. M.; M. Z. Marshall, Sc.

Works at Welland, Ontario: blt. 1907 and f. o. Nov., 1907; equipped with furnaces for the manufacture by electricity of ferro-silicon and other ferro alloys. Electricity generated by water power at Niagara Falls.

ELECTRO STEEL CO., Inc. (The), Jones Bldg., Pittsburgh, Pa.

Inc. 1910 in New Jersey.

Charles R. Bryson, P. & G. M.; F. E. Bryson, Sc. & T.

Trade mark "Gysinge Electro Steel."

Works at Pittsburgh: blt. 1904; f. o. 1904; Kjellen electric fur.

Product: steel ingots, castings and high speed steel; annual cap., 1,500 tons.

ELLA FURNACE CO. (The), 514 Frick Bldg., Pittsburgh, Pa.

Inc. Mar. 26, 1912 in Ohio. Capital stock: com. \$200,000.

E. W. Mudge, P.; C. B. Ferree, V. P., T. & G. S. M.; R. G. Campbell, Sc.; E. W. Pogue, A.; O. G. Leichter, G. M.; J. L. Anderson, P. A.; at Pittsburgh. E. J. McCleary, G. S.; William Hollabaugh, S.; at West Middlesex, Pa.
Brand: "Ella."

Ella Furnace, West Middlesex, Pa.: 1 stack, 80' x 16'; blt. and blown in, 1882; last remodeled 1909; relined 1919; 4 Wheeler pipe hot blast stoves; 3 steam blowing eng. (35,000 cfm.); 7 water-tube boilers, 2,400 H. P.; 1 slag granulating pit, annual cap., 46,500 tons. Conn. coke: Lake ore.

Product: bessemer and basic pig iron; annual cap., 80,000 tons.

EL PASO FOUNDRY & MACHINE CO., El Paso, Texas.

Inc. 1890 in Texas. Capital stock: com. \$300,000; bonds \$45,000. W. N. Small, P. & G. M.; C. G. Hawkinson, Sc. & T.; Wm. Beatty, G. S.; Walter Grayson, P. A.

Works at El Paso: blt. 1907; 2 side-blown converters (3-ton); f. o. Oct. 23, 1907; 3 cupolas. Fuel, coke and oil. Gray iron and semi-steel foundry.

Product: steel castings for sale for railroad work and mining machinery, annual cap., 500 tons; gray iron and semi-steel castings, annual cap., 4,500 tons.

ELYRIA IRON & STEEL CO. (The), 232 E. 131st St., Cleveland, Ohio.

Inc. Aug. 1902 in Ohio. Capital stock: com. auth. \$1,000,000, issued \$868,560; pref. 7% cum. auth. \$500,000, issued \$474,900; bonds \$210,000.

Hugh B. Wick, P.; Myron A. Wick, V. P.; George F. White, Sc. & T.; J. B. Martin, A.; E. F. Jones, G. M.; W. T. Bentz, G. S. M.; E. Falk, P. A.; at Cleveland. Walter Ferrier, G. S.; at Elyria, Ohio.

Works at Elyria, Ohio: blt. 1902-03, f. o. 1903; rolling mills, machine shop, and pipe galvanizing dept. Product: tie plates, light structural shapes, skelp, hot and cold rolled strip; annual cap., 50,000 tons.

Works at 232 East 131st St., Cleveland; blt. 1915. Product: oxy-acetylene welded tubing.

Embree Iron Co., Chicago, Ill., see 1916 Directory, p. 137. Furnace at Embreeville, Tenn., idle since 1909 was sold and dismantled in 1918-19.

EMERY STEEL CASTINGS CO. (The), Continental Bldg., Baltimore, Md. Inc. Mar. 12, 1920. Successor to The Emery Steel Co.

I. C. Emery, P.; L. J. Emery, Sc. & T.

Works at 210 N. Garrison Lane, Baltimore (leased); blt. 1919, f. o., July 1, 1919; crucible steel fur.

Product: small crucible steel castings, annual cap., 1,000 tons.

Building new plant at St. Charles St. & B. & O. R. R., Baltimore: one 1½-ton Moore electric fur. annual cap., 3,000 tons.

Empire Foundry and Machine Works, Chester, Pa., see 1916 Directory, p. 137. Works dismantled.

EMPIRE ROLLING MILL CO. (The), Bessemer Ave., Cleveland, Ohio.

Inc. 1899 in Ohio. Capital stock: com. \$300,000.

C. G. Barkwill, P.; A. W. Ellenberger, V. P.; D. R. James, Sc., T., G. M. & G. S. M.; J. D. Paton, G. S.; W. P. James, P. A.

Selling agents: Bourne-Fuller Co., Hickox Bldg., Cleveland, Ohio.

Works at Cleveland: blt. 1900; f. o. Dec. 15, 1900; 4 single puddling fur.; 6 single busheling fur.; 1 rotary squeezer; 4 heat. fur. (two 4-d. gas, two 4-d. coal); 2 gas producers; 12" 3-h. 1-st. roughing; 10" 3-h. 4-st. Belgian; and 16" 3-h. 4-st. bar; 6 sheet mills (five 38", one 44"); four 48" cold mills; 2 box annealing fur.; 1 pickling mach. Fuel, prod. gas and coal.

Product: muck and scrap bar, iron and steel merchant bar, black sheets; annual cap., 25,000 tons muck and scrap bar, 40,000 tons merchant bar, 30,000 tons black sheets.

EMPIRE STEEL AND IRON CO., Catasauqua, Pa.

Inc. Mar. 13, 1899. Capital stock: com. \$1,254,770; pref. 6% cum. \$2,500,000.

Leonard Peckitt, P.; J. S. Stillman, Sc. & T.; W. H. Miller, P. A.; at Catasauqua, Pa. C. H. Zehnder, V. P.; at 120 Broadway, New York.

Selling agents: Rogers, Brown & Co.

Brands: "Crane," "Crane Basic," "Macungie," "Oxford," "Topton."

Product: foundry, forge, and basic pig iron.

BLAST FURNACES.

Crane Furnaces, Crane Iron Works, Catasauqua, Pa.: 2 stacks; No. 1, 77½' x 17½', blt. 1839; blown in July 3, 1840; last rebt. 1901; 3 Cowper stoves; No. 2, 90' x 20' 6", blt. 1850, last rebt. 1920; 3 Cowper stoves; 5 vertical steam blowing eng. (90,000 cfm.); 11 water-tube boilers, 3,487 H. P. Coke: New Jersey magnetic, Pennsylvania hematite, Lake Superior, and foreign ore. (Operated by Crane Iron Works; controlled by the Empire Steel and Iron Co.). Product: foundry and basic pig iron, annual cap., 185,000 tons.

Macungie Furnace, Macungie, Pa.: 1 stack, 56' x 16', f. o. Sept. 14, 1874; repaired 1902; 1 Durham, 2 Kent stoves; 2 steam blowing eng. (28,000 cfm.); 10 boilers (4 water-tube, 6 cylindrical) 800 H. P. Anthracite coal and coke; New Jersey magnetite, native hematite and Lake ore. Product: foundry and forge pig iron, annual cap., 25,000 tons.

Oxford Furnace, Oxford, N. J.: 1 stack, 80' x 17½', blt. 1871; remod. 1900 and 1908; four 2-pass stoves with equalizer, 20' x 80'; 2 steam blowing eng., 1 turbo-blower (40,000 cfm.); 5 water-tube

boilers 1,300 H. P. Coke: magnetite ore mined near furnace. Product: basic, foundry and forge pig iron annual cap., 85,000 tons.

Topton Furnace, Topton, Pa.: 1 stack, 70' x 16', b.lt. 1873, remod. 1888; rebt. 1892, repaired 1902; 3 Gordon fire-brick stoves; 2 steam blowing eng. (28,000 cfm.); 6 boilers (4 water-tube, 2 cylindrical) 950 H. P. Anthracite coal and coke; New Jersey magnetite, native hematite, and Lake ore. Product: foundry and forge pig iron, annual cap., 40,000 tons.

IRON ORE AND COAL LANDS, COKE OVENS, ETC.

The company owns at Oxford, N. J., about 2,500 acres of iron ore lands and in addition controls the mineral rights for 8,000 acres. It owns the iron ore property of the Mount Hope Mining Company in New Jersey, containing in all about 1,700 acres of land. At Mount Hope, N. J., there is an iron ore concentrating plant, annual cap., 225,000 tons. Annual cap. of the combined New Jersey mines is 400,000 tons of finished ore. In addition the company owns a tract of land in Berks County, Pa., containing a deposit of iron ore not developed at present.

The company also controls and operates the Mount Hope Mineral Railroad, 4.06 miles long, which connects the Mount Hope and other iron ore mines with the Central Railroad of New Jersey and the Delaware, Lackawanna and Western Railroad at Wharton, N. J.

Also controls the Victoria Coal and Coke Company, which owns about 1,500 acres of coal lands and 135 beehive coke ovens at Caperton, W. Va. Annual cap. of the mines, 120,000 tons of coal and 35,000 net tons of coke.

EMPORIUM IRON CO., Emporium, Pa.

Inc. Aug., 1913. Capital stock: com. auth. \$100,000, issued \$92,500.

Sales agents: New York City, Crocker Bros.

Brand: "Emporium."

Emporium Furnace, Emporium (leased; owned by Sinnemahoning Iron & Coal Co.): 1 stack, 75' x 16', b.lt. 1887-88, f. o. Nov., 1888; 3 Siemens-Cowper stoves, 70' x 18'; 2 steam blowing eng. (23,040 cfm.); 6 water-tube boilers, 1,500 H. P. Coke; brown hematite ore. 100 beehive coke ovens, annual cap., 40,000 net tons.

Product: foundry pig iron, annual cap., 45,000 tons.

ENTERPRISE FOUNDRY CO., 20 Steuart St., San Francisco, Cal.

Henry Martens, P.; Charles Hoehn, V. P.; J. W. Heaney, Sc.; A. J. Martens, T. & P. A.; H. Niemann, G. M.

Works at South San Francisco: b.lt. 1909; f. o. June 2, 1909; two 8-pot crucible fur. dismantled 1917; one 15-ton B. O. H. fur.; 2 electric fur. (1-ton); 7 cupolas. Fuel, oil.

Product: steel castings for sale and own use; annual cap., 3,000 tons (2,500 tons O. H., 500 tons electric). Also make gray iron and brass castings; annual cap. 6,000 tons iron, 300 tons brass castings.

ERIE CRUCIBLE STEEL CO., Erie, Pa.

Inc. Aug. 24, 1918 in Pennsylvania. Capital stock: com. \$150,000; pref. 8% cum. \$150,000.

Frank H. Payne, P.; F. C. Kirkpatrick, V. P. & G. M.; D. J. Driscoll, Sc. & P. A.; George R. Metcalf, T.; W. H. Laing, S.; E. W. Strong, G. S. M.

Selling agents:

Boston, M. A. Palmer Co., 469 Atlantic Ave.

Chicago, D. A. Bonitz, 1816 Fisher Bldg.

Cleveland, Cleveland Steel Supply Co.

New York, Tidewater Steel Products Corp., 149 Broadway.

Works at Erie, Pa.: blt. 1918-19; steel first made Mar., 1919; one 30-pot crucible fur.; 4 ham. (750-lb. to 3,000-lb.). Fuel, coal.

Product: steel ingots; nickel, chrome, tungsten and vanadium alloy steel ingots; annual cap., 400 tons. Carbon, alloy and high speed tool steels.

ERIE FORGE & STEEL CO., Erie, Pa.

Inc. Aug. 22, 1912 in Pennsylvania. Capital stock: com. \$10,000.

Subsidiary of Erie Forge Co.

R. F. Devine, P. & G. M.; G. W. J. Stout, V. P. & G. S.; R. F. Devine, Jr., Sc. & T.; J. L. Whalen, G. S. M.; F. P. Boyd, P. A.

Works at Erie, Pa.: blt. 1917-18; two 50-ton B. O. H. fur.; one 12,000-lb. ham.; 2 forging presses (1,500-ton, 2,000-ton); forge shop, machine shop and heat treating department.

Product: steel ingots, annual cap., 75,000 tons; nickel, chrome and vanadium alloy steel ingots; steel forgings, 35,000 tons.

ERIE FORGE CO., Erie, Pa.

Inc. May 1, 1903 in Pennsylvania. Capital stock: com. auth. \$1,000,000, issued \$642,000; bonds \$463,000.

R. F. Devine, P. & G. M.; H. E. Fish, V. P.; R. F. Devine, Jr., A. P.; H. C. McLaughlin, Sc.; G. W. J. Stout, T. & G. S.; J. L. Whalen, G. S. M.; F. P. Boyd, P. A.

Works at Erie: blt. and f. o. 1873; first steel made May 17, 1909; 1 A. O. H. fur. (35-ton); 2 B. O. H. (50-ton); 6 steam ham. (1,500-lb. to 10-ton); 2 forging presses (1,000-ton, 1,500 ton); heat treating plant; machine shops. Steel foundry. Fuel, oil and coal.

Product: carbon and alloy steel ingots for own use and for sale; forgings, rough machined and finished, from 10 lbs. to 25 tons; annual cap., 20,000 tons acid and 50,000 tons basic ingots. Steel castings, 1-lb. to 50-ton, annual cap., 60,000 tons.

EVANSVILLE TOOL WORKS, Evansville, Ind.

Inc. Nov. 6, 1897 in Indiana. Capital stock: com. \$100,000.

Frank Lohoff, P.; Samuel L. Orr, V. P.; J. M. Stricker, Sc. & T.

Works at Evansville: blt. 1887; first steel made Oct., 1887; four 4-pot crucible fur.; 2 box annealing fur.; 12 trip ham.; 12 small forging presses. Fuel, coke. Machine shop for own use.

Product: steel castings from 1-lb. to 500-lb. for gear blanks, crank shafts, etc., for own use and for sale; annual cap., 150 tons. Forged steel hatchets, hammers, sledges, etc.

EVERETT STEEL CO., 3010-20 Smith Ave., Everett, Wash.

Inc. April, 1918 in Washington. Capital stock: com. \$30,000.

T. B. Sumner, P.; F. R. Faller, V. P. & G. M.; F. E. Powell, Sc. & T.

Works at Everett: blt. 1918; f. o. Aug. 15, 1918; 1 Greene electric fur. (1-ton).

Product: steel castings for sale; annual cap., 1,000 tons.

EWALD IRON CO. OF DELAWARE, Louisville, Ky.

Inc. June 12, 1915 in Delaware. Capital stock: com. \$1,000,000; pref. 7% cum. auth. \$500,000, issued \$175,000.

Baylor Hickman, P.; S. E. Frazee, V. P.; G. O. Boomer, Sc. & T. Brands: "Tennessee Charcoal Bloom," "Laurel" and "E. I. C."

Works at Louisville: rolling mill blt. 1869; 14 single puddling fur.; 1 squeezer; 6 heat. fur. (five 2-d. one 3-d.); 18" 2-h. 2-st. muck, 8" 3-h. 4-st. guide, 16" 2-h. 2-st. bar, 16" 2-h. 1-st. universal. Fuel, coal. Charcoal forge; 8 knobbling, 8 forge, and 8 run-out fires; 2 ham. (8-ton, 10-ton); steam power. Fuel, charcoal.

Product: merchant bar and guide iron; annual cap., single turn, 12,000 tons; charcoal blooms, billets and hammered bars for sale, annual cap., 1,000 tons.

EXOLON COMPANY (The), 110 Brookline Ave., Boston, Mass.

Inc. Feb. 11, 1914 in Massachusetts. Capital stock: com. auth. \$450,000, issued \$336,100; pref. 7% cum. auth. \$150,000, issued \$115,000.

Herbert T. Kalmus, P.; William A. Harty, V. P., Sc., T. & G. M.; L. I. Russell, A. T.

Plant at Thorold, Ontario: f. o. 1915; 8 electric fur. Electric power from Toronto Power Co.

Product: ferro-silicon as by-product in manufacture of abrasives; annual cap., 2,000 tons ferro-silicon. Artificial abrasives, silicon carbide, artificial corundum.

FAHNESTOCK MANUFACTURING CO. (The), Avonmore, Pa.

Inc. July 25, 1915 in Delaware. Capital stock: com. auth. \$500,000, issued \$136,500.

D. M. Fahnestock, P. & G. M.; Edward T. Williams, V. P., T., G. S. M. & P. A.; George E. Porter, G. S.; at Avonmore. W. I. Allinder, A.; at Pittsburgh.

Sales office: Baltimore, John K. Bosee, 21 W. Saratoga St.

Works at Avonmore, Pa.: blt. 1905-06; one 20-ton A. O. H. fur. (Formerly owned by Kiski Steel Casting Co.; acquired by Fahnestock Mfg. Co., Mar. 1, 1916.)

Product: steel ingots and castings for sale; manganese, chrome and nickel alloy steel ingots and castings; rolling mill and machinery castings; annual cap., 7,200 tons of ingots or 3,600 tons of castings.

FAIR (S.) & SON, Inc., North Hamilton St., Saginaw, Mich.

Inc. Dec., 1909 in Michigan. Capital stock: com. \$75,000.

Louis G. Fair, P., T., G. M. & P. A.; Ernest A. Snow, V. P.; Elizabeth Houlihan, Sc. & A.; S. S. Fair, Jr., G. S.

Works at North Hamilton St., Saginaw: blt. 1909; f. o. Mar. 1909; one 1,500-lb. Snyder electric fur.; first electric steel, Sept. 10, 1915; crucible steel fur. (five 6-pot), blt. 1909, discontinued in 1916.

Product: electric steel castings for sale; vanadium alloy steel castings for automobiles and trucks, and miscellaneous castings; annual cap., 3,500 tons.

FAIRBANKS STEAM SHOVEL CO. (The), 219 Leader St., Marion, Ohio.

Inc. Feb. 6, 1906 in Ohio. Capital stock: com. \$200,000; pref. 6% cum. auth. \$200,000, issued \$84,900.

James G. Fairbanks, P. & G. M.; Charles W. Fairbanks, Sc. & T.; George W. Davisson, P. A.; at Marion. O. P. Lennox, V. P.; at Columbus, Ohio.

Works at Marion: one 1-ton Snyder electric furnace, installed 1919, f. o. May, 1919.

Product: steel castings for own use, annual cap., 1,000 tons.

FALCON STEEL CO. (The), Warren Ave. Extension, Niles, Ohio.

Inc. June 2, 1919 in Ohio. Capital stock: com. auth. \$1,500,000; pref. 7% cum. auth. \$1,000,000.

Lloyd Booth, P. & T.; Paul Wick, V. P. & Sc.; C. C. Walker, A.; W. W. Lewis, G. S.; George E. Harris, G. S. M.; R. H. Grove, C. E.

Works at Niles, Ohio: construction begun July 2, 1919; one 30" x 60" 2-h. jobbing plate mill; 7 hot black sheet mills (29" x 36", two 29" x 48", four 29" x 44"); 4 cold mills (24" x 60", 24" x 48", 24" x 42", 24" x 38"); two 4-box annealing fur.; 2 pickling mach.; 3 galv. pots, annual cap., 36,000 tons. First sheets rolled March 1, 1920.

Product: black, galvanized, blue annealed and corrugated steel sheets; roofing products; annual cap., 60,000 tons.

FALK CO. (The), Milwaukee, Wis.

Inc. 1895 in Wisconsin. Capital stock: com. \$1,000,000; pref. 6% non-cum. \$250,000.

Herman W. Falk, P.; Otto Falk, 1 V. P.; Clarence R. Falk, 2 V. P.; Emanuel A. Wurster, Sc. & T.; Harold S. Falk, G. S.

Selling agents: New York, M. P. Fillingham, 50 Church St.; Pittsburgh, Walter O. Beyer, Park Bldg.; San Francisco, F. W. Grimwood, Rialto Bldg.

Works at foot of 30th St., Milwaukee: blt. 1900, enl. 1905; first O. H. steel made April 7, 1900; 3 Wellman-Seaver A. O. H. fur. (15, 18 and 20-ton). Stoughton converter (3-ton) added 1910, abandoned, 1916.

Product: steel castings for sale and own use; annual cap., 25,000 tons.

FALLS HOLLOW STAYBOLT CO., Cuyahoga Falls, Ohio.

Not incorporated.

C. M. Walsh, G. M.; J. F. Finnerty, S.; G. H. Mansfield, G. S. M.; H. I. Dyke, P. A.

Selling agents:

Atlanta, Spaulding & Small, 1010 Hurt Bldg.

Boston, Austin & Doten, 102 North St.

Buffalo, Beals, McCarthy & Rogers.

Chicago, Warren Corning & Co., Transportation Bldg.

New York, Charles Hubbard & Co., 81 Fulton St.

Philadelphia, Read-Rittenhouse Co., 1234 Commercial Trust Bldg.

St. Louis, Certes Supply Co., Frisco Bldg.

San Francisco, Berger & Carter Co., 17th & Mississippi Sts.

Seattle, A. M. Castle & Co.

Works at 21 E. Portage St., Cuyahoga Falls: blt. 1865; rebt. 1884; remod. 1903; 4 oil heat. fur. (three 2-d., one 3-d.); 22" 2-h. 1-st. Belgian; 16" 3-h. 4-st. skelp, 10" 2-h. 6-st. bar. Fuel, oil.

Product: hollow and solid staybolt iron bars; annual cap., 3,000 tons.

Farist Steel Co. (The), Bridgeport, Conn., see 1916 Directory, p. 142.

Works at Bridgeport destroyed by fire in 1916. Property sold and company out of business.

FARRELL-CHEEK STEEL FOUNDRY CO. (The), Box 371, Sandusky, Ohio.

Inc. May, 1910 in Ohio. Capital stock: com. \$50,000.

Herbert Farrell, P. & G. M.; J. O. Cheek, V. P.; John E. Sweet, Sc. & P. A.; R. C. Farrell, T.; H. B. Castleman, A.; Fred Knapper, G. S.; F. F. Picksley, G. S. M.

Works at Sandusky, Ohio: blt. 1910; f. o. Oct. 17, 1910; 2 Bretau converters (1-ton); 1 Moore electric fur. (3-ton); 2 cupolas. Fuel, coke and nat. gas.

Product: steel castings for sale for automobile parts, machine tool parts, rolling mill machinery, electrical machinery and motor frames; case hardening, carbonizing and annealing boxes; nickel, chrome and vanadium alloy steel castings; annual cap., 1,000 tons steel castings (500 tons converter; 500 tons electric).

FEDERAL STEEL FOUNDRY CO., foot of Reaney St., Chester, Pa. Inc. June 13, 1906 in Pennsylvania. Capital stock: com. \$250,000; pref. 6% non-com., auth. \$250,000, issued \$212,000.

J. H. Mull, B.; H. B. Taylor, V. P.; C. T. Taylor, Sec. & T.; George D. Martin, A.; at Philadelphia. Frank Overn, G. M.; Thomas Mitchell, Shop S.; F. C. Hamilton, A. M., G. S. M. & P. A.; at Chester.

Selling agent: Carroll S. Smith, 100 Broadway, New York.

Works at Chester: blt. 1903-4; 2 B. O. H. fur. (30-ton, 25-ton); annealing fur.; first steel made June 27, 1904. Fuel, oil.

Product: steel castings, annual cap., 8,000 tons.

Ferguson Tin Plate Co., Pittsburgh, Pa., see 1916 Directory, p. 143; plant for redipping terne plates, idle since 1917.

FERRO ALLOY CO. (The), 603-613 Symes Bldg., Denver, Col.

Inc. Sept. 23, 1916 in Colorado. Capital stock: com. auth. \$150,000, issued \$100,000.

Guilford S. Wood, P.; Nelson Franklin, V. P., G. M. & G. S. M.; George A. Stahl, Sec.; Adolph F. Zang, T.; Thomas H. Sheldon, A. & P. A.; S. B. Tyler, G. S.

Works at Utah Junction, Col.: blt. 1916-17; f. o. Mar., 1917; 4 electric fur.; hydro-electric power from the Colorado Power Co., Denver.

Product: ferro-chrome, ferro-tungsten and ferro-silicon; annual cap., 3,000 tons.

Findlay Steel Castings Co., Findlay, Ohio. Organized and incorporated Sept. 22, 1916. Purchased plant of Grant Motor Car Corp. at Findlay, Ohio. Project abandoned during latter part of 1917 and plant reverted to Grant Motor Car Corp. All equipment installed was sold and dismantled.

Firth (Rowland) & Son Co., Inc., Phillipsburg, N. J., see 1916 Directory, p. 143. Plant at Phillipsburg held by Nicholas Gibney, trustee for bondholders, sold to Standard Process Steel Corp. Nov. 6, 1916.

FIRTH-STERLING STEEL CO., McKeesport, Pa.

Inc. July 11, 1889 in Pennsylvania. Capital stock: com. \$1,000,000; pref. 7% cum. \$500,000.

Lewis J. Firth, P.; E. D. Gray, Sc.; D. E. Jackman, T. & G. S. M.; Roy H. Davis, G. M.; L. Gerald Firth, Works M.; H. R. Huemme, P. A.; at McKeesport. James W. Kinnear, V. P.; at Oliver Bldg., Pittsburgh.

Sales offices:

Boston, E. T. Jackman, Mgr., 85 West First St.
 Chicago, E. S. Jackman & Co., 710 West Lake St.
 Cleveland, E. S. Jackman & Co., 333 Frankfort Ave.
 New York, D. G. Clark, Mgr., 312 Hudson St.
 Philadelphia, MacFarland & Little, 721 Arch St.
 Pittsburgh, E. S. Jackman & Co., 1422 Oliver Bldg.
 Brand: "Firth-Sterling."

Demmler Works, Demmler Station, McKeesport, Pa.: est. 1875; first crucible steel made 1875; three 30-pot crucible fur.; 2 Heroult electric fur. (3-ton and 2-ton); 1 B. O. H. fur. (5-ton); 21 Swindell heat. fur. (three 1-d., nine 2-d., seven 3-d., two 4-d.), 3 gas producers; 16" 3-h. 5-st., 12" 3-h. 6-st., 10" 3-h. 7-st. and 8" 3-h. 5-st. bar mills; 4 box annealing fur.; 5 pipe annealing fur.; 10 steam hammers (1,000-lb. to 12,000-lb. and 2 tilt.). Fuel, bit. coal and nat. gas. Make ferro-tungsten for own use only.

Product: steel ingots, alloy steel ingots; annual cap., 9,900 tons (4,200 tons crucible, 2,700 tons electric and 3,000 tons O. H. steel ingots); carbon and alloy tool steels, rolled or hammered.

Flickwir, David W., Roanoke, Va., see 1916 Directory, p. 144, sold West End Furnace, Roanoke, Va., to John W. Hubbard, Pittsburgh, Pa., in May, 1917; furnace leased to Old Dominion Pig Iron Corporation, May 11, 1917 to Dec. 31, 1919, see Hubbard, John W.

FLUID COMPRESSED STEEL CO., Keokuk, Iowa.

Inc. June 30, 1918 in Iowa. Capital stock: com. auth. \$225,000, issued \$40,000; pref. 8% cum. auth. \$100,000, issued \$60,000.

N. T. Wilcox, P.; G. E. Weissenburger, V. P.; J. O. Boyd, Sc. & T.; E. H. Wilcox, M. S. & P. A.

Works at Keokuk, Iowa: blt. 1919; 1 Snyder electric fur. (2-ton). Fuel, electricity, coal and oil. First operated Dec. 2, 1919.

Product: special process steel and alloy steel ingots, steel pipe, hollow shafting, gears, gear blanks; carbon and alloy steel castings; annual cap., 4,000 tons.

FOLLANSBEE BROTHERS CO., 3rd and Liberty Sts., Pittsburgh, Pa.

Inc. Sept. 6, 1894 in Pennsylvania. Capital stock: com. \$2,000,000.

B. G. Follansbee, Ch.; William U. Follansbee, P.; John Follansbee, V. P. & G. S. M.; W. D. Reid, Sc. & A.; C. A. Wilson, A. P.; E. Masters, A. A.; at Pittsburgh. William Banfield, V. P. & G. S.; at Follansbee, W. Va.

Sales offices :

Buffalo, Ed. Harper, P. O. Box 876.

Detroit, H. B. Jones, 159 W. Congress St.

Indianapolis, E. C. Folkner, 321 South Missouri St.

Louisville, A. G. Hinderer, 14th & Broadway.

Memphis, Ed. Schrader, 705 South 5th St.

Nashville, George W. Nuckols, 164 2nd Ave., N.

New York, Albert Mathews, 1373 Hudson Terminal Bldg.

Rochester, W. B. Slifer, P. O. Box 286.

Works at Follansbee, West Va. : blt. 1902-04 ; first products rolled Sept. 6, 1904 ; first steel ingots made Dec. 10, 1906 ; 4 B. O. H. fur. (40-ton) ; four 4-d. ingot reheat. fur. ; one 8-ton ham. for cogging ingots ; 30" 2-h. 1-st. reversing bar mill ; 13 pair and 13 sheet fur. (5 gas-fired, 8 powd. coal) ; 7 sheet mills (one 30" x 48", three 30" x 44", one 30" x 38", two 28" x 38") ; 6 tin mills (three 28" x 36", three 28" x 32") ; 8 sets sheet cold rolls, 6 single stand, one 2-st. tandem (five 28" x 60", three 24" x 50") ; 6 sets tin cold rolls (24" x 42") ; 14 box annealing fur. (eight 2-pot and two 1-pot sheet ; four 8-pot tin) ; 2 hand pickling tanks ; 3 galv. pots, annual cap., 14,500 tons. Tin and terne plate departments: blt. 1903-4 ; first tin and terne plates made Sept., 1904 ; 12 sets, 7 for tinplates (1 for coke, 6 for charcoal), 5 for terne plates. Fuel, nat. gas and powd. coal.

Product : ingots, sheet and tinplate bars, black and galvanized sheets, black plate for tinning, blued products, enameling and nickeling stock ; and tinplates and terne plates ; annual cap., 100,000 tons ingots ; 90,000 tons sheet and tinplate bars, 65,000 tons sheets and black plate for tinning, 250,000 boxes tinplates, 221,000 boxes terne plates.

Works at Toronto, Ohio : under construction ; four 40-ton B. O. H. fur. ; one 1,000-ton forging press ; 4 ingot reheating fur. ; 30" 2-h. 1-st. reversing sheet bar mill ; 10 hot black sheet mills (three 40", three 44", four 50") ; 10 cold sheet mills ; 10 sheet and 10 pair fur. ; 2 continuous annealing fur.

FORD MOTOR CO., Detroit, Mich.

Edsel B. Ford, P. ; F. L. Klingensmith, V. P. & T. ; B. J. Craig, Sc. Rouge Plant, River Rouge, near Detroit, Mich. : 2 stacks, construction begun Feb., 1917, to be operated in 1920 ; 83' 8" x 22' 9" ; 8 Kennedy stoves, 110' x 24' ; 3 turbo-blowers ; 4 water-tube boilers, 10,588 H. P., serve also coke ovens and foundry ; 1 Heyl & Patterson double-strand casting mach. By-product coke : Lake ore. By-product coke plant with 120 Semet-Solvay ovens, annual cap., 600,000 net tons coke ; by-product recovery plant ; Semet-Solvay benzol plant, annual cap. 2,187,500 gals. light oil. Gray iron foundry for manufacture of automobile parts. Molten metal from blast furnaces direct to foundry.

Product : foundry pig iron, annual cap., 365,000 tons.

Detroit Plant, Detroit: 3 electric fur. (one $\frac{1}{4}$ -ton Gronwall-Dixon, one $\frac{1}{2}$ -ton Greaves-Etchells, one 3-ton Greaves-Etchells).

Product: steel castings and steel ingots for own use, annual cap., 3,000 tons.

FORGED STEEL WHEEL CO., Frick Bldg., Pittsburgh, Pa.

Inc. June 20, 1906. Capital stock: com. \$1,000,000; pref. 6% cum. \$750,000.

J. M. Hansen, P.; William Bierman, Sc.

Sales office:

Baltimore, Md., Continental Bldg.; Chicago, Ill., Fisher Bldg.; New York, N. Y., 170 Broadway.

Works at Butler, Pa.: blt. 1909-10; 10 B. O. H. fur. (60-ton); 34" slabbing mill; first steel made Oct. 12, 1910, first slabs rolled Oct. 12, 1910; 18" and 12" bar mills; plate mill. Fuel, natural and producer gas. Machine shop for own use.

Product and annual cap.: ingots 360,000 tons; blooms, billets and slabs, 220,000 tons; merchant bars, 140,000 tons, structural shapes, 21,500 tons; and universal and sheared plates, 10,000 tons; all for own use. Forged steel car wheels, annual cap., 50,000 tons forgings.

FORT DODGE CULVERT & IRON MILLS CO., Fort Dodge, Iowa.

Inc. 1906 in Iowa. Capital stock: com. auth. \$600,000, issued \$400,000; pref. auth. \$200,000.

C. L. Carter, P. & G. M.; E. A. Law, Sc. & G. S. M.; M. P. Chumlea, T.; John McGaff, G. S.; at Fort Dodge. C. E. Kitchin, V. P.; at East Chicago, Ind.

Works at Fort Dodge, Iowa: 1 B. O. H. fur. (10-ton) installed 1919; 2 coal-fired 4-d. heat. fur.; 10" 3-h. 5-st. bar mill; rolled products first made Mar. 1, 1919. Fuel, oil.

Product: steel ingots, annual cap., 12,000 tons; merchant and concrete bars, annual cap., 12,000 tons.

FORT PITT STEEL CASTING CO., McKeesport, Pa.

Inc. 1906 in Pennsylvania. Capital stock: com. auth. \$200,000, issued \$50,000; pref. 7% non-cum. \$200,000.

C. S. Koch, P. & G. M.; Albert Curry, V. P.; H. J. Koch, Sc. & G. S. M.; Wm. L. Curry, T.; H. H. Nicholson, A.; F. B. Taylor, P. A.

Works at Houghton Ave. & B. & O. R. R., McKeesport: blt. 1905-06; first steel made June 15, 1906; 2 side-blown converters (Stoughton 2-ton, Tropenas 2-ton); 2 cupolas; one 3-ton Heroult electric fur. Fuel, nat. gas.

Product: light steel castings (under 300-lb.) for sale; annual cap., 6,000 tons converter, 3,000 tons electric steel castings.

FORT SMITH IRON & STEEL MILLS, Fort Smith, Arkansas.

Inc. Dec. 15, 1915. Capital stock: com. \$25,000.

J. W. Arnold, P. & G. M.; J. E. Arnold, Sc. & T.
Works at Arkoma, Oklahoma: blt. 1913, f. o. Jan., 1914; two 3-d.
scrap heat. fur.; 10" 3-h. 5-st. bar mill.
Product: merchant bar, annual cap., 3,000 tons.

**FORT WAYNE ROLLING MILL CORPORATION (The, Fort)
Wayne, Ind.**

Inc. Jan. 1, 1915 in Indiana. Capital stock: com. auth. \$300,000,
issued \$210,000; pref. 7% cum. auth. \$100,000, issued \$50,000.
E. F. Yarnell, P.; H. C. Rockhill, V. P., T. & G. M.; Ira W.
Langford, Sc. & A.; J. S. Baldwin, G. S.; F. X. Rinehart, G. S. M.
Sales offices: Chicago, P. H. Joyce, Great Northern Bldg.; St.
Louis, Keller & Beckwith, 815 Spruce St.
Brand: "Wayne Special."

Works at 1st & Graeter Sts., Fort Wayne: blt. 1903; f. o. Dec. 23,
1903; 3 double puddling fur., 5 single busheling fur., one 3-d.
pile fur.; four 4-d. heat. fur.; one 6-d. heat. fur.; 20" 3-h. muck,
18" 3-h. bar, 9" 3-h. guide, and 8" 3-h. guide. Fuel, prod. gas
and pulverized coal.

Product: merchant bars, bands, etc.; annual cap., 55,000 tons.

Fox, B. Frank, Hackettstown, N. J., see 1916 Directory, p. 146.
Hackettstown Furnace dismantled in 1917.

FRANKLIN STEEL WORKS, 612 Atlantic Ave., Franklin, Pa.

Owned by the Chicago Railway Equipment Co.
Edward E. Hughes, V. P.; at 60 Wall St., New York. C. F.
Mackey, G. M.; at Franklin, Pa.

Selling agents:

Baltimore, R. C. Hoffman & Co., Inc., Continental Bldg.,
Boston, 12 Pearl Street.
Chicago, McCormick Bldg.
Cleveland, 1320 Rockefeller Bldg.
New York, 30 Church Street.
Philadelphia, 422 Commercial Trust Bldg.

Works at Franklin: orig. blt. 1902-03; f. o. Aug., 1903; rebld. after
fire, 1914; 3 heat. fur. (one 4-d., 2 cont.); 18" bar with 1-st. 2-h.
and 2-st. 3-h.; 9" bar with 1-st. 2-h. and 3-st. 3-h.; 1 comb. 18"
and 12" Belgian with 18" 3-h. 1-st., 12" 3-h. 5-st., and 12" 2-h.
1-st. Fuel, coal. Brake beam shop; machine shop for own use.

Product: steel bars for reinforced concrete; rounds, squares, small
angles, channels, tees, "U" bars, deck sections, shapes for agri-
cultural implements, etc.; annual cap., 75,000 tons.

Frazer, Brace & Co., Montreal, Canada; built in 1917 electric fur-
nace plant for manufacture of low-phosphorus and foundry pig
iron from scrap; acquired by Shawinigan Foundries, Ltd., Jan. 1,
1920.

Frederick Iron & Steel Co., Frederick, Md., acquired the plant of The
Morris Iron & Steel Co., Frederick Md., in April, 1917. Steel con-

verter discontinued; makes gray iron, semi-steel and bronze castings.

FRICK (H. C.) COKE CO., Carnegie Bldg., Pittsburgh, Pa.

Inc. Mar. 31, 1903 in Pennsylvania. Subsidiary of the United States Steel Corporation.

W. H. Clingerman, P.; D. H. Coble, Sc.; Phillip Keller, T.; C. P. Parker, A.; T. S. Duncan, P. A.; at Pittsburgh. Clay F. Lynch, V. P. & G. S.; at Scottdale, Pa.

The H. C. Frick Coke Co., together with other coal and coke companies allied with it but owned or controlled by the United States Steel Corporation, operates or controls coal and coke properties as follows:

The H. C. Frick Coke Co. owns and controls about 78,800 acres of coal and 23,500 acres of surface lands in Western Pennsylvania. It operates 31 coke plants having 11,674 beehive ovens in Fayette County, and 20 coke plants with 6,546 beehive ovens in Westmoreland County. The company owns and operates plants producing coal for sale at Gates, Palmer, Ralph, Sarah and Maxwell mines in Fayette County, the Chambers mine in Westmoreland County, Pa., and the Dilworth mine in Greene County, Pa. At Everson, Fayette County, Pa., it has extensive shops for repairing mine cars and other equipment.

Other companies (all owned or controlled by the United States Steel Corporation), allied with the H. C. Frick Coke Co. and operated under its management, but not included above, together with the properties they own, are as follows:

Republic-Connellsville Coke Co. owns 3,833 acres coal and 675 acres surface lands in Fayette County, Pa.; also coal and coke plant of 100 beehive ovens at Bridgeport, Pa., and a coal plant at Filbert mine.

Sharon Coke Co. owns 989 acres coal and 286 acres surface lands in Fayette County, Pa.; also coal and coke plant of 350 beehive ovens at Ronco, Pa.

Sharon Coal & Limestone Co. holds under lease approximately 3,300 acres of steam coal and limestone property in Butler, Mercer and Lawrence Counties, Pa.; also operates 2 coal mines.

United States Coal & Coke Co. holds under lease about 63,000 acres of coal lands in McDowell and Wyoming Counties, W. Va. and Tazewell County, Va. It has 12 mines and 2,137 beehive coke ovens. The company owns about 74,000 acres of coal and 32,000 acres of surface in Letcher and Harlan Counties, Kentucky, and operates one mine. It owns about 53,000 acres of coal and 32,000 acres of surface in Mingo and Logan Counties, W. Va.

National Mining Co. and Mingo Coal Co. own about 19,000 acres of steam coal in Allegheny and Washington Counties, Pa., and operate 2 producing mines at Sygan, Pa.

The United States Fuel Company owns 74,388 acres coal lands and 5,025 acres surface lands, situated in Vermilion (Westville and Georgetown field) and Franklin and Williamson Counties (Southern Illinois field), Illinois; and in Vermilion and Vigo Counties (Clinton field) and Sullivan County (Linton field), Indiana. On these properties are located seven mines producing coal for steam, gas, and coke making purposes. In connection with the mine in Franklin County, Illinois, there has been erected a modernly equipped coal washing plant of 4,000 tons daily capacity. Incidental to the washing plant a large and ample water supply has been installed.

FROG, SWITCH & MANUFACTURING CO. (The), Carlisle, Pa.
Est. 1881; inc. June 20, 1898 in Pennsylvania. Capital stock: com. \$375,000; bonds, \$250,000.

R. S. Hays, P.; W. H. Dotter, 1 V. P.; William L. Jackson, 2 V. P.; Charles C. Weidner, Sc. & T.

Sales offices:

Los Angeles, A. H. Hoffman, American Bank Bldg.

Pittsburgh, J. S. Morrison Co., Oliver Bldg.

St. Louis, H. A. Johann.

Washington, D. C., A. Gordon Jones, Union Trust Bldg.

Wilkes-Barre, Pa., E. R. Doud Co., 222 Miners Bank Bldg.

Works at Carlisle: foundry blt., 1913; 1 Tropenas converter (2-ton); first steel made July, 1913; eight 8-pot crucible fur. for melting alloys; 1 cupola. Fuel, coke. One 1-ton Snyder electric fur., f. o. Feb. 1, 1917, discontinued and sold in 1918.

Product: manganese steel castings for own use and for sale; manganese steel, manganese insert and plain frogs, switches and crossings, etc.; "Indian Brand" manganese steel castings for frogs, switches and crossings, jaw and gyratory crushers, cement mill and mining machinery, etc.; gray iron castings; annual cap., 2,500 tons converter steel castings.

Fulton Steel Corporation, Fulton, N. Y., incorporated in 1917 and built plant at Fulton, f. o. Mar., 1918. William Nottingham, Edward Quirk and Harry C. Beaver, appointed receivers Oct. 14, 1918. Plant sold to Ontario Electric Steel Co., Jan. 22, 1919.

Gas Traction Foundry Co., Minneapolis, Minn., see Northwestern Steel & Iron Corporation.

General Car & Machinery Co., Montmagny, P. Q., Canada, reorganized as The National Farming Machinery, Ltd. in 1919.

GENERAL ELECTRIC CO., 1 River Road, Schenectady, N. Y.

Inc. April 15, 1892 in New York. Capital stock: com. auth. \$175,000,000, issued \$120,557,200.

E. W. Rice, Jr., P.; G. E. Emmons, V. P.; J. R. Lovejoy, V. P.; A. G. Davis, V. P.; F. C. Pratt, V. P.; M. F. Westover, Sc.; Henry W. Darling, T.; S. L. Whitestone, A.; C. E. Patterson, C.; J. G. Barry, G. S. M.; L. G. Banker, P. A.; at Schenectady. A. W. Burchard, V. P.; G. F. Morrison, V. P.; O. D. Young, V. P.; at 120 Broadway, New York.

Sales offices in all large cities.

Everett Works, Everett, Mass.: blt. 1900; 3 A. O. H. fur. (17-ton); f. o. Dec. 20, 1900. Fuel, oil. Foundry and pattern shop connected with works. Product: steel castings principally for own use for motors, gears, and turbines; annual cap., 16,000 tons.

Lynn Works, Lynn, Mass.: blt. 1892, f. o. Mar. 4, 1893; 3 A. O. H. fur. (20-ton); 1 Heroult electric fur. (6-ton). Fuel, oil. Small crucible fur. for experimental purposes. Also make gray iron castings. Product: steel castings and ingots mainly for own use; annual cap., 2,000 tons electric steel ingots, 14,000 tons steel castings (2,000 tons electric, 12,000 tons O. H.).

Pittsfield Works, Pittsfield, Mass.: 1 Heroult electric fur. (1-ton); mainly used to melt non-ferrous metals. Steel castings first made, June 2, 1919. Installing one 2-ton electric fur. for experimental purposes.

Schenectady Works, Schenectady, N. Y.: 2 Heroult electric fur. (5-ton and 2-ton). Product: tool steel and steel castings, annual cap., 3,000 tons.

Erie Works, Erie, Pa.: one 5-ton Heroult electric fur. added 1919. Gray iron, malleable iron and brass foundry. Product: steel castings for own use for electrical machinery, annual cap., 3,000 tons; gray iron (36,000 tons), malleable iron (6,500 tons), and brass (800 tons) castings.

General Motors Corporation, Detroit, Mich., see Samson Sieve-Grip Tractor Co.

GENERAL STEEL CO., 215 Sycamore St., Milwaukee, Wis.

Inc. July 17, 1917 in Delaware. Capital stock: com. 16,000 shares, no par value; pref. 7% non-cum. \$650,000.

James D. Mortimer, Ch.; Edwin Gruhl, V. P.; James F. Fogerty,

A. Sc. & A. T.; Robert Sealy, T.; F. H. Fiske, A. Sc.; at 30 Broad St., New York. S. B. Way, V. P.; Howard A. Mullett, G. M.; W. L. Dickel, G. S. M.; Frank J. Boehm, A. Sc. & A. T.; at Milwaukee. A. T. Baumer, Works M.; at St. Francis, Wis.

Sales office: Milwaukee, Wis., 215 Sycamore St.

Works at St. Francis, Wis.: blt. 1917-18; first steel made Jan., 1918; 3 Pittsburgh electric fur. (two 12-ton and one 1½-ton); two 4-d. ingot heat. fur.; 1 cont. billet heat. fur.; 24" 3-h. 2-st. billet, 10" 3-h. 5-st. merchant mills, construction not completed; 3 steam hammers (500-lb. to 4000-lb.); 1 forging press (500-ton). Fuel, coal.

Product: steel ingots and castings for own use and for sale, alloy steel ingots and castings; die blocks, blooms, car axles, piston rods, rounds, slabs, etc.; annual cap., ingots and castings, 24,500 tons; forged products, 6,000 tons.

Genesee Furnace Co., Cleveland, Ohio, see 1916 Directory, p. 150; was taken over by The McKinney Steel Co., in Jan., 1918.

Georgia Steel Co., Cartersville, Ga., see 1916 Directory, p. 150, O. T. Peoples, trustee in bankruptcy. Properties acquired by Joel Hurt in September, 1918.

GERLINGER ELECTRIC STEEL FOUNDRY CO., 60th St. & National Ave., West Allis, Wis.

Inc. Nov., 1918 in Wisconsin. Capital stock: com. \$99,000.

George P. Gerlinger, P. & G. M.; W. E. Gerlinger, V. P. & T.; Walter Gerlinger, Sc. & P. A.; Steve Wright, G. S.; at West Allis. O. M. Dennett, G. S. M.; W. C. West, Sales Engineer; at 14 East Jackson Blvd., Chicago.

Sales offices: Chicago, 14 E. Jackson Blvd.; Detroit, M. Dennett, 80 Washington Blvd.

Works at 60th St. & National Ave., West Allis: blt. 1918-19; 1 Moore electric fur. (3-ton); f. o. Jan. 16, 1919.

Product: steel castings, 100-lb. to 3-ton, for sale; annual cap., 9,000 tons.

GERLINGER STEEL CASTING CO., 60th St. & National Ave., West Allis, Wis.

Inc. Mar. 2, 1902 in Wisconsin. Capital stock: com. \$75,000.

W. E. Gerlinger, P. & G. M.; George P. Gerlinger, V. P. & T.; Walter Gerlinger, Sc., & P. A.; at West Allis. O. M. Dennett, G. S. M.; W. C. West, Sales Engineer; at 14 East Jackson Blvd., Chicago.

Sales offices: Chicago, 14 E. Jackson Blvd.; Detroit, M. Dennett, 80 Washington Blvd.

Works at West Allis: blt. 1902-03; four 4-pot crucible fur.; f. o. Jan. 12, 1903, dismantled 1916; 2 Snyder electric fur. (2,000-lb., 3,000-lb.); f. o. Nov. 7, 1915.

Product: steel castings 1-lb. to 100-lb.; automobile and general machinery castings; annual cap., 4,000 tons.

German, Edwin, Slatington, Pa., see 1916 Directory, p. 150, sold rolling mill at Slatington to Iron Products Co., Phila., August 24, 1916. The rolling mill was acquired by Slatington Iron & Steel Co., Dec., 1916.

GERSON ROLLING MILL, Birmingham, Ala.

M. J. Gerson (Owner), Birmingham, Ala.

Works at East Birmingham, Ala.: blt. 1904; two 2-d. scrap heat. fur.; 8" 3-h. 4-st. guide mill. Fuel, coal. (Formerly owned by W. C. Shackelford and leased by Southern Iron & Commission Co.; acquired by M. J. Gerson, May 1, 1918.)

Product: merchant bar; annual cap., 10,000 tons.

GLASGOW IRON CO., Pottstown, Pa.

Inc. Sept. 17, 1875 in Pennsylvania. Capital stock: com. auth. \$500,000, issued \$360,000.

Comly B. Shoemaker, P. & G. M.; Robert Shoemaker, Jr., 1 V. P.; Comly B. Shoemaker, 2nd, 2 V. P.; at 603 Harrison Bldg., Philadelphia. Harry W. Prizer, Sec.; Oliver E. Shuler, T.; C. B. Shoemaker, Jr., G. S.; A. Coleman Smith, A. Sc. & A. T.; at Pottstown. Sales offices: Boston, Harrington, Robinson & Co., 45 Bromfield St.; New York, D. F. Cooney & Co., 88 Washington St.; Philadelphia, 603 Harrison Bldg.

Anvil Furnace, Pottstown, Pa.: (leased; owned by Pottstown Iron Co.), 1 stack, 80' x 17'; blt. 1867, last remod. 1906; 3 fire brick stoves, 76' 3" x 19'; 2 steam blowing eng. (20,000 cfm.); 5 Cahall water-tube boilers, 1,000 H. P. Anthracite coal and coke mixed; magnetite and hematite ores. Product: special pig iron, annual cap., 50,000. *Last active in 1910.*

Glasgow Iron & Steel Works (owned), Ninth Ward, Pottstown, Pa.: blt. 1874; 8 double puddling fur.; 1 rotary squeezer; one 22" 2-h. 1-st. muck mill. Flanging and dishing plant and plant for making buckled plates. Fuel, coal. Sheared plate mill sold to Nagle Steel Co. Product: muck bar; flanged and dished heads, man-hole saddles, pressed steel boiler lugs, pipe flanges and buckled plates, pressed, flanged and welded steel work; annual cap., muck bar, 10,000 tons.

Pottstown Iron Works, Pottstown, Pa. (leased; owned by Pottstown Iron Co.): blt. 1861, enl. 1867; 22 double puddling fur.; 13 Siemens heat. fur. (three 2-d. and ten 3-d.); 18" 2-h. 1-st. muck, 23" 2-h. 2-st. muck, 23" nail plate with 1-st. 3-h. and 2-st. 2-h.; 36" universal plate; 3 sheared plate mills (32" x 112", 26" x 65" and 24" x 60"). Fuel, bit. coal and prod. gas. Product: muck bar, iron and steel universal and sheared plates for boilers, bridges, ships, tanks, etc.; annual cap., 35,000 tons muck bar, 127,000 tons plates.

GLOBE IRON CO., Jackson, Ohio.

Inc. 1872 in Ohio. Capital stock: com. \$120,000.

Eben Jones, P.; Moses Morgan, V. P.; John E. Jones, Sc., T., G. M. & G. S. M.; Charles P. Chapman, A. & P. A.
Brand: "Globe."

Globe Furnace at Jackson: 1 stack, 76' x 17' (jacket built to receive 18½' bosh); blt. 1900-1; f. o. Feb. 12, 1901; remod. 1912-13; relined, 1917; six 2-pass stoves, 75' x 18'; 2 steam blowing eng. (40,000 cfm.); 12 tubular boilers, 1500 H. P. Raw coal and coke: Lake and local ores. Owns and operates limestone quarry in Lawrence Co., Ohio, annual cap., 80,000 tons; also coal mine, annual cap., 60,000 tons.

Product: bessemer ferro-silicon and silvery pig iron; annual cap., 48,000 tons.

GLOBE SEAMLESS STEEL TUBES CO., 33rd Ave. and Burnham St., Milwaukee, Wis.

Inc. April, 1910 in Wisconsin. Capital stock: com. auth. \$850,000, issued \$492,100; pref. auth. \$150,000, issued \$77,000. Wm. Renshaw, P.; W. W. Renshaw, A. T.; at Chicago, Ill. Lawrence Fitch, V. P.; F. J. O'Brien, V. P. & G. M.; Grant Fitch, T.; at Milwaukee.

Sales offices: Chicago, Peoples Gas Bldg.; Detroit, Book Bldg.; New York, 30 Church St.

Works at 33rd Ave. & Burnham St., Milwaukee: blt. 1910, f. o. Feb., 1911; 12 heat. fur.; 2 piercing mills; 8 stands of 20" rolls.

Product: rolled blanks for own use; hot rolled (2½" to 4" O. D.) and cold drawn (½" to 4" O. D.) steel tubing; annual cap., 36,000 tons.

GLOVER MACHINE WORKS, Inc., Marietta, Ga.

J. W. Glover, P.

Works at Marietta, Georgia: one 2½-ton Gronwall-Dixon electric fur., added 1918.

Product: steel castings, annual cap., 2,000 tons.

Godcharles (F. A.) Co., Milton, Pa., see 1916 Directory, p. 152. Milton Nail Works acquired by Milton Manufacturing Co., May, 1915. Operated as East End Puddle Mill in 1916 by W. B. Godcharles; acquired by W. B. Godcharles in Oct., 1917.

Goldschmidt Thermit Corporation, see Metal & Thermit Corporation.

Goshen Iron Co. (The), see 1916 Directory, p. 152. Victoria Furnace at Goshen, Va., was sold to the Southeastern Iron Corp., June 1, 1917.

GOULD COUPLER CO., 30 East 42nd St., New York.

Inc. 1903 in New York. Capital stock: com. \$5,000,000.

Charles A. Gould, P.; Eugene Gray, Sc.; W. J. Armstrong, A. T.; at New York. B. Miller, A.; B. H. Eden, G. S.; G. W. Wenz, P. A.; at Depew, N. Y.

Sales office: Dr. C. W. Gould, The Rookery, Chicago.

Works at Depew, N. Y.: blt. 1903; f. o. Nov. 30, 1903; 4 annealing fur.; 4 Wellman B. O. H. fur. (25-ton). Fuel, oil and prod. gas. Company also operates a malleable casting plant at Depew.

Product: steel castings for sale and for own use, car and locomotive castings, malleable iron castings; annual cap., steel castings 50,000 tons malleable castings 15,000 tons.

Grand Crossing Tack Co., Chicago, Ill., see 1916 Directory, p. 153, was sold to Interstate Iron & Steel Co., in Dec., 1916.

Grand Rivers Furnaces, Grand Rivers, Ky., see 1908 Directory, p. 334. The Hillman Land & Iron Co., sold two blast furnaces, long idle and considered as abandoned, to Suwanee Iron Co., Grand Rivers, Ky., March, 1917.

GRAND TRUNK RAILWAY SYSTEM, Montreal, P. Q., Canada.

W. H. Sample, Gen'l Supt., Motive Power and Car Dept.

Works at Point St. Charles, Montreal: blt. 1891-92; f. o. May 9, 1892; two 3-d. heat. fur.; 12" 3-h. 4-st. bar mill. Foundry with annual cap. of 5,950 tons gray iron castings. Forge shop for locomotive forgings. Fuel, bit. coal.

Product: merchant bar for own use; annual cap., 7,000 tons.

GRAY, J. J., Jr., Rockdale, Tenn.

Selling agents: Hickman, Williams & Co.

Brand: "Rockdale."

Rockdale Furnace, Rockdale, Tenn.: 1 stack, 55' x 12' 6", blt. 1890, idle 1898-1902, revived 1902; 4 White & Kernan stoves, 60' x 16'; 2 steam blowing eng.; 3 boilers (2 water-tube, 1 cylindrical), 875 H. P.; slag granulating pit, annual cap., 25,000 tons. Coke: local brown ore. Company owns iron ore mine at Iron City, Tenn.

Product: ferro-phosphorus, annual cap., 12,000 tons.

GREAT NORTHERN RAILROAD, St. Cloud, Minn.

Works at St. Cloud: rolling mill, f. o. July 10, 1912; two 3-d. heat. fur.; 12" 3-h. 3-st. merchant mill. Fuel, oil.

Product: merchant bars for own use; annual cap., 3,800 tons.

GRIFFITHS CHARCOAL IRON MILLS, Washington, Pa.

Inc. Nov. 14, 1901 in Pennsylvania. Capital stock: com. \$200,000. William H. Griffiths, P., G. M., G. S. M., G. S. & P. A.; N. R. Baker, Sec. & T.; at Washington, Pa. J. A. Scott, V. P.; at Stanton Ave., Pittsburgh.

Works at Washington, Pa.: 6 knobbling fires; 1 hammer (6,000-lb.); one 3-d., heat. fur.; 24" 2-h. 1-st. sheet bar mill; 26" x 38" black sheet mill; 26" x 32" tin mill; 2 cold mills (22" x 34"); 2 box annealing fur.; one Mesta pickling mach.; 3 tinning pots for terne plates. Fuel, coal and charcoal.

Product: hammered charcoal iron blooms for own use; sheet and tinplate bars, iron black plates for tinning; iron terne plates; annual cap., charcoal iron blooms, 5,625 tons; sheets 3,500 tons and black plates 2,900 tons; terne plates 51,000 boxes.

GULF STATES STEEL CO., Brown-Marx Bldg., Birmingham, Ala.

Inc. Nov. 1, 1913 in Delaware. Capital stock: com. auth. \$11,500,000, issued \$11,136,550; first pref. 7% cum. auth. \$3,000,000, issued \$2,000,000; second pref. 6% non-cum. auth. \$1,085,700, issued \$85,700; underlying bonds \$201,000.

James Bowron, P.; H. Sanborn Smith, V. P.; C. A. Moffett, V. P. & G. M.; A. R. Forsyth, V. P. & T.; W. H. Moore, Sec. & A.; L. E. Geohegan, A. G. M.; C. C. Brown, G. S. M.; B. F. Tyler, P. A.; at Birmingham. Calvert Brewer, A. Sc. & A. T.; at 55 Cedar St., New York City.

Alabama City Works, Alabama City, Ala.: Alabama City Furnace, 1 stack, 90' x 19' 3", blt. 1902-03, f. o. Jan. 17, 1904, remod. 1905-06, relined 1918; 4 hot blast stoves 4-pass 100' x 20'; 4 steam blowing eng. (50,000 cfm.); 11 water-tube boilers, 4,125 H. P.; 1 Heyl & Patterson single-strand casting machine. By-product coke: Alabama red ore. Molten metal to O. H. fur. Product: basic and foundry pig iron, annual cap., 100,000 tons.

By-product Coke Plant: blt. 1916-17, f. o. April, 1917; 37 Koppers ovens, annual cap., 164,000 net tons coke; by-product recovery and Koppers benzol plant (annual cap., 375,000 gals. light oil).

Steel Works: blt. 1903-04, f. o. June 24, 1904; 6 B. O. H. fur. (50-ton); four 4-hole soaking pits; 36" 2-h. 1-st. reversing blooming; Garrett-Cromwell cont. rod mill with 18 st.; 20" 3-h. 3-st. and 12" 3-h. 4-st. merchant bar mills; 4 prod. gas-fired reheate. fur.; 200 wire drawing blocks, wire No. 2 to No. 18 gage; 3 galvanizing pans; 123 wire nail mach., all sizes from 10" spike down; 70 barbed wire mach.; 13 wire fence mach. Fuel, coal and prod. gas. Product: ingots, blooms, billets, wire rods, merchant bars, and tie plates; plain and galvanized wire, wire nails and spikes, barbed wire and wire fencing. Annual cap., 288,000 tons ingots, 250,000 tons billets, 50,000 tons bars, tie plates, etc.; 108,000 tons wire rods, 75,000 net tons plain wire, 40,000 tons galvanized wire, 600,000 kegs wire nails, 25,000 net tons barbed wire, 18,000 net tons wire fencing.

The company owns 4,600 acres of iron ore lands at Gaylesville, 800 acres at Porterville, and 1,600 acres at Shannon, Ala. Company is sinking slope at Shannon. The company owns 4,200 acres of coal lands at Virginia, 4,000 acres at Altoona, and 15,000 acres at Sayre, Ala. Annual cap. of coal mines about 700,000 tons of coal. The company owns 300 beehive coke ovens at Virginia and 150 beehive coke ovens at Sayre, annual cap., 225,000 net tons of coke.

HALCOMB STEEL CO., Syracuse, N. Y.

Inc. Jan. 16, 1905 in New York. Capital stock: pref. \$5,000,000.
 John A. Mathews, P.; H. A. Pardee, V. P. & G. M.; W. A.
 Mackenzie, Sc.; F. M. Barnes, T.; A. T. Galbraith, G. S. M.;
 R. H. Filsinger, P. A.

Sales offices:

Boston, Hawkrider Bros. Co., 303 Congress St.
 Chicago, M. P. Spencer, 608 West Adams St.
 Cleveland, J. F. Kirwan, 1274 Ontario St.
 Detroit, Arthur Schroeder, 82 East Fort St.
 New York, F. W. Ross, 401-3 Canal St.
 Philadelphia, Thomas J. Moore, Jr., 633 Arch St.

Works at Syracuse: blt. 1905-06; f. o. 1906; one 20-ton B. O. H.,
 fur. used for melting stock for electric fur.; 6 electric fur.
 (4 Heroult, one 4-ton, three 6-ton; 2 Greaves-Etchells, 3-ton);
 four 24-pot crucible fur.; 38 heat. fur. (seven 1-d., sixteen 2-d.,
 eleven 3-d., four 4-d.); 9 gas producers; 5 bar mills (24" 3-h. 1-st.,
 14" 3-h. 5-st., 12" 3-h. 8-st., 12" 3-h. 6-st., 9" 3-h. 8-st.); 1 rod
 mill 2 and 3-h. with 18" 1-st., 10" 6-st., 9" 5-st.; 6 cold rolls (10"
 x 15", two 8" x 6", 6" x 6", 10" x 6" and 8" x 4½"); four sheet
 mills (18" x 26" to 36"); 20 annealing fur. (11 bar, 9 wire); 6
 pickling vats, 17 hand pickling tanks; 90 wire drawing blocks,
 86 coil, 4 bar; annual cap., 4,500 tons, from .013" wire to 3" bars;
 8 steam hammers (600-lb. to 6-ton); 1 hydraulic forging press
 (650-ton). Fuel, coal and prod. gas.

Product: steel ingots; nickel, chrome and vanadium alloy steel
 ingots; carbon, alloy and high speed tool steel; hammered and
 rolled bars; sheets, forgings, fine wire, drill rods, drawn shapes,
 cold rolled bars and strip; spring, cutlery, hack saw and high
 grade tool steel; annual cap., 32,500 tons electric ingots, 6,000 tons
 crucible ingots, 25,000 tons rolled and forged products.

HAMILTON FURNACE CO. (The), Hamilton, Ohio.

Inc. 1917 in Ohio. Capital stock: com. auth. \$400,000.
 John A. Savage, P.; H. S. Munro, Sc. & A.; A. S. Trux, T.; at
 Duluth, Minn. Joseph Savage, V. P.; A. E. Gillispie, S.; C. H.
 Henneberger, P. A.; at Hamilton. Fayette Brown, V. P; at
 Cleveland, Ohio.

Furnace at Hamilton, Ohio: 1 stack, 85' x 20', blt. 1907-8, f. o.
 Aug. 22, 1908; remod. 1918; relined 1919; 4 Kennedy stoves
 (three 90' x 20', one 100' x 20'); 2 steam blowing eng. (40,000
 cfm.); 5 water-tube boilers 2,500 H. P.; 1 Uehling double-strand
 pig casting machine. Coke: Lake ore. (Formerly owned by

The Miami Iron & Steel Co., acquired by The Hamilton Furnace Co., Mar. 22, 1917).

Product: basic, malleable and foundry pig iron; annual cap., 175,000 tons.

HAMMOND STEEL CO., Inc. (The), 2600 Milton Ave., Syracuse, N. Y.

Inc. 1912 in New York. Capital stock: com. auth. \$1,000,000, issued \$677,500; pref. auth. \$750,000; bonds \$600,000.

Frederick B. Scott, P.; Alexander MacInnes, V. P. & G. S. M.; Percy Ridings, T.; Stewart F. Hancock, Sc.; Walter H. Scott, G. M.; S. M. Anderson, A. T. & A.; Henry Thomsen, G. S.; Charles B. Post, P. A.

Sales offices.

Buffalo, O. W. Mueller, 792 Ellicott Sq.

Chicago, Dickson & Happer, Manhattan Bldg.

Cleveland, E. W. Saunders, 317 Bank of Lake Erie Bldg.

Detroit, S. M. Wetmore, 207 Scherer Bldg.

New York, Dickey Steel Co., Woolworth Bldg.

Export sales agent: Dickey Steel Co., Woolworth Bldg.

Works at Solvay, N. Y.: blt. 1912; 2 electric fur. (one 10-ton Ludlum, one 3-ton Greaves-Etchells) first electric steel made March, 1918; 16 heat. fur. (six 4-d., two 3-d., seven 2-d., one 1-d.); 10 annealing and heat treating fur.; 16" 4-st. and 10" 5-st. bar mills; 8 steam ham. (400-lb. to 3-ton); one 1,000-ton hydraulic press; rough turning equipment, straightening mach., shears, etc.

Product: carbon and alloy steel ingots and billets; pressed, hammered or rolled steel bars in rounds, squares or flats; hammered die blocks, die block bars, crank shafts, connecting rods, weldless rings and special forgings. Annual cap., 12,000 tons ingots, 15,000 tons rolled products, 6,000 tons forged products.

HANGING ROCK IRON CO. (The), Hanging Rock, Ohio.

Inc. April 6, 1900 in Ohio. Capital stock: com. \$450,000.

D. B. Meacham, P.; J. K. Pollock, V. P.; H. C. Lammers, T.; at Carew Bldg., Cincinnati, Ohio. H. E. Frazier, Sc.; W. M. Jeffreys, P. A.; at Hanging Rock.

Selling agents: Rogers Brown & Co., Cincinnati, Ohio.

Brand: "Hamilton."

Hamilton Furnace, Hanging Rock: 1 stack, 65' x 16'; blt. 1883, f. o. Mar., 1886, relined 1918; 4 Foote hot blast stoves (two 85' x 18', two 75' x 18'); 3 blowing eng. (40,000 cfm.); 5 water-tube boilers, 1,750 H. P. By-product coke: Lake ore.

Product: foundry, malleable and basic pig iron; annual cap., 60,000 tons.

HARRISBURG PIPE & PIPE BENDING CO., Harrisburg, Pa.

Inc. Dec. 28, 1899 in Pennsylvania. Capital stock: com. auth. \$1,000,000, issued \$911,500; pref. 7% cum. auth. \$150,000, issued \$97,100; bonds \$1,100,000.

A. K. Barker, P.; E. C. Smith, V. P. & G. S.; N. W. Cassel, Sc.; E. C. Frey, T.

Brand: "Harrisburg P. & P. B. Co."

Works at Harrisburg: blt. 1900; O. H. plant and rolling mill added 1902-03; first steel made Aug. 5, 1903; first products rolled Jan., 1904; 3 B. O. H. fur. (40-ton); two 2-d. and 2 cont. regenerative billet and slab heat. fur.; 32" 2-h. 1-st. reversing blooming, 21" 3-h. 1-st. universal plate, 17" 3-h. 1-st. direct mill; 3 small ham.; 6 forging presses (50 to 500-ton). Fuel, prod. gas for heat. fur. and fuel oil for O. H. Departments for the manufacture of iron, brass, and copper coils, feedwater heaters, freezing plates, seamless steel cylinders for high pressure gases and shrapnel case forgings. Machine shop for own use.

Product: steel ingots, slabs, billets, skelp, and universal plates, 4" to 18" wide, down to 16 gage. Annual cap., from 60,000 to 75,000 tons of ingots, and 60,000 tons of rolled material.

Harrison Steel Casting Co., Murphysboro, Ill. This company began construction of a plant at Murphysboro, Jan. 1, 1917. On Jan. 1, 1918, the National Car Coupler Co. leased the plant for five years and now operates it. Plant was completed ready for operation on May 30, 1918.

HARROW SPRING CO., Kalamazoo, Mich.

Inc. July 11, 1900. Capital stock: auth. \$600,000, issued \$560,050. H. J. Schlesinger, P.; C. N. Turner, V. P. & G. S. M.; M. T. MacLaren, 2 V. P.; Wilmot Saeger, Sc.; H. H. Springford, T. & A.; J. P. McGuigan, P. A.; W. W. Gregg, Works M. Subsidiary of Steel & Tube Company of America since June 30, 1919.

Works at Kalamazoo, Mich.: blt. 1900-01, f. o. Jan. 30, 1901; one 6-ton Heroult electric fur.; 3 ingot rehear. fur.; two 4-d. heat. fur.; 24" 3-h. 2-st. billet; 16" 3-h. 3-st. and 9" 3-h. 5-st. Belgian tandem guide; 500-ton hydraulic forging press. Fuel, bit. coal. Shop for manufacture of springs, car fenders, track scrapers, agricultural implements; harrow, rake and cultivator teeth. Product and annual cap.: 7,000 tons steel ingots; alloy steel ingots; 36,000 tons merchant bars and forging billets, 7,000 tons forged billets and slabs.

HARTFORD ELECTRIC STEEL CORPORATION (The), Rocky Hill, Conn.

Inc. May 31, 1917 in Connecticut. Capital stock: com. auth. \$250,000, issued \$213,000.

William R. Palmer, P.; F. C. Shepard, A.; Reed L. Palmer, G. M.; at Rocky Hill. M. Suisman, V. P.; William E. Egan, Sc.; H. S. Blumenthal, T.; at Hartford, Conn.

Works at Rocky Hill: blt. 1917-18; f. o. Mar., 1918; one 3-ton Gronwall-Dixon electric fur.

Product: electric steel ingots and castings for sale; annual cap., 3,000 tons.

HART-PARR CO., Charles City, Iowa.

Inc. July 24, 1912 in Iowa. Capital stock: com. \$1,000,000; pref. 7% cum. \$1,500,000.

C. D. Ellis, P.; M. W. Ellis, V. P. & G. M.; A. H. Witt, Sec. & A. T.; D. L. Mills, A.; R. C. Roling, G. S.; W. S. Fredrickson, G. S. M.; F. S. Spear, P. A.

Sales offices:

Dallas, Texas, O. A. Lohrke.

Grand Forks, N. D., A. E. Mills.

Great Falls, Mont., H. H. Boettger.

Memphis, Tenn., F. McGuckin.

Regina, Sask., Canada, J. C. Desmond.

Works at Charles City: blt. 1901; first O. H. steel made April 6, 1911; 2 B. O. H. fur. (10-ton); one 2-ton Whiting converter; 2 cupolas. Gray iron and semi-steel (15,000 tons) and brass and bronze (110 tons) foundry.

Product: steel castings for own use and for sale, annual cap., 11,000 tons (8,000 tons O. H., 3,000 tons converter).

HELGERSON FOUNDRY CO., 1148 Main St., Green Bay, Wis.

Inc. July 22, 1919 in Wisconsin. Capital stock: com. auth. \$100,000, issued \$60,000.

A. Helgerson, P. & G. S.; A. L. Cannard, Sec.; at Green Bay. A. W. Gregg, V. P.; at Harvey, Ill.

Works at 1148 Main St., Green Bay: building one 1-ton Whiting converter, construction begun Nov., 1919, completed and f. o. April 6, 1920; 2 cupolas, gray iron and semi-steel foundry.

Product: steel castings for sale, annual cap., 1,200 tons; gray iron castings, 1,200 tons; semi-steel castings, 300 tons.

HELLER BROTHERS CO., 865 Mt. Prospect Ave., Newark, N. J.

Est. 1836; inc. 1899 in New Jersey. Capital stock: com. auth. \$500,000, issued \$498,000; pref. 7% cum. auth. \$200,000, issued \$194,700.

Paul E. Heller, P.; Arnaud G. Heller, V. P., Sec. & G. S. M.; Ernest A. Geoffroy, T. & G. M.; Charles Ten Eyck, A.; Edward Davies, G. S.; Fred Stout, P. A.

Works at Newark: crucible steel works blt. 1882; one 30-pot crucible fur.; 12 heat. fur. (two 1-d., eight 2-d., two 3-d.); 2 gas producers; 16" 3-h. 1-st. cogging; 10" 3-h. 7-st. finishing bar; 2 box annealing fur.; 5 steam hammers, 500-lb. to 2½-ton. Fuel, bit. coal and prod. gas.

Product: steel ingots; nickel, chrome and tungsten alloy steel ingots; bar steel for own use; annual cap., ingots, 1,500 tons; rolled products, 5,000 tons; forged products, 1,000 tons. Horse rasps, files, farriers tools and tool steel.

HEMPFIELD FOUNDRIES CO., 35th & Charlotte Sts., Pittsburgh, Pa.

Inc. July 20, 1907 in Pennsylvania. Capital stock: com. \$100,000.
 George H. Danner, P.; Charles R. Rall, V. P. & T.; H. M. Meixner,
 Sc.; W. R. Neely, G. S. M.; K. F. Tiegel, P. A.; at Pittsburgh.
 William Bachman, G. S.; at Greensburg, Pa.

Works at Greensburg, Pa.: blt. 1913; 1 Whiting converter (2-ton);
 f. o. 1917; 2 cupolas. Fuel, gas and coal.

Product: steel castings for sale; valves, pipe fittings, flanges; gray
 iron and semi-steel flanged pipe fittings, flanges, mine castings,
 wheels, sheaves, etc.; annual cap., steel castings, 800 tons; gray
 iron and semi-steel castings, 2,300 tons.

HENDERSON (The W. K.) IRON WORKS & SUPPLY CO., Ltd., Shreveport, La.

Inc. Jan. 30, 1903 in Louisiana. Capital stock: com. \$300,000.
 W. K. Henderson, P.; W. P. Fort, V. P.; A. B. Boazman, Sc.;
 J. C. Henderson, T.

Works at Spring, Caddo & Commerce Sts., Shreveport: one 1-ton
 Industrial electric fur.; 2 cupolas, gray iron and brass foundry.

Product: steel castings for own use, annual cap., 400 tons; gray iron
 (1,500 tons) and brass (10 tons) castings.

HEPPENSTALL FORGE & KNIFE CO., 4620 Hatfield St., Pittsburgh, Pa.

Inc. Mar. 19, 1890 in Pennsylvania. Capital stock: com. auth.
 \$300,000, issued \$249,000.

Sam Heppenstall, P.; H. P. Kuhn, V. P.; W. H. Lewis, V. P.
 & G. S. M.; Floyd Rose, Sc.; C. W. Heppenstall, T. & G. M.

Sales offices:

Boston, H. P. Jones, 200 Devonshire St.

Chicago, T. P. Wallace, Monadnock Bldg.

Cleveland, George I. Allen, Rockefeller Bldg.

Detroit, E. H. Graham, West Jefferson Ave. (Warehouse).

Milwaukee, Fred H. Koch, Milwaukee National Bank Bldg.

New York, Edward Laterman, 30 Church St.

Philadelphia, Robert M. Ray, Bourse Bldg.

Seattle, George F. Thompson Co., Central Bldg.

Syracuse, J. D. Weeks, 704 Keith Bldg.

Works at Hatfield St.: 2 Heroult electric fur. (6-ton); blt. 1917;
 f. o. Sept., 1917; 2 steam hammers (1-ton, 2-ton); 3 hydraulic
 forging presses (500-ton, 1,000-ton and 1,500-ton). Electric fur-
 naces idle, annual cap., 12,000 tons. One 25-ton B. O. H. fur.,
 annual cap., 18,000 tons ingots, completed Mar., 17, 1920.

Product: engine and ship forgings, die blocks, bit and jar steel,
 shear knives; annual cap., forged products, 18,000 tons.

Hercules Forge Co., Indianapolis, Ind., see 1916 Directory, p. 159;
 was purchased by Chas. F. Downey, J. W. Wilford and H. C.

Shields, July, 1916 and operated under the name of the Downey-Wilford-Shields Co. It was sold Dec., 1917 to Imperial Drop Forge Co., Indianapolis, Ind. Make forgings only.

HERCULES MANUFACTURING CO., Centerville, Iowa.

Inc. June, 1912. Capital stock: com. auth. \$200,000, issued \$125,000.

B. A. Fuller, P., T. & G. M.; Miles Bateman, V. P.; C. D. Cook, Sc.

Works at Centerville: blt. 1912, f. o. Mar. 16, 1912; crucible steel fur. dismantled in 1918; side blown converter (1-ton).

Product: steel castings for sale, annual cap., 1,600 tons.

HERCULES STEEL CASTING CO., 871-891 Robinson Ave., Milwaukee, Wis.

Inc. Feb. 1, 1917 in Wisconsin. Capital stock: com. \$125,000; pref. 7% cum. auth. \$175,000, issued \$125,000.

Joseph Ewens, P. & P. A.; J. J. McGovern, V. P.; E. B. Gennrich, Sc., T. & G. S. M.; A. H. Fischer, A.; F. A. McIntyre, G. M. & G. S.

Works at 871-891 Robinson Ave., Milwaukee: blt. 1918-19; f. o. Feb. 1, 1919; 1 Vom Bauer electric fur. (8-ton).

Product: steel castings (1-lb. to 8-ton) for sale; gears; annual cap., 1,500 tons.

Hess Steel Co. (The), Baltimore, Md., see 1916 Directory, p. 160.

Works at Bridgeton, N. J. sold to Salem Brass & Iron Manufacturing Co., July 17, 1916 and steel furnaces dismantled.

HESS STEEL CORPORATION (The), Baltimore, Md.

Inc. Nov., 1915 in Maryland. Capital stock: com. auth. \$1,000,000, issued \$900,000; 1st. pref. 8% cum. \$300,000; 2nd pref. 7% non-cum. auth. \$500,000, issued \$125,000; bonds \$400,000.

Henry Hess, P.; at Philadelphia, Pa. H. L. Hess, 1 V. P. & Sc.; E. Von Maltitz, 2 V. P.; Eugene Levering, T.; J. J. Quinn, A. Sc. & A. T.; A. V. Farr, G. S. M.; at Baltimore.

Works at Baltimore, Penna. R. R. & East Ave.: blt. 1916; 6 Heroult electric fur. (two 6-ton, four 7-ton); two 3-d. heat. fur.; 9" 3-h. 6-st. bar and rod; 20" 3-h. 3-st. bar. Fuel, coal.

Product: ingots, billets, bars, rounds, flats, etc.; carbon and alloy tool steels. Annual cap., 30,000 tons ingots and 22,000 tons rolled products.

HEWITT STEEL CORPORATION, Chapel St., Newark, N. J.

R. E. Jennings, 2nd., V. P. & G. M.

Works, foot of Chapel St., Newark (leased; owned by The Titan Co.): blt. 1901; 3 B. O. H. fur. (25-ton); 1 A. O. H. fur. (25-ton).

Product: steel castings for railroad equipment, side frames, bolsters, etc., annual cap., 40,000 tons (30,000 basic, 10,000 acid.)

Heyward Steel Co., Pittsburgh, Pa., organized 1918 to take over the steel plant at New Cumberland, W. Va., of the National Steel Casting Co. This plant was sold to the Amalgamated Machinery Corp., Chicago, Ill., in 1918 and purchased by T. R. Heyward, Jr., Aug., 1919.

HEYWARD, THOMAS R., Jr., Pittsburgh, Pa.

Works at New Cumberland, W. Va.: blt. 1916; one 20-ton A. O. H. fur. Fuel, coal and oil. (Formerly owned by National Steel Casting Co.; acquired by Thomas R. Heyward, Jr., in Aug., 1919).
Product: steel castings, annual cap., 10,000 tons.

HIGHLAND IRON & STEEL CO. (The), Terre Haute, Indiana.
Inc. Feb. 26, 1901 in Indiana. Capital stock: com. \$300,000.
Subsidiary of the American Chain Co.

Walter B. Lashar, P.; Wilmot F. Wheeler, T.; at Bridgeport, Conn.
William T. Morris, V. P.; at New York City. William M. Myers, Sc.; Walter C. Ely, V. P., G. M., G. S. M. & P. A.; at Terre Haute.

Sales offices:

Chicago, E. J. Murray, 123rd St. & Ashland Ave.
Louisville, R. M. Kelley, Jr., Courier-Journal Bldg.
St. Louis, J. I. Swan, 1418 Pierce Bldg.
St. Paul, Rank & Goodell, 906 Merchants Bank bldg.

Product: scrap bar, muck bar, iron and steel merchant bars, and special shapes.

Terre Haute Works, Terre Haute, Ind.: blt. 1901; f. o. Nov. 25, 1901; 1 double puddling fur. and 6 mechanical busheling fur.; five 4-d. heat. fur.; 20" 3-h. 2-st. puddle, 20" bar mill with 1-st. 2-h. and 2-st., 3-h.; 1 comb. 10" and 12" guide mill with 12" 3-h. 1-st. Belgian roughing, 10" 3-h. 4-st. and 10" 2-h. 1-st. finishing. Fuel, bit. coal. Product: iron and steel merchant bars and special shapes; annual cap., 50,000 tons.

West Pullman Works, 123rd St. & Ashland Ave., Chicago, Ill.: blt. 1909, f. o. Sept. 11, 1909; 2 pile fur., 2 busheling fur.; four 4-d. heat. fur., 2 double puddling fur.; 10 shears; 10" guide mill with 4-st. 3-h. and 1-st. 2-h.; 18" 3-h. 2-st. bar; 20" puddle mill with 2-st. 3-h., 1-st. 2-h. Fuel, bituminous coal. Machine shop for own use. Product: scrap bar, 1/2" to 4" iron rounds and squares, 1/2" to 12" iron flats. Annual cap., 25,000 tons of scrap bar and 40,000 tons iron merchant bars.

HIGH SPEED TOOLSCORPORATION, 489 Fifth Ave., New York, N.Y.
Inc. Dec. 2, 1916 in New York. Subsidiary of United States High Speed Steel & Tool Corporation since Oct. 15, 1919.
Jean Wolkenstein, P.; at 489 Fifth Ave., New York. Lawrence J. Ollesheimer, Sc.; at 18 Broadway, Toledo, Ohio.

Works at 18 Broadway, Toledo, Ohio: f. o. Dec. 1916; three 6-pot crucible fur. Fuel, gas, oil and coal. Machine shop for finishing cast tools.

Product: steel ingots and castings, cast high speed tool steel; annual cap., 300 tons. High speed tools, dies, milling cutters, large drills, and reamers.

Hillman Land & Iron Co., Hematite, Ky., see 1916 Directory, p. 161, Centre Furnace at Hematite abandoned in 1917.

HIRSCH ROLLING MILL CO., 6800 Manchester Ave., St. Louis, Mo.

Inc. 1900. Capital stock: com. \$225,000.

Marcus A. Hirsch, P., T. & G. M.; V. R. Hirsch, V. P.; Cal. R. Hirsch, Sc.

Works at Ecoff Ave. and Mo. Pac. R. R., St. Louis: blt. 1900; f. o. July 5, 1900; 7 heat. fur. (three 3-d., four 4-d.); 2 forge fires; 18" 3-h. 3-st. muck; 18" 3-h. 4-st. finishing; 10" to 8" 3-h. 7-st. Belgian; 2 spike mach. Bolt and nut dept.

Product: merchant bars, concrete bars, light rails, angles, shapes, spikes and bolts.

HOOPES & TOWNSEND CO., 1330 Buttonwood St., Philadelphia, Pa.

Est. 1849; inc. June 13, 1899 in New Jersey. Capital stock: com. auth. \$1,000,000.

Clement R. Hoopes, P.; Barton Hoopes, Jr., V. P.; Albert B. Marks, Sc.; John M. Zook, T.; J. A. Frazer, A.; John H. Townsend, G. S.; S. V. Mulholland, P. A.

Works at Fort Washington, Pa.: 3 puddling fur. (1 single, 2 double); busheling fur.; 1 squeezer; four 3-d. heat. fur.; 20" 3-h. 2-st. muck; 12" 3-h. 5-st. and 9" 3-h. 5-st. finishing mills.

Product: merchant bar iron and steel; bolt, nut and rivet rods for own use; annual cap., 7,200 tons muck and scrap bar, 10,000 tons merchant bars.

HOOSIER ROLLING MILL CO., Terre Haute, Ind.

Inc. May 7, 1917 in Indiana; reinc. April, 1919 in Delaware. Capital stock: com. \$100,000; to be increased to \$2,000,000 pref. and \$2,000,000 com.

J. R. Finkelstein, P., G. M. & P. A.; W. M. Lewis, 1 V. P. & G. S.; C. J. Bennett, 2 V. P.; M. F. Downs, 3 V. P.; at Terre Haute. L. M. Stafford, 4 V. P.; W. M. Kayser, Sc. & T.; Charles F. Hanley, A.; at Bowling Green, Ind. O. C. Steen, G. S. M.; at McCormick Bldg., Chicago.

Sales agents: Chicago, McCormick Bldg.; Detroit, General Steel Products Co., Dime Bank Bldg.

Works at Terre Haute: 2 heat. fur. (one 4-d. coal, 1 cont. gas.); 12" 3-h. 5-st. bar mill; building 22" 3-h. bar mill, plan for 4 B. O. H. fur., soaking pits and blooming mill.

Product: merchant bar iron and steel, light rails, structural, etc.; annual cap., 36,000 tons.

Howe & Samuel, Inc., Harrison Bldg., Philadelphia, Pa., see 1916 Directory, p. 162; succeeded by American-Swedo Iron Co. in 1918.

Hubbard, John W. (Owner), Granite Bldg., Pittsburgh, Pa.

West End Furnace, Roanoke, Va.: 1 stack, 82' x 16', blt. 1890, f. o. Dec. 1, 1890; 4 Massicks & Crooke stoves; 2 steam blowing eng. (23,000 cfm.); 14 flue boilers, 700 H. P. Pocahontas coke: local brown hematite ore. Limestone quarries near Buchanan, Va. (Formerly owned by David W. Flickwir; acquired by John W. Hubbard, April 20, 1917; and leased to Old Dominion Pig Iron Corp., May 11, 1917 to Dec. 31, 1919). *For sale or lease.*

Product: foundry pig iron, annual cap., 48,000 tons; or spiegeleisen, 24,000 tons.

HUBBARD STEEL FOUNDRY CO., East Chicago, Ind.

Inc. Dec., 1918 in Delaware. Capital stock: com. \$1,000,000.

Albert Pack, P.; W. J. Gilmore, V. P.; F. G. Becker, Sc. & T.

Sales offices: Chicago, 1450 McCormick Bldg.; Pittsburgh, 2147 Oliver Bldg.

Works at East Chicago: blt. 1910; f. o. Aug. 26, 1910; 3 A. O. H. fur. (35-ton, 25-ton and 8-ton); 1 Snyder electric fur. (3-ton). Fuel, oil. Roll foundry with 3 air fur.

Product: steel castings for sale; annual cap., 25,200 tons open hearth castings, 5,400 tons electric. Chilled and sand iron rolls; annual cap., 10,000 tons.

HUB ELECTRIC STEEL CASTING CO., 387 W. First St., South Boston, Mass.

Electric steel castings for sale: alloy steel castings; cap 1,200 tons.

HUDSON REDUCTION CO., Latrobe, Pa. (Partnership).

Capital stock: \$90,000.

I. B. Shallenberger, Sc. & T.; Frank Garratt, G. M.; W. W. Clark, G. S.; at Latrobe. W. A. Bonitz, G. S. M.; at Empire Bldg., Pittsburgh, Pa.

Works at Latrobe, Pa.: 20 special electric furnaces; f. o. April, 1916. Electric power from West Penn Power Co., Connellsville, Pa.

Product: ferro-tungsten, tungsten metal and ferro-molybdenum; annual cap., 800 tons.

HUDSON SHEET & TINPLATE CO., Marietta, Ohio.

Inc. 1917 in New York. Capital stock: com. auth \$300,000, issued \$150,000; pref. 7% non-cum. auth. \$1,000,000, issued \$500,000.

George W. York, P.; J. H. Macleod, Jr., Sc. & T.; at 215 Cuyahoga Bldg., Cleveland, Ohio. R. R. Beachler, G. M. & P. A.; W. G. Brangham, G. S.; at Marietta. Lawrence Hamill, G. S. M.; at Hickox Bldg., Cleveland.

Selling agent: Hamill-Hickox Co., Hickox Bldg., Cleveland.

Works at Marietta, Ohio: blt. 1918; six 2-d. heat fur.; 6 hot tin mills

(38"); 4 cold mills (38") 2 trains of 2-st. each; 2 double box annealing fur.; 1 Mesta pickling machine; 10 tinning pots. Fuel, nat. gas. Product: black plates for tinning, annual cap., 25,000 tons; tinplates, 450,000 base boxes.

HUGHES & PATTERSON, 800 Richmond St., Philadelphia, Pa.

Robert J. Hughes and William H. Hughes (partners).

Brand: "H. & P. Best," "H. & P. Best-best," "H. & P. Staybolt."

Delaware Rolling Mill at Richmond St. and Susquehanna Ave.: blt. 1870; 10 single puddling fur.; 2 rotary squeezers; 6 heat. fur. (three 2-d. and three 3-d.); 18" 3-h. 2-st. muck, 18" 3-h. 1-st. muck, two 10" 3-h. 4-st. and one 8" 3-h. 4-st. finishing. Fuel, bit. coal. Product: bar iron specialties, bands, hoops and rods; annual cap., 15,000 tons.

HULL IRON & STEEL FOUNDRIES, Ltd. (The), Hull, P. Q., Canada.

Inc. Oct. 30, 1913 in Canada. Capital stock: com. auth. \$190,000, issued \$154,500; pref. 7% cum. auth. \$60,000, issued \$57,200.

Archibald H. Coplan, P. & G. M.; O. Pullan, Sc. & T.; F. H. Cross, D. & A. M.; A. Baillot, G. S.; E. C. Brady, S.; F. Palen, P. A.

Works at Hull: blt. 1913-14; f. o. April 22, 1914; 2 side blow converters (4,500-lb.); 1 A. O. H. fur. (16-ton); 1 Hull electric fur. (6-ton). Fuel, coke. (O. H. fur. idle; electric fur. run on pig iron).

Product: chrome steel ingots, steel castings for own use and for sale; manganese, chrome and nickel alloy steel castings; steel lining plates for tube and ball mills, shoes and dies for stamp mills, manganese steel parts for crushing machinery, dredges, etc.; annual cap., 6,000 tons converter castings, 6,000 tons of low-phosphorus pig iron from scrap.

HUNTINGTON STEEL FOUNDRY CO., Huntington, Ind.

Inc. Mar. 30, 1916. Capital stock: com. auth. \$175,000, issued \$113,000; pref. 7% cum. auth. \$50,000, issued \$37,000.

A. L. White, P.; J. W. Caswell, 1 V. P.; E. G. Rowlands, 2 V. P. & G. M.; M. W. Manz, 3 V. P.; A. T. Gardiner, Sc.; L. R. Wright, T.

Works at Huntington: blt. 1916, f. o. June 21, 1916; two 2-ton Whiting converters; 2 cupolas; one 4½-ton Gronwall-Dixon electric fur., electric steel first made May, 1918.

Product: steel castings for sale, small steel castings for automobiles, trucks and railway cars. Annual cap., 3,200 tons converter and 2,700 tons electric steel castings; gray iron castings, 1,500 tons.

HURT, JOEL, Hurt Bldg., Atlanta, Ga.

Rising Fawn Furnace, Rising Fawn, Ga.: 1 stack, blt. 1873-75, rebld. 1902-03; 73' x 18' 6"; six 4-pass stoves (two 80' x 20', four 60' x 18'). Coke: local brown ore. (Formerly owned by Georgia Steel Co.; acquired by Joel Hurt, Sept., 1918). Idle since 1907.

Product: foundry pig iron, annual cap., 72,000 tons.

Hussey-Binns Shovel Co., Pittsburgh, Pa., see 1916 Directory, p. 163. Shovel plant equipment sold early in 1917 to Hubbard & Co., Pittsburgh. Buildings and grounds sold to W. H. Baker and others and subsequently taken over by Hussey-Binns Steel Co.

Hussey-Binns Steel Co., acquired grounds and buildings of Hussey-Binns Shovel Co., Charleroi, Pa., dismantled crucible steel furnaces and installed electric furnaces. Plant acquired by Universal Rolling Mill Co., May 13, 1918.

Hyatt Steel Products, Ltd., Bank of Ottawa Bldg., Vancouver, B. C., Canada.

W. E. Hodges, assignee.

Works at Port Moody, B. C.: one electric fur.; 2 heat. fur.; 12" bar mill. (Formerly owned by Port Moody Steel Works, Ltd.; acquired by Aetna Iron & Steel Works, Ltd., March 1, 1917; acquired by Columbia Iron & Steel Corp., 1918; acquired by Hyatt Steel Products, Ltd., April, 1, 1919.) Made pig iron from scrap in electric furnace in 1918.

Product: steel ingots, annual cap., 1,000 tons; merchant bar, 2,000 tons.

ILLINGWORTH (JOHN) STEEL CO. (The), Frankford, Philadelphia, Pa.

Inc. 1916 in Pennsylvania. Capital stock: com. \$100,000.

John Illingworth, P.; W. H. Illingworth, Sc.; at Newark, N. J. Charles P. Soden, V. P.; Clarence Illingworth, T. & G. M.; at Frankford.

Sales offices: Boston, Hartel Bros., 307 Atlantic Ave.; New York, 217 Broadway.

Works at Frankford: 1 crucible fur. (36-pot); 20 heat. fur. (five 2-d., and fifteen 4-d.); 2 gas producers; 14" 2-h. 4-st. bar, 18" 2-h. 4-st. sheet, 16" 3-h. 1-st. bar, 12" 3-h. 5-st. bar, and 9" 3-h. 5-st. bar; 2 box annealing fur.; 4 steam hammers (1,200-lb. to 3-ton). Fuel, bit. coal and prod. gas.

Product: hammered and rolled steel bars and sheets for tools, saws, knives, files, etc.; rerolled Swedish and Norway iron; annual cap., 2,500 tons crucible ingots, 25,000 tons rolled products, 5,000 tons forged products.

ILLINOIS STEEL CO., 208 South La Salle St., Chicago, Ill.

Inc. May 2, 1889 in Illinois. Subsidiary of United States Steel Corporation.

E. J. Buffington, P.; T. W. Robinson, V. P.; G. G. Thorp, V. P.; T. J. Hyman, Sc. & T.; H. Morrison, A.; E. S. Mills, G. S. M.; C. H. Rhodes, P. A.

Sales offices:

Birmingham, Willard Wilson, Brown-Marx Bldg.

Boston, W. S. Locke, 120 Franklin St.

Buffalo, F. C. Demming, Marine Natl. Bank Bldg.

Chicago, J. G. Carruthers, Cont. & Comm. Natl. Bank Bldg.

Cincinnati, G. H. Vant, Union Trust Bldg.

Cleveland, J. R. Mills, Rockefeller Bldg.

Denver, E. M. Sparhawk, First Natl. Bank Bldg.

Detroit, W. B. Weston, Ford Bldg.

New Orleans, S. W. Wheelock, Maison Blanche.

New York, C. C. Cluff, Hudson Terminal Bldg.

Philadelphia, J. B. Bonner, Widener Bldg.

Pittsburgh, A. M. Harper, Carnegie Bldg.

St. Louis, W. W. Scott, Jr., Third Natl. Bank Bldg.

St. Paul, W. J. Totten, Pioneer Bldg.

Product: bessemer, basic, foundry and malleable pig iron, spiegeleisen and ferro-manganese; bessemer, open hearth and electric steel ingots; alloy steel ingots; blooms, billets, slabs, sheet and tinplate bars; forging billets; rails, light rails and small billets; structural

shapes, beams, angles, channels, tees, zeos, etc.; universal and sheared plates; angle bars, rail joints and splices; tie plates, base plates, etc.; spike, bolt, nut and rivet rods; spikes, bolts, nuts and screw spikes; merchant bars, rounds, squares, flats, bands and special shapes; wire rods; railway car and locomotive axles; steel railway car wheels; forgings; steel, iron, and brass castings, oills, ingot molds and stools for own use.

The company owns and operates the Joliet Works, Joliet, Ill.; Milwaukee Works, Milwaukee, Wis.; South Works, South Chicago, Ill.; North Works, Warehouse and shop, Chicago, Ill.; it also operates under lease the Gary Works, Gary, Ind., owned by the Indiana Steel Co.

Gary Works, Gary, Ind. (owned by Indiana Steel Co.; leased to and operated by Illinois Steel Co.):

Blast Furnaces: 12 stacks.

No	Present size	First Blown in	Relined
1	93' x 22'6"	Mar. 14, 1918	—
2	93' x 22'6"	Mar. 4, 1917	—
3	93' x 22'6"	July 4, 1917	—
4	93' x 22'6"	Apr. 14, 1917	—
5	87'8" x 22'	Mar. 16, 1911	—
6	87'10" x 22'	Mar. 16, 1910	Sept., 1916
7	87'10" x 22'	Dec. 4, 1909	Mar., 1917
8	88' x 22'	Nov. 23, 1909	Mar., 1916
9	87'8" x 22'	June 11, 1909	—
10	87'10" x 22'	Jan. 26, 1909	Mar., 1918
11	87'8" x 22'	Dec. 29, 1908	Dec., 1918
12	87'10" x 22'	Dec. 21, 1908	June, 1916

Thirty-two 3-pass Massicks & Crooke stoves, 100' x 22', fourteen 2-pass center-comb. stoves, 110' x 22'; 23 gas blowing eng., 2 steam blowing eng. (750,000 cfm.); 16 water-tube boilers, 6,400 H. P., serve also converters, hydraulic pumps and mill supply; 6 double-strand Uehling pig casting mach.; rotary kiln sintering plant for flue dust, annual cap., 165,000 tons; 5 slag granulating pits, annual cap., 900,000 tons. By-product coke: Lake ore. Product: basic pig iron, annual cap., 2,173,200 tons.

By-product Coke Plant: 700 Koppers coke ovens, annual cap., 3,360,000 net tons coke. By-product recovery plant; Carl Still benzol plant.

Steel Works and Foundry: 45 B. O. H. fur. (twenty-eight 90-ton, fourteen 100-ton, two 200-ton, one 200-ton building); 2 A. O. H. fur. (10-ton, 25-ton); two 25-ton Bessemer converters for duplexing; 6 mixers (three 300-ton, two 400-ton, one 1,300-ton). Gray iron and bronze foundry. Product and annual cap.: 3,030,000 tons basic open-hearth ingots, 15,000 tons acid open-hearth castings, 7,500 tons gray iron castings, 400 tons bronze castings. Rail Mill: blt. 1908-09, f. o. Feb. 17, 1909; 40" 3-h. 2-st. blooming, 28" 2-h. 10-st. finishing; 12 four-hole soaking pits. Blooming Mill: blt. 1916-18, f. o. Mar. 23, 1918; 40" 2-h. 1-st. reversing; 3 four-hole

8-ingot soaking pits. Billet Mill: blt. 1908-09, f. o. Aug. 16, 1909; 40" 2-h. 4-st. blooming, 32" 2-h. 5-st. blooming, 24" 2-h. 6-st. cont. billet, 18" 2-h. 6-st. cont. billet, 18" 2-h. 8-st. cont. sheet bar; 12 four-hole soaking pits. Slabbing Mill: blt. 1913-14, f. o. June 29, 1914; 36" 2-h. 1-st. reversing mill; 8 four-hole soaking pits. Universal plate mill: blt. 1911, f. o. Nov. 14, 1911; 5 slab rehear. fur.; 60" 3-h. 1-st. universal plate, top and bottom rolls 36" x 84". Sheared Plate mill: blt. 1916-17, f. o. Oct. 22, 1917; 44" x 160" 3-h. 1-st. sheared plate, middle roll 24" x 160"; 5 slab rehear. fur. Merchant Mills: blt. 1909-11; 18" 2-h. 5-st. and 18" 3-h. 2-st.; 14" 2-h. 5-st. and 14" 3-h. 2-st.; 14" 2-h. 4-st., 12" 2-h. 2-st. and 12" 3-h. 2-st.; 14" 2-h. 5-st. and 12" 2-h. 4-st. looping; 12" 2-h. 6-st. and 10" 2-h. 6-st. looping. Merchant Mill: blt. 1916-18, f. o. Oct. 18, 1918; 24" 2-h. 4-st., 20" 2-h. 5-st. and 20" 3-h. 2-st. Merchant Mill: blt. 1916-19, f. o. Mar. 10, 1919; 13" 2-h. 6-st. cont., 12" 2-h. 1-st. and two finishing mills, each 12" 2-h. 1-st., 10" 2-h. 2-st. and 9" 2-h. 2-st. looping. Building 20" 2-h. 10-st., and 12" 2-h. 13-st. mills (annual cap. 300,000 tons).

Axle Mill: blt. 1909-10, f. o. July 29, 1910; cont. heat. fur.; 26" 2-h. 4-st. rolling mill; 6 steam ham. (7,500-lb.); cutting off, centering machines and lathes. Steel Wheel Plant: blt. 1916-18, f. o. Dec. 1918; 10,000-ton forming press, 1,000-ton hub press, horizontal rolling mill, 600-ton web punch press, 2,000-ton coning press; one cont. heat. fur., 3 rehear. fur., boring and turning mills. Product and annual cap.: 1,065,600 tons blooms and billets, 479,000 tons slabs, 104,000 tons sheet bars; 1,997,900 tons finished hot rolled products, including 750,000 tons rails, 258,000 tons heavy structural shapes, 180,000 tons sheared plates, 208,000 tons universal plates, 529,900 tons merchant bars, 72,000 tons tie plate bars; 120,000 tons axles and forgings; 60,000 tons steel railway car wheels.

Joliet Works, Joliet, Ill.:

Blast Furnaces: 4 stacks; No. 1, 78' 5" x 19' 6", blt. 1873, f. o. June 9, 1880; No. 2, 78' 5" x 19' 6", blt. 1873, f. o. Feb. 8, 1882; No. 3, 85' 1" x 21' 6", blt. 1903, f. o. Jan., 1904, relined May, 1917; No. 4, 90' 1" x 22', blt. 1906, f. o. Sept. 2, 1906; 16 stoves (four 2-pass side-comb. 110' x 22', four 2-pass center-comb. 110' x 22', four 4-pass 100' x 25', four 3-pass McClure 101' 9" x 22'); 7 steam blowing eng. (200,000 cfm.); 31 water-tube boilers, 10,739 H. P., serve also converters and rod mills; 2 double-strand Heyl & Patterson pig casting mach., By-product coke: Lake ore. Product: bessemer pig iron, annual cap., 655,400 tons.

By-product Coke Plant: 280 Koppers ovens, annual cap., 1,005,500 net tons coke. By-product recovery plant. Carl Still benzol plant. Steel Works: blt. 1870; 3 Bessemer converters (two 10-ton, one 12-ton); 6 cupolas; one 4-ton Heroult electric fur. for melting ferro-manganese; two 250-ton mixers; gray iron, brass and roll foundry; 10 heat. fur. (5 cont., three 4-d., one 5-d., one

6-d.); 36" 3-h. 1-st. blooming; 25" 3-h. 1-st. roughing, 24" 3-h. 1-st. finishing; 18" 2-h. 6-st. cont. rod.; 16" 2-h. 1-st., 12" 2-h. 3-st., 10" 2-h. 4-st., 9" 2-h. 4-st. Garrett rod; 16" 2-h. 1-st., 14" 2-h. 3-st., 11" 2-h. 4-st., 10" 2-h. 4-st. Garrett rod; 11½" 2-h. 2-st., 10" 2-h. 2-st. Morgan cont. rod; 18" 3-h. 2-st., 18" 2-h. 1-st., 12" 3-h. 5-st. and 12" 2-h. 2-st. merchant mill. Splice bar and rail joint shop. Spike, bolt and nut dept. Product and annual cap.: 732,000 tons ingots; 624,000 tons billets; 586,600 tons finished hot-rolled products, including 252,000 tons wire rods, 129,000 tons spike, bolt and nut rods, 11,200 tons tie-plate bars, 176,400 tons continuous joints and angle splice bars; 856,800 kegs standard spikes, 38,080 kegs screw spikes, 359,520 kegs track bolts and nuts.

Milwaukee Works, Milwaukee, Wis.:

Blast Furnaces: 2 stacks; 66' x 16', blt. 1870-71; No. 1, f. o. Apr., 1870; No. 2, f. o. Apr., 1871; six 3-pass Massicks & Crooke stoves, 60' x 18'; 5 steam blowing eng. (53,000 cfm.); 4 water-tube, 4 tubular boilers, 2,200 H. P. By-product and W. Va. beehive coke: Lake ore. Product: foundry and malleable bessemer pig iron, annual cap., 113,800 tons.

Rolling Mills: orig. blt. 1868; 10 cont. reheating fur. with 20 gas prod.; 22" 3-h. 2-st. and 22" 2-h. 1-st. bar; 21" 3-h. 4-st. and 21" 2-h. 1-st. bar; 16" 3-h. 2-st., 12" 3-h. 1-st. and 12" 2-h. 3-st. merchant; 12" 3-h. 2-st. and 9" 2-h. 5-st. merchant; 14" 3-h. 2-st. and 9" 2-h. 5-st. merchant; 12" 2-h. 4-st. and 8" 2-h. 5-st. merchant; 4 annealing fur.; 3 heat treating fur.; 1 pickling tank. Product and annual cap.: 241,900 tons finished hot rolled products, including 50,000 tons light rails, 7,500 tons heavy and 40,000 tons light structural shapes, 139,400 tons merchant bars, 1,500 tons bolt, nut and rivet rods, 3,500 tons flat and angle splice bars.

South Works, South Chicago, Ill.:

Blast Furnaces: 11 stacks.

No.	Present size.	Built	First blown in	Rebuilt	Relined
1	90' x 22'	1880-81	June, 1881	1906-07	—
2	90' x 22'	1880-81	June, 1881	1907	1916
3	90' x 22'9"	1880-81	1882	1906	—
4	90' x 22'	1880-81	1882	1907-08	—
E	90' x 22'	1905-06	June 21, 1906	—	1917
5	90' x 21'3"	1890-91	May, 1891	1910	—
6	92' x 23'6"	1890-91	May, 1891	1918	—
7	94' x 22'	1890-91	July, 1891	1908-09	1916
8	92' x 22'	1890-91	Jan., 1892	1908-09	—
9	99'3" x 22'6"	1900-01	July 3, 1901	1909	1918
10	95' x 22'	1900-01	Dec. 3, 1901	1907-08	—

Forty-five hot blast stoves (9 Whitwell 4-pass 100' x 25'; 4 Cowper 2-pass 90' x 25'; 12 Cowper 2-pass 107' 11" x 21"; 3 Cowper 2-pass 90' x 21'; 1 Cowper 2-pass 95' x 21'; 16 Massicks & Crooke 3-pass 92' 6" x 21' 11"); 17 steam blowing eng., 9 gas blowing eng. (900,000 cfm.); 90 water-tube boilers, 31,400 H. P., serve also duplex

plant, rail, slab and plate mills, electric generating stations and foundry; 6 Heyl & Patterson double-strand pig casting mach.; rotary kiln sintering plant for flue dust, annual cap., 58,000 tons; 3 slag granulating pits, annual cap., 600,000 tons. By-product and Conn. and Pocahontas beehive coke: Lake ore and domestic and foreign manganese ores. Product: bessemer and basic pig iron, spiegeleisen, ferro-manganese and ferro-silicon, annual cap., 1,992,100 tons. Steel Works: three 25-ton Bessemer converters used duplex and direct; 6 cupolas for pig iron; 30 B. O. H. fur. (twenty 50-ton, six 40-ton one 25-ton, three 100-ton); 5 Heroult electric fur. (two 15-ton, three 25-ton); 5 mixers (one 150-ton, one 250-ton, two 300-ton, one 1,300-ton). Gray iron and brass foundry. Product and annual cap.: 2,339,800 tons steel ingots (240,000 tons bessemer, 1,931,800 tons basic open hearth, 168,000 tons electric); 6,000 tons basic open hearth steel castings for own use; gray iron (169,800 tons) and brass (420 tons) castings.

Rolling Mills: 28 soaking pits (twelve 1-hole, twelve 4-hole, four 6-hole); 17 heat. fur. (thirteen 5-d., 4 cont.); 40" 2-h. 1-st. reversing slabbing; 40" 2-h. 1-st. reversing blooming; 35" 2-h. 1-st. reversing blooming; structural mill with 32" 2-h. 1-st. roughing, 30" and 28" 3-h. 2-st. and 28" or 30" 2-h. 1-st. finishing; structural mill with 24" 2-h. 4-st., 24" 3-h. 1-st., 21" 2-h. 2-st. and 21" 3-h. 1-st.; rail mill with 40" 3-h. 1-st. blooming, 28" 3-h. 3-st. and 28" 2-h. 1-st.; 24" 3-h. 3-st. light rail mill; 30" 2-h. universal plate mill, rolls 24" x 67"; two 90" 3-h. sheared plate mills 36" x 90"; one 132" 3-h. sheared plate mill, 38" x 132"; 2 pickling tanks; one 1,500-ton hydraulic press. Product and annual cap.: 990,500 tons blooms and billets, 668,600 tons slabs, 312,000 tons sheet and tinplate bars; 1,140,500 tons finished hot rolled products including 96,000 tons rails, 454,500 tons heavy structural shapes, 62,000 tons merchant bars; 108,000 tons universal plates, 420,000 tons sheared plates; 48,000 tons forged blooms and billets.

Union Works, Chicago, dismantled in July, 1916.

Total annual capacity: 4,934,500 tons pig iron, spiegeleisen and ferro-manganese; 6,101,800 tons steel ingots (972,000 tons bessemer, 4,961,800 tons basic open hearth, 168,000 tons electric); 21,000 tons steel castings for own use (6,000 tons B. O. H., 15,000 tons A. O. H.); 4,243,700 tons blooms, billets, slabs, and sheet and tinplate bars; 3,948,900 tons finished hot rolled products, including 896,000 tons rails, 760,000 tons structural shapes, 316,000 tons universal plates, 600,000 tons sheared plates, 252,000 tons wire rods, 731,300 tons merchant bars, 83,200 tons tie-plate bars, 130,500 tons spike, bolt, nut and rivet rods, 179,900 tons flat and angle splice bars and rail joint bars; 168,000 tons forgings; 60,000 tons steel railway car wheels.

Steel supply plants and storage warehouses:

North Works, Chicago, Ill. (Illinois Steel Co.): plant for cutting

to size and distributing steel from warehouses; annual cap., 120,000 tons. Warehouses with storage capacity of 35,000 tons.

St. Louis Warehouse, 21st and Gratiot Sts., St. Louis (Illinois Steel Warehouse Co.): plant for cutting to size and distributing; annual cap., 24,000 tons. Warehouses have a storage capacity of 8,000 tons.

St. Paul Warehouse, Twin City Plant, University Ave. and Eustis St., St. Paul (Illinois Steel Warehouse Co.): annual cap., for cutting to size and distributing, 30,000 tons. Warehouses have a storage capacity of 13,000 tons.

Imperial Drop Forge Co., Indianapolis, Ind., see Hercules Forge Co.

INDIANA ROLLING MILL CO., New Castle, Ind.

Inc. 1902 in Indiana. Capital stock: com. auth. \$400,000, issued \$370,200; pref. 7% non-cum. \$150,000.

S. A. Ingersoll, P.; R. C. Ingersoll, V. P.; A. P. Zetterberg, Sc.; H. G. Ingersoll, T.; G. A. Sahli, A.

Works at New Castle: blt. 1902-3; f. o. June 1, 1903; rebt. 1917; 5 heat. fur. (three 2-d., one 4-d., one 6-d.); 2 gas producers; 3 saw plate mills (48" and 60" 2-h. 2-st., 22" x 36" 2-h. 3-st. and 22" x 36" 2-h. 3-st.). Fuel, coal, nat. and prod. gas. Department for the manufacture of shovels is connected with Works.

Product: high carbon sheet steel for saws, discs, reapers, shovels, etc. Also shovels, spades and scoops. Annual cap., 6,000 tons of sheets.

INDIANA STEEL CO., 208 South La Salle St., Chicago, Ill.

Inc. Feb. 1, 1906. Subsidiary of the United States Steel Corporation.

E. J. Buffington, P.; G. G. Thorp, V. P.; T. J. Hyman, Sc. & T.; L. W. McNamee, A.

Indiana Steel Co. owns the Gary Works at Gary, Ind., leased to and operated by the Illinois Steel Co., which see for description.

INDUSTRIAL STEEL CASTING CO. (The), Water Works Drive, Toledo, Ohio.

Inc. Feb. 3, 1917 in Ohio. Capital stock: com. \$100,000. (Formerly known as the Taylor Coupler and Steel Casting Co.).

L. S. Dukes, P.; W. E. Wine, V. P. & G. M.; R. F. Tillman, Sc., A. & P. A.; Joseph L. Tillman, T.; Frank T. Tillman, G. S.; F. W. Hudson, Works M. & S. M.

Works at Millard Ave. & Front St., Toledo, O.: 1 Industrial electric fur. (2-ton), f. o. Oct. 1, 1919.

Product: small commercial steel castings for sale; annual cap., 3,000 tons.

INDUSTRIAL WORKS, Bay City, Mich.

Inc. July 21, 1904 in Michigan. Capital stock: com. \$250,000.

William L. Clements, P.; W. W. Clements, A. P.; Ernest B. Perry,

V. P. & G. M.; Charles R. Wells, Sc. & T.; Walter B. Perry, G. S.; Benjamin Dixon, G. S. M.; A. J. Copeland, P. A.

Selling agents:

Birmingham, C. B. Davis Engineering Co.
Chicago, McCormick Bldg., (branch office).
Detroit, Book Bldg. (branch office).
Los Angeles, N. B. Livermore Co.
Montreal, F. H. Hopkins & Co.
New York, 50 Church St. (branch office).
Philadelphia, Widener Bldg. (branch office).
Portland, Northwestern Equipment Co.
St. Louis, J. G. Miller.
San Francisco, N. B. Livermore Co.
Seattle, Northwestern Equipment Co.
Toronto, F. H. Hopkins & Co.

Works at Bay City: orig. blt. 1873; 2 Tropenas converters (2½-ton); 5 cupolas; construction commenced Nov. 1, 1911; f. o. Mar., 1912. Fuel, coke.

Product: vanadium steel castings for own use in the manufacture of railway wrecking cranes and equipment, pile drivers, rail saws, steam, electric and gasoline locomotive cranes, pillar and gantry cranes, and transfer tables; annual cap., 5,000 tons steel castings. Also make for own use gray iron castings, annual cap., 10,000 tons; and semi-steel castings, annual cap., 3,000 tons.

INLAND STEEL CO., 38 South Dearborn St., Chicago, Ill.

Inc. Feb. 7, 1917 in Delaware. Capital stock: com. auth. \$30,000,-000, issued \$25,019,500. Bonds \$5,621,000.

L. E. Block, Ch.; Philip D. Block, P.; G. Herbert Jones, V. P. & G. S. M.; Edward M. Adams, V. P. & Sc.; E. J. Block, V. P.; H. C. Jones, V. P.; William D. Truesdale, T.; J. H. Morris, A.; at Chicago. John W. Lees, G. S.; at Indiana Harbor.

Sales offices:

Denver, Detroit, Kansas City, Milwaukee, Peoria, St. Louis, St. Paul.

Brand: "Inland" for pig iron, "Inland" in a diamond for rolled products and "Vismara" steel sheets.

Product: basic and foundry pig iron; steel ingots; billets, slabs, sheet bars; sheared plates; sheets, steel roofing, light plates; angles, tees, I beams, channels, agricultural shapes, merchant bars, spikes, bolts, nuts and rivets.

Indiana Harbor Works, Indiana Harbor, Ind.:

Inland Furnaces (formerly called Madeline Furnaces): 3 stacks; No. 1, 85' x 20' 6", blt. 1906-07, f. o. Aug. 30, 1907; No. 2, 90' x 21' 4", blt. 1911-12, f. o. April 3, 1912; No. 3, 90' x 21' 4", blt. 1916-17, f. o. Apr. 24, 1917; 12 hot blast stoves (4 Kennedy 93' x 22', 8 Roberts 93' x 24'); 10 steam blowing eng.; 16 water-tube

boilers, 8,000 H. P.; 2 Uehling double-strand pig casting mach.; Greenawalt sintering plant for flue dust, annual cap., 30,000 tons. By-product coke: Lake ore. Product: basic and foundry pig iron, annual cap., 500,000 tons.

By-product Coke Plant: 130 Koppers coke ovens, annual cap., 500,000 net tons coke. By-product recovery plant, Koppers benzol recovery plant.

Steel Works: blt. 1901-02; first steel made July 21, 1902, first rolled products, Nov. 1, 1902; 22 B. O. H. fur. (twelve 55-ton, ten 80-ton); one 600-ton mixer; 10 soaking pits (seven 4-hole, two 2-hole, one 3-hole); three 3-d. slab heat. fur.; 11 cont. heat. fur.; 40" 2-h. 1-st. blooming; 36" 2-h. 1-st. blooming; 32" 2-h. 1-st. blooming; 24" 3-h. 3-st. billet and sheet bar; 24" 2-h. 4-st. bar and universal; 16" to 8" 2-h. 11-st. cont. bar; 32" 2-h. 1-st. roughing and 28" 3-h. 3-st. comb. billet, rail and structural mill; 32" x 90" 3-h. 1-st. sheared plate; universal plates are rolled on 24" bar mill; 2 jobbing plate mills, 27" x 56" and 28" x 60"; 16 sheet and 16 pair fur.; 16 hot black sheet mills; 18 box annealing fur.; 2 blueing fur.; one pickling mach.; 3 pickling tanks; 8 galvanizing pots (annual cap., 55,000 tons). Spike, bolt and rivet dept. Fuel, coal, prod. gas, coke oven gas and oil. Product and annual cap.: 1,000,000 tons steel ingots; 850,000 tons blooms, billets, slabs, and sheet bars; 250,000 tons structural shapes, 90,000 tons sheared plates, 95,000 tons sheets and light plates, 55,000 tons galvanized sheets, 100,000 tons merchant and concrete bars, 15,000 tons misc. hot-rolled products; 50,000 kegs rivets, 100,000 kegs spikes, 50,000 kegs track bolts.

Chicago Heights Works, Chicago Heights, Ill.: blt. 1893-94; f. o. Jan., 1894; 1 cont. heat. fur.; 14" 3-h. 8-st. bar train and 6 hammers. Fuel, coal, coke and oil. Product: bars, angles, tees, channels, agricultural shapes. Annual cap., 30,000 tons of bar steel and 1,500 tons of harrow teeth.

The Inland Steel Co. controls the Inland Coal & Washing Co., which owns 200 acres of coal lands at De Soto, Jackson Co., Ill.; also the Indianola Coal Co., which owns 2,000 acres coal lands near Pittsburgh, Pa.

The company owns the Laura mine near Hibbing, Minn., on the Mesabi Range and the Armour No. 1, Armour No. 2 and Thompson Mines near Crosby, Minn., on the Cuyuna Range, annual cap. 800,000 tons.

INTERMONT COAL & IRON CORPORATION, Big Stone Gap, Va.
Inc. June 29, 1916 in Virginia. Capital stock: com. \$500,000; bonds \$260,000.

R. T. Irvine, P.; J. H. Mathews, Sc.; J. H. Pierpoint, T. & A.; M. H. Maury, G. M.; at Big Stone Gap. L. M. Williams, V. P.; at Richmond, Va.

Selling agents: Rogers, Brown & Co., Cincinnati.

Brand: "Big Stone Gap."

Union Furnace at Big Stone Gap: 1 stack, 75' x 16'; orig. blt. 1890-92; last rebt. 1917; 4 hot blast stoves (three 60' x 22', one 35' x 22'); 5 steam blowing eng. (45,000 cfm.); 7 water-tube boilers, 2,000 H. P. Beehive coke: local and Lake ore. (Formerly owned by L. M. Williams; acquired by Intermont Coal & Iron Corp., July 1, 1916.)

Product: foundry pig iron, annual cap., 35,000 tons.

The company operates 100 beehive coke ovens at Josephine, Va., annual cap., 48,000 net tons. It also owns and operates iron ore mines at Irondale, Harvey, Noes, and Lavine, Va., total annual cap., 75,000 tons; limestone quarry at the Furnace, annual cap., 35,000 tons.

INTERNATIONAL HARVESTER CO., 606 South Michigan Ave., Chicago, Ill.

Inc. Sept. 19, 1918 in New Jersey. Capital stock: com. \$80,000,000; pref. 7% cum. \$60,000,000.

Cyrus H. McCormick, Ch.; Harold F. McCormick, P.; Alex Legge, V. P. & G. M.; H. F. Perkins, V. P.; W. V. Couchman, V. P.; A. E. McKinstry, V. P.; H. B. Utley, V. P.; P. S. Post, V. P.; George A. Ranney, Sec. & T.; William Reay, C.; G. E. Rose, G. S. of Steel Works; at Chicago, Ill.

Sales agent: Wisconsin Steel Co. (a subsidiary), Chicago, Ill.

The plants and properties described below, formerly owned and operated by Wisconsin Steel Co., were taken over by the International Harvester Co. in 1917.

Wisconsin Steel Works, South Chicago, Ill.:

Blast Furnaces: 3 stacks; Furnace A, 78' x 16'; blt. 1880, last rebt. 1906; four 2-pass stoves (75' x 20'); Furnace No. 1, 90' 6" x 21' 6"; blt. 1902-03; f. o. Aug. 7, 1903; rebt. 1914, relined 1919; five 2-pass stoves (four 82' x 22', one 90' x 22'); Furnace No. 2, 90' x 21' 6"; blt. 1906-08; f. o. June 30, 1908; four 2-pass stoves, 90' x 22'; 9 steam blowing eng. (160,000 cfm.); 35 water-tube boilers, 12,322 H. P., furnish power to rolling mills also; 1 Uehling double-strand pig casting machine; molten metal to mixers. Va., Ky. and Conn. coke: Lake ores. Product: bessemer pig iron, annual cap., 500,000 tons.

Steel Mill: blt. 1902-03; f. o. Mar. 31, 1903; first steel made Sept. 3, 1903; two 10-ton Bessemer converters; 2 metal mixers (250-ton); 1 cupola; 5 cont. reheat. fur.; 14 gas producers; eight 1-hole soaking pits; 35" 2-h. 1-st. blooming mill; Morgan cont. bar mill (known as No. 1 merchant mill) with 14" 2-h. 8-st. roughing, 11" 2-h. 4-st. finishing and 8" 2-h. 2-st. finishing; Morgan bar mill (known as No. 2 merchant mill) with 16" 2-h. 8-st. roughing and 14" 2-h. 3-st. finishing; bar mill (known as No. 4 merchant mill) with 14"

2-h. 4-st. roughing, 16" 3-h. 1-st. roughing, 16" 2-h. 1-st. roughing, 12" 2-h. 5-st. finishing and 8" 2-h. 2-st. finishing: cold drawing Dept. (No. 3 mill); 21" 1-st. cold rolling mill; one 1,000-ton shear; 10 straightening presses; 3 drawing benches; 7 straightening machines; 12 cutting-off mach.; 2 shears; 4 turning machines; one 4-drum wire bench; 2 automatic straighteners; 10 hand pickling tanks. Fuel, Indiana bit. coal and prod. gas. Product: ingots, billets, blooms, bars and shapes; annual cap., ingots 370,000 tons, blooms and billets 330,000 tons, finished rolled products 300,000 tons, cold drawn shafting 35,000 tons.

Deering Works Rolling Mill, 2201 Oakdale Ave., Chicago, Ill.: blt. 1901, f. o. Oct. 10, 1901; 3 hand-fired 2-d. heat. fur.; 13" 3-h. 5-st. straight mill. Fuel, bit. coal. Product: merchant flats, rounds, angles, channels and ovals, rolled from old steel rails and billets; annual cap., 26,800 tons.

COKE, ORE PROPERTIES, ETC.

The company owns the Agnew Mine at Hibbing, Minn., the Hawkins Mine at Nashwauk, Minn., the Illinois Mine, North Freedom, Wis., and the Sargent Mine at Nashwauk, Minn. The Wisconsin Steel Co. owns about 6,500 acres of lands, in Harlan County, Ky., upon which it operates a coal mine and 408 beehive coke ovens at Benham, Ky., annual cap., 175,000 net tons coke. There are 88 Wilputte by-product coke ovens at South Chicago with an annual cap. of 360,000 net tons coke; also by-product recovery plant and Wilputte benzol plant, annual cap., 240,000 gallons of light oil.

INTERNATIONAL HIGH SPEED STEEL CO., Rockaway, N. J. Inc. 1905 in New York. Capital stock: com. auth. \$100,000, issued \$99,900.

William Garrow Fisher, P.; William G. Fisher, Jr., Sc.; at Rockaway. Ralph Gillette, V. P. & T.; at 99 Nassau St., New York.

Selling agents:

Cobalt, Ontario, H. L. Usborne.

Denver, Colorado.

Houghton, Mich., W. G. Phillips.

Salt Lake City, Richmond Machinery Co.

San Francisco, Harron, Richard & McCone, 139-149 Townsend St.

Spokane, Western Machinery & Equipment Co.

Scranton, Pa., Denver Rock Drill Mfg. Co.

Toronto, Ont., H. L. Usborne, 30 Sun Life Bldg.

Victoria, B. C., E. G. Prior & Co.

Works at Rockaway: blt. 1915-18; f. o. Aug., 1915; four 2-d. billet heat. fur.; 12" 3-h. 5-st. and 10" 3-h. 6-st. bar; 1 box annealing fur.; 6 steam hammers (200-lb. to 2½-ton).

Product and annual cap.: mining and rock drill steel, 15,000 tons; high speed and alloy tool steel, 5,000 tons; chrome, vanadium, nickel and chrome-nickel steel, 5,000 tons; carbon tool steel, 5,000 tons; forgings, 1,000 tons.

International Molybdenum Co., Ltd., Orillia, Ont., Canada.

Inc. 1916 in Province of Ontario.

Works at Orillia, Ontario; blt. 1916, f. o. 1916; electric furnaces for manufacture of ferro-molybdenum. Own mines and custom concentrator at Renfrew, refinery at Orillia for manufacture of ferro-molybdenum, molybdic acid and ammonium molybdate.

Company not operating, in process of liquidation.

INTERNATIONAL PAPER CO., 30 Broad St., New York, N. Y.

Works at Niagara Falls, N. Y.: electric furnace plant for manufacture of ferro-silicon, annual cap., 3,000 tons 50% ferro-silicon.

International Steam Pump Co., New York, see 1916 Directory, p. 172, reorganized in 1916 as the Worthington Pump & Machinery Corp'n.

INTERSTATE IRON & STEEL CO., 104 South Michigan Ave., Chicago, Ill.

Inc. Mar. 30, 1905 in Illinois. Capital stock: com. \$4,000,000; pref. auth. \$3,000,000, issued \$2,400,000.

Silas J. Llewellyn, P.; George F. Davie, V. P. & T.; John McConnell, V. P.; Wm. P. Mullin, V. P.; Justin E. Russell, Sec.; George F. Eggert, A.; R. S. Le Barre, G. S. M., Alloy Division; Paul Llewellyn, G. S. M., Bar Division; A. T. Weaver, G. S. M., Wire Products Division; B. L. Verner, P. A.

Sales offices:

Cleveland, J. E. Rawson, Rose Bldg.

Detroit, F. Walter Guibert and George E. Quigley, Ford Bldg.

Milwaukee, A. R. Jones and Charles Belik, First Wisconsin National Bank Bldg.

New York, H. S. Schroeder, 52 Vanderbilt Ave.

San Francisco, A. J. Boyce, 16 California St.

St. Paul, Paul J. Kalman, Merchants National Bank Bldg.

East Chicago Works, East Chicago, Ind.: blt. 1900; f. o. July, 1900;

1 single and 1 double puddling fur.; 12 double sand-bottom busheling fur.; 1 squeezer; 8 heat. fur. (two 4-d., six 5-d.); 22" mill with 1-st. 2-h. and 2-st. 3-h.; 18" 3-h. 2-st. muck; 16" mill with 1-st., 2-h. and 2-st. 3-h.; 9" Belgian with 13" roughing, 1-st. 2-h. and 4-st. 3-h.; 8" Belgian with 12" roughing, 1-st. 2-h., 4-st. 3-h. Fuel, coal. Product: bar iron, iron tie plates, soft steel bars and shapes, alloy steel bars (chrome, nickel, vanadium), steel tie plates, deformed and twisted steel squares; annual cap., 60,000 tons muck and scrap bar, 150,000 tons finished rolled products.

118 Street Steel Works, Chicago: blt. 1902-03; f. o. July, 1903; 6 B. O. H. fur. (two 50-ton, four 75-ton), 35" 2-h. 1-st. blooming mill. Fuel; prod. gas and oil. (Formerly owned by Grand Crossing Tack Co.; acquired by Interstate Iron & Steel Co., Dec., 1916). Will install in 1920 Morgan cont. bar mill with 16" 2-h. 6-st. roughing rolls, 14" 2-h. 2-st. finishing and 12" 2-h. 4-st. duo finishing mills. Product: steel ingots, billets and bars; nickel,

chrome and vanadium alloy steel; annual cap., 250,000 tons ingots; 225,000 tons billets and bars.

Grand Crossing Works, Chicago, Ill.: wire rod mill added to a wire and wire nail plant in 1899-1900; f. o. Feb. 1, 1900; 1 Morgan cont. heat. fur.; 1 cont. wire rod train; 114 wire drawing blocks for wire $\frac{1}{2}$ " to 16 gage; 82 wire nail mach.; 16 barbed wire mach.; 3 wire fence mach.; 30 rivet mach.; galvanizing pans. Fuel, bit. coal. (Formerly owned by the Grand Crossing Tack Co.; acquired by the Interstate Iron & Steel Co., Dec., 1916). Product: wire rods (50,000 tons), plain wire (42,000 net tons), galvanized wire (20,000 net tons), wire nails (250,000 kegs of 100 lbs.), barbed wire (7,500 net tons), wire fencing (750 net tons).

Marion Works, Marion, Ohio, sold to The Pollak Steel Co., Dec. 1, 1919.

Iron Mountain Alloy Co., Utah Junction, Colorado.

Works at Utah Junction: 2 electric furnaces for manufacture of ferro-manganese, annual cap., 3,600 tons. Company went out of business Feb. 28, 1919, and will not resume.

Iroquois Iron Co. Chicago, Ill., 1916 Directory, p. 174. Was consolidated with the Mark Mfg. Co. to form the Steel & Tube Co. of America, July, 1918.

IVANHOE FURNACE CORPORATION, Ivanhoe, Va.

Inc. 1906 in Virginia.

G. W. Reden, P.; C. R. Huddle, Sc. & G. S.

Ivanhoe Furnace, Ivanhoe, Va.: 1 stack, 70' x 12', blt. 1881-2; last rebt. 1906; 3 stoves (65' x 16'); 2 steam blowing eng. (2,600 cfm.); 1 tubular, 6 water-tube boilers, 1,900 H. P. Pocahontas coke; local limonite ore, brown hematite and magnetite ore. (Formerly owned by Ivanhoe Furnace Co., controlled by the Carter Iron Co.; acquired by the Ivanhoe Furnace Corp.).

Product: foundry, low-phosphorus and basic pig iron; annual cap., 25,000 tons.

IVINS' (ELLWOOD) TUBE WORKS, Oak Lane Station, Philadelphia, Pa.

Ellwood Ivins, Proprietor; Martin Hey, G. M. & G. S.; J. B. Cording, G. S. M. & P. A.; H. S. Kircher, Production M.

Works at Oak Lane (grounds leased; plant owned): blt. 1893; f.o. 1894; 5 forge fires; 4 heat. fur.; 2 trains (22"). Fuel, bit. coal. Product: blanks for own use in manufacture of cold drawn seamless steel tubes; tool steel tubes; annual cap., 500 tons blanks.

Jackson, J. T. (Estate of), 13th & Chestnut Sts., Philadelphia, Pa.
Liberty Furnace and other properties of Shenandoah Iron & Coal Co. purchased by J. T. Jackson, Jan., 1916.
Liberty Furnace, Liberty Furnace, Va.: 1 stack, 55' x 11', blt. 1890-91, remod. 1903; Durham iron pipe stove. Charcoal: local brown hematite ore. Product: charcoal pig iron, annual cap., 25,000 tons. *Last active in 1906, for sale.*
Iron ore mines near the furnace; 3-ft. gauge railroad, furnace to Edinburg, 12 miles.

JACKSON IRON & STEEL CO. (The), Jackson, Jackson Co., Ohio.
Inc. Aug. 13, 1906, in Ohio. Capital stock: com. auth. \$300,000, issued \$250,000.

Simon Labold, P.; at Portsmouth, O. David D. Davis, V. P.; at Oak Hill, O. John F. Morgan, Sec., T. & A.; Noah G. Spangler, G. M.; George T. Loudon, G. S.; John S. Morgan, G. S. M. & P. A.; at Jackson.

Selling agents:

Hickman, Williams & Co., at Chicago, Pittsburgh and St. Louis.
Crocker Brothers, New York.

Pickands, Mather & Co., Cleveland.

M. A. Hanna & Co., Cleveland.

Matthew Addy Co., Cincinnati.

Walter Wallingford & Co., Cincinnati.

Reliance Iron & Coke Co., Cincinnati.

Brand: "Jisco."

Jisco Furnace, Jackson, Ohio: 1 stack, 75' x 17'6"; blt. 1906-08; f. o. Oct. 6, 1908; relined 1918; 5 Amsler hot blast stoves (75' x 18'); 3 steam blowing eng. (22,500 cfm.); 6 water-tube boilers, 2,400 H. P. West. Va. coke and native raw coal: Lake and local ore.

Product: silvery pig iron and bessemer ferro-silicon; annual cap., 45,000 tons.

JANSON STEEL AND IRON CO., Columbia, Pa.

Org. Jan. 5, 1888; inc. Jan. 30, 1914. Capital stock: com. auth. \$100,000, issued \$59,000.

Joseph Janson, P.; Valentine Janson, T.; Frank V. Kasel, Sec.; Frank Janson, G. M., G. S. M. & P. A.

Works at Columbia, Pa.: blt. 1905-06, f. o. Oct., 1906; 5 heat. fur. (3-d.); 22" 3-h. 2-st. bar, 12" 3-h. 5-st. guide mill. Fuel, bituminous coal.

Product: bar iron and steel, twisted square concrete bars, annual cap., 20,000 tons.

Jefferson Iron Co.

Jefferson Furnace, Jefferson, Texas, see 1916 Directory, p. 175. Sold to the Missouri Iron & Steel Corp., Nov. 1, 1917. Furnace was dismantled and removed to Haigart, Mo.

Jefferson Iron Co. (The), Oak Hill, Ohio, see 1916 Directory, p. 175. Charcoal blast furnace dismantled in 1917; company out of business.

JENIFER IRON CO., Jenifer, Ala.

Inc. 1919 in Delaware. Capital stock: com. \$1,000,000.

W. Aubrey Thomas, P. & G. M.; at Jenifer. John M. Thomas, V. P.; at Milwaukee. T. E. Thomas, Sec. & T.; at Niles, Ohio. Brand: "Jenifer."

Jenifer Furnace, Jenifer, Ala.: 1 stack, 75' x 15', blt. 1901; f. o. Sept. 26, 1901; rebt. 1918; 4 stoves (two 45' x 16', one 60' x 16', one 75' x 20'); 3 steam blowing eng. (30,000 cfm.); 6 water-tube boilers, 2,400 H. P. Beehive coke: local brown hematite ore. Company owns iron ore mines at Jenifer, annual cap., 100,000 tons; limestone quarries at Wewoke, Ala.; and 100 beehive coke ovens at Aubrey, Ala., annual cap., 35,000 net tons. (Formerly owned by Jenifer Iron and Coal Co.; acquired by Central Alabama Coal & Iron Co., Feb., 1918; acquired by Jenifer Iron Co., July 28, 1919).

Product: foundry pig iron; annual cap., 50,000 tons.

Jenifer Iron & Coal Co., Milwaukee, Wis., see 1916 Directory, p. 176, was sold to Central Alabama Coal & Iron Co., in Feb., 1918, and sold by last named company to Jenifer Iron Co., July 28, 1919.

JESSOP STEEL CO., Washington, Pa.

Inc. Nov. 22, 1901 in Pennsylvania.

W. H. Thomas, P.; at Sheffield, England. W. H. Morton, V. P. & T.; O. Sewell, A. T.; at 91 John St., New York. John T. Wood, Sec.; S. A. Grayson, G. M.; at Washington, Pa.

Works at Washington, Pa.: blt. 1901-02; first steel made Nov. 13, 1902; first products rolled Dec. 5, 1902; 1 Gronwall-Dixon electric fur. (5-ton); three 36-pot crucible fur.; 8 heat. fur. (2-d.); five 2-d. annealing fur.; one 2-h. 1-st. cogging; 24" 2-h. 2-st. and 20" 2-h. 4-st. band mills; 1 sheared plate mill, 24" x 66"; 1 jobbing plate mill, 24" x 34"; 2 sheet mills, 20" x 34"; 2 pickling tanks. Fuel, gas, coal and coke.

Product: steel ingots; alloy steel ingots; steel plates and sheets for springs, saws, cutlery, etc., and auto and aeroplane steel; annual cap., 13,500 tons ingots (4,500 tons electric, 9,000 tons crucible); 10,000 tons rolled products.

JOHNSON (Isaac G.) & CO., Spuyten Duyvil, New York, N. Y.

Inc. 1902 in New York. Capital stock: com. \$1,000,000; pref. 6% cum. \$1,000,000.

Elias M. Johnson, P.; Isaac B. Johnson, V. P.; James W. Johnson, Sc.; Gilbert H. Johnson, T.

Works at Spuyten Duyvil, N. Y.: 2 A. O. H. fur. (8-ton); 4 Tropenas converters (2-ton); first converter steel made June 1, 1903; 4 cupolas. Fuel, coal, oil and coke. Machine shop for own use.

Product: general machinery castings for sale and special electric metal of high permeability. Annual cap., 2,500 tons open hearth steel castings, 5,000 tons converter castings.

JOLIETTE STEEL CO., Ltd., Joliette, P. Q., Canada.

Inc. April 6, 1916 in Dominion of Canada. Capital stock: com. \$100,000.

Kennedy Stinson, P.; at 903 Read Bldg., Montreal. J. A. Guibault, V. P.; P. H. Desrosiers, Sc. & T.; at Joliette.

Works at Joliette, P. Q., Canada: f. o. June 15, 1916; 1 side blown converter (2-ton); one cupola. Fuel, coke. (Formerly owned by Joilette Steel & Iron Foundry, Ltd.; acquired by Joliette Steel Co., Jan., 1916). Will install 5-ton electric fur. annual cap., 4,500 tons.

Product: light steel castings for sale and own use; alloy steel castings; annual cap., 2,000 tons.

JONES & LAUGHLIN STEEL CO., Third Ave. & Ross St., Pittsburgh, Pa.

Inc. 1902 in Pennsylvania. Capital stock: com. \$30,000,000; bonds \$20,258,000.

B. F. Jones, Jr., P.; Willis L. King, V. P.; William Larimer Jones, V. P. & G. M.; W. C. Moreland, Sc.; Charles A. Fisher, A. P.; J. C. Watson, T.; W. J. Creighton, C.; J. A. Doyle, A.; S. E. Hackett, G. M. S.; F. W. Ochsenhirt, Jr., P. A.

Sales offices:

Boston, A. B. Marble, 131 State Street.

Buffalo, C. S. Bradley, White Building.

Chicago, Ralph J. Stayman, Lake and Canal Streets (Warehouse).

Cincinnati, Boyden Kinsey, Union Trust Co. Bldg.

Cleveland, E. A. France, Rockefeller Bldg.

Detroit, F. D. Heath, Penobscot Bldg.

New York, H. F. Holloway, 165 Broadway.

Philadelphia, G. C. Fogwell, Commercial Trust Bldg.

Pittsburgh, A. C. Pollock, Jones & Laughlin Bldg.

St. Louis, E. D. Batchelor, Boatmen's Bank Bldg.

San Francisco, Wm. Best, Jr., Crocker Bldg.

Seattle, Jesse K. Barker, L. C. Smith Bldg.

Washington, Ralph T. Rowles, Woodward Bldg.

Product: bessemer and basic pig iron; steel ingots; blooms, slabs, billets, sheet bars; skelp, plates, beams, channels, angles, tees, zees, sheet piling, rounds, squares, ovals, flats, hexagons, hoops, bands, special shapes, agricultural shapes, tie plates, concrete bars, steel mine ties, light rails and connections; structural

work (columns, girders, trusses, plate work, steel barges); wire, wire nails and wire products; tinplates and black sheets (tin mill sizes); railroad spikes, boat spikes and rivets; power transmission machinery; cold-rolled shafting, axles, shapes and finger bars; cold drawn hexagons, flats, squares and rounds; forgings; tubular products. Total annual capacity: 2,100,000 tons pig iron; 2,640,000 tons steel ingots; 2,075,000 tons finished hot rolled products.

Aliquippa Works, Woodlawn, Beaver Co., Pa.: Blast Furnaces:

No.	Present size.	Built	First blown in	Relined
1	90' x 22'	1907-09	Dec. 1, 1909	1915
2	90' x 22'	1907-10	Feb. 14, 1910	1918
3	90' x 22'	1907-10	April 12, 1910	1918
4	90' x 22'	1907-11	Oct. 1, 1912	1916
5	90' x 22'	1919	Sept. 8, 1919	—

19 hot blast stoves (100' x 22'); 10 steam blowing eng. (360,000 cfm.); 52 water-tube boilers, 19,960 H. P.; 3 Heyl & Patterson double-strand pig casting mach.; Dwight & Lloyd sintering plant for sintering flue dust, annual cap., 130,000 tons. Beehive coke: Lake ore. Gray iron foundry, annual cap., 2,000 tons. Product: bessemer and basic pig iron; annual cap., 900,000 tons.

Steel Plant and Rolling Mill: steel plant, const. begun June, 1909; f. o. Jan. 8, 1912; rolling mill, construction begun July, 1909; f. o. May 16, 1910; 4 Talbot B. O. H. fur. (250-ton); 3 Bessemer converters (20-ton) used also in duplexing; 2 cupolas; 2 metal mixers, (400-ton, 600-ton); 3 cont. heat. fur.; eight 4-hole soaking pits; 40" 2-h. 1-st. blooming; 21" 2-h. 6-st. and 18" 2-h. 6-st. cont. billet and bar; 21" 2-h. 4-st. and 18" 2-h. 8-st. cont. sheet bar and skelp; 10" 2-h. skelp with 8-st. horizontal and 3-st. vertical; 12" to 9" cont. wire rod mill with 16-st. 2-h.; 69 sheet and pair fur.; 32 black plate (tin) mills (six 28" x 28 $\frac{1}{4}$ ", nineteen 28" x 32", seven 28" x 36"); 10 trains 24" tin mill cold rolls 3-st. to each train; 12 box annealing fur.; 5 Mesta pickling mach.; 51 tinning stacks for coke tinplates; 334 wire drawing blocks for wire from $\frac{5}{8}$ " to 18 gauge; 216 wire nail mach.; 4 staple mach.; 125 barbed wire mach.; 8 wire fence mach.; 6 galv. pans; 2 butt-weld fur. for pipe $\frac{1}{8}$ " to 3"; 2 lap-weld fur. for pipe 2" to 16"; 1 galv. pot. Fuel, coal, prod. gas and nat. gas. Product and annual cap.: 900,000 tons steel ingots (320,000 tons bessemer, 580,000 tons basic open hearth); 600,000 tons blooms, billets and slabs, 150,000 tons sheet and tinplate bars; 130,000 tons black plate for tinning; 140,000 tons skelp, 255,000 tons wire rods, 2,700,000 base boxes coke tinplates, 200,000 net tons plain wire, 110,000 net tons galv. wire, 1,300,000 kegs wire nails, 55,000 net tons barbed wire, 12,000 net tons wire fencing; 180,000 tons black pipe, 20,000 tons galv. pipe.

Pittsburgh Works, Pittsburgh, Pa. Blast Furnaces:

Furnace	Present size	Built	First blown in	Relined
Eliza 1	95' x 22'	1888-9	May, 1889	1918
" 2	95' x 22'	1898-9	Sept., 1899	1918
" 3	95' x 22'	1900	Jan., 1901	1917
" 4	95' x 22'	1899-00	May, 1900	1916
" 5	92'7 $\frac{1}{2}$ " x 22'	1903	April, 1904	1917
" 6	92' x 22'	1917	May, 1917
Soho 1	85' x 19'	1872	Nov., 1872	1918

Twenty-eight 2-pass hot blast stoves (eight 104' x 21', nine 108' x 22', ten 100' x 22', one 118' x 22'); 18 steam blowing eng. (498,000 cfm.); 82 water-tube boilers, 24,320 H. P.; 3 Heyl & Patterson double-strand pig casting mach.; Dwight & Lloyd sintering plant for flue dust, ore and scale, annual cap., 60,000 tons; 7 slag granulating pits. Beehive and by-product coke: Lake ore. Product: bessemer and basic pig iron; annual cap., 1,200,000 tons.

Steel Plant and Rolling Mill: steel plant blt. 1886; f. o. Aug. 19, 1886; rolling mill, blt. 1852; 25 B. O. H. fur. (four 30-ton, two 40-ton, ten 50-ton, four 250-ton, five 200-ton); 2 A. O. H. (25-ton); 4 Bessemer converters (9-ton); 6 cupolas; 3 metal mixers (two 250-ton, one 1,300-ton); 27 heat. fur. (one 3-d., seven 4-d., 18 cont., 1 special); 64 soaking pits (twenty-four 8-ingot, forty 4-ingot); 40" 3-h. 1-st. blooming; 38" 2-h. 1-st. blooming; 28" 2-h. 1-st. blooming; 28" 3-h. 1-st. billet; 16" 2-h. 8-st. cont. billet; 12" 3-h. 4-st., 12" 3-h. 4-st., 9" 3-h. 4-st., three 8" 3-h. 4-st., 8" 3-h. 5-st., 10" 3-h. 4-st. merchant; 16" 3-h. 3-st.; 22" 3-h. 2-st. bar; 30" 3-h. 4-st.; 28" 3-h. 4-st.; 16" 3-h. 3-st. structural; 14" 2-h. 4-st. roughing and 12" 2-h. 4-st. finishing; 14" 2-h. 5-st. and 13" 2-h. 6-st.; 10" 2-h. 10-st.; 14" 2-h. 4-st. and 10" 2-h. 4-st.; 78" sheared plate mill with 2-h. roughing and 3-h. finishing stand; 108" 2-h. 1-st. sheared plate mill; 128" 3-h. 1-st. sheared plate mill; 26" x 42" universal plate mill attached to structural mill; spike department. Fuel: coal, coke oven, prod. and natural gas. Replacing 108" sheared plate mill with 43" universal plate mill, annual cap., 180,000 tons to be completed, Sept., 1920.

Product and annual cap.: 1,740,000 tons ingots (500,000 tons bessemer; 1,220,000 basic and 20,000 tons acid open hearth); 10,000 tons acid open hearth castings; 10,000 tons gray iron and 800 tons brass castings for own use; 1,300,000 tons blooms, billets and slabs; 1,550,000 tons hot rolled products as follows: 36,000 tons light rails, 385,000 tons heavy and 51,000 tons light structural shapes, 44,000 tons universal and 350,000 tons sheared plates, 549,000 tons merchant bars, 17,000 tons hoops, 75,000 tons skelp, 33,000 tons spike, chain, bolt, nut and rivet rods, 10,000 tons tie plates; 400,000 kegs railroad spikes, 210,000 net tons cold finished steel.

The company owns iron ore mines on Mesabi, Gogebic and Menominee Ranges, annual cap., 3,000,000 tons. It also owns 1,820 bee-

hive coke ovens at Pittsburgh Works, annual cap., 1,200,000 net tons coke; 488 rectangular waste heat coke ovens, annual cap., 525,000 net tons coke at Aliquippa Works, and 300 Koppers by-product coke ovens (240 completed), annual cap., 1,300,000 net tons coke at Pittsburgh Works with by-product recovery plant and Koppers benzol plant; annual cap., 7,000,000 gals. light oil. Company also owns limestone quarries at Blairfour, Pa. and Martinsburg, W. Va.; annual cap., 400,000 tons.

JONES (The D. F.) MFG. CO., Ltd., Gananogue, Ontario, Canada.
Inc. 1852 in Province of Ontario.

W. Wallace Jones, P.; at Toronto, Canada. Ford Petch, Sc. & T.; W. T. Sampson, G. M.; D. F. Jones, M.; D. Bain, G. S.; C. A. Watt, G. S. M.; at Gananogue.

Selling agents: H. G. Rogers, Ltd., St. John, N. B.; F. Bacon & Co., Montreal; David Phillip, Winnipeg; W. O. Webster, Vancouver. Works at Gananogue: (operated under the Ontario Steel Products, Ltd.); hot rolls; first rolled products made 1885.

Product: shovel blanks for own use only. Company manufactures shovels, spades, scoops, draining tools, etc.

Josephine Furnace & Coke Co., Cleveland, Ohio, see 1916 Directory, p. 178, taken over by The McKinney Steel Co., Jan., 1918.

JOYCE-CRIDLAND CO. (The), Dayton, Ohio.

Inc. Nov. 23, 1893 in Ohio. Capital stock: com. auth. \$125,000, issued \$75,000; pref. stock, 6% cum. auth. \$125,000, issued \$115,000.

William F. Bippus, P. & T.; J. M. Switzer, V. P.; H. W. Pearce, Sc.; B. A. Rhoads, G. S.; Charles D. Derby, G. S. M.; J. W. Osborn, P. A.

Works at Dayton: first steel made 1900; 3 crucible fur. (12-pot) dismantled in Oct., 1916; 1 Snyder electric fur. (2½-ton); one ham. (800-lb.); 1 hydraulic forging press (100-ton). Machine shop for own use.

Product: steel castings for sale and own use; annual cap., 1,100 tons.

JUDSON MANUFACTURING CO., 819 Folsom St., San Francisco, Cal.

Inc. 1882 in California. Capital stock: com. auth. \$2,000,000, issued \$1,966,500.

Henry E. Bothin, P. & T.; William T. Summers, V. P.; R. G. Girdwood, Sc.; W. L. Booth, G. M.; Carlos J. Maas, Business M.; at San Francisco. Dion L. Johnson, G. S.; at Emeryville, Cal.

Selling agents: Hilton-Pike-Oakley Co. at Seattle and Portland. Brand: "Judson."

Works at Emeryville, Oakland, Cal.: blt. 1882; three 30-ton B. O. H. fur.; blt. 1916-17; 5 oil heat. fur. (one 3-d., four 4-d.); 10" 3-h. 5-st.; 10" 3-h. 4-st. guide; 16" 3-h. 3-st.; 16" 3-h. 3-st. bar mills;

universal plates rolled on 16" mill, 7" to 24" wide; 1 plate heat. fur. Open hearth Dept. at San Francisco, formerly leased from West Coast Iron Co. Lease given up. Plant returned to owner, see West Coast Iron Co.

Product: merchant bar iron and steel, structural and agricultural shapes, bolts and spikes, cold drawn shafting and iron and steel castings; annual cap., 55,000 tons ingots; 40,000 tons finished iron and steel, 3,600 tons bolts and spikes, 18,000 tons bridge and structural work, 1,000 tons cold drawn shafting and 2,000 tons gray iron castings.

JUNIATA FURNACE & FOUNDRY CO., 30 West Girard Ave., Philadelphia, Pa.

Inc. July 20, 1891 in Pennsylvania. Capital stock: com. auth. \$250,000; bonds \$50,000.

Alfred Marshall, P.; Edward E. Marshall, V. P.; Henry P. Arbendz, Sc.; F. Warren Marshall, T.; W. S. Raudenbush, G. M.

Sales and purchasing agents: F. W. Marshall & Co., Pennsylvania Bldg., Philadelphia.

Brands: "Marshall" and "Juniata."

Marshall Furnace, Newport, Pa.: 1 stack, 60' x 14'4"; blt. 1871; last remod. 1908; relined 1918; 2 Roberts 3-pass stoves (70' x 18'), 2 Durham pipe stoves; 2 steam blowing eng. (31,600 cfm.); 3 water-tube boilers, 450 H. P.; 4 flue boilers, 600 H. P. Coke and anthracite coal; Lake and local ore. Company owns brown hematite iron ore mine at Dillsburg, York Co., Pa. (not operating).

Product: foundry pig iron; spiegeleisen and ferro-manganese; annual cap., 30,000 pig iron, or 12,000 tons spiegeleisen, or 7,500 tons ferro-manganese.

KANSAS CITY BOLT & NUT CO. (The), Sheffield Station, Kansas City, Mo.

Inc. 1888 in Missouri. Capital stock: com. \$751,000; pref. \$400,000. George T. Cook, P.; at 701 Finance Bldg., Kansas City. Solomon Stoddard, V. P. & G. M.; Lewis L. Middleton, Sc.; Howard R. Warren, T. & P. A.; Daniel D. Neville, Works M.; Ernest Baxter, G. S. M.; at Sheffield Station.

Sales offices:

Dallas, W. D. Jenkins, 1112 Praetorian Bldg.
Denver, Duncan Bond, Colorado Nat. Bank Bldg.
Houston, W. D. Jenkins, 810 Carter Bldg.
Los Angeles, Hughson & Merton, 1202 Marsh Strong Bldg.
New Orleans, W. D. Jenkins, Whitney-Central Bldg.
New York, H. S. Schroeder, 52 Vanderbilt Ave.
Portland, Hughson & Merton, 522 Oregon Building.
St. Paul, Paul Kalman, Merchants Nat. Bank Bldg.
Salt Lake City, E. C. Coffin, Dooley Bldg.
San Francisco, Hughson & Merton, 9 Main St.

Works at Sheffield Station, Kansas City: blt. 1887-88; f. o. Jan., 1889; 4 heat. fur. (4-d.); 10" Belgian with 16" 3-h. 3-st. roughing, 10" 3-h. 3-st., 10" 2-h. 1-st. finishing; 10" bar mill with 3-st. 3-h. and 1-st. 2-h.; 2 ham. (800-lb. and 1,500-lb.). Fuel, oil. Bolt and nut factory. Building three 50-ton B. O. H. fur.; cont. reheat. fur.; 22" 5-st., 12" 4-st. cont. roughing, 10" 5-st. finishing; annual cap., 90,000 tons ingots, 75,000 tons merchant and concrete bars.

Product: merchant bar and bolt iron; reinforcing bars; bolts $\frac{1}{2}$ " and larger, track spikes $\frac{9}{16}$ " x $5\frac{1}{2}$ ", nuts $\frac{1}{2}$ " and larger, car forgings, oil field forgings, pole line hardware; annual cap., 40,000 tons rolled products, 9,000 kegs track spikes, 10,000 kegs track bolts, 150,000 kegs machine, carriage and lag bolts, 50,000 kegs nuts, 5,000 tons forged products, 1,000 tons pole line hardware.

KANSAS CITY SOUTHERN RAILWAY CO. (The), Kansas City, Mo.

Works at Pittsburg, Kansas: blt. 1912; f. o. Aug., 1912; 2 oil-fired scrap heat. fur. (2-d.); 10" 2-h. 1-st. Ajax improved reclaiming rolls. Fuel, oil. Idle.

Product: bars and flats for own use, annual cap., 1,800 tons.

KELLY & JONES CO. (The), Pittsburg, Pa.

Inc. May 7, 1888. Capital stock: com. \$3,000,000.

John T. Kelly, P.; J. S. Mattimore, G. S. M.; at 13 Park Row, N. Y. Hugh McK. Jones, V. P.; Joseph A. Kelly, Sc.; George M. Jones, T.; at 135 Water St., Pittsburg. John H. Liddell, A.;

F. E. Johnson, G. S.; George T. Foster, P. A.; A. W. McKenney, A. T.; at Greensburg, Pa.

Sales offices: Chicago, Cincinnati, New York, St. Louis and San Francisco.

Works at Greensburg: one 1-ton converter, added 1916, f. o. Sept. 2, 1916.

Product: steel castings for own use and for sale; annual cap., 1,000 tons.

Company makes iron pipe fittings, brass and iron valves, cocks, etc.

Kelly (G. A.) Plow Co., Longview, Texas, see 1916 Directory, p. 180. Crucible steel furnaces dismantled in 1917.

KELLY NAIL & IRON CO. (The), Ironton, Ohio.

Inc. Nov. 11, 1882 in Ohio. Capital stock: com. \$300,000.

Oscar Richey, P., G. M., G. S. M. & P. A.; I. P. Blanton, A. P.; T. J. Hayes, Sc. & T.; at Ironton. J. Austin Kelly, V. P.; at Ashland, Ky.

Brands: "Sarah" for pig iron; "The Ironton Nail" for nails.

Product: pig iron, steel cut nails and spikes, wire nails, staples, plain and galvanized wire, and barbed wire.

Sarah Furnace, Ironton: 1 stack, 67' x 14' 6"; blt. 1877; last remod. 1910; 4 stoves (2 Whitwell; 2 Amsler); 2 steam blowing eng. (16,000 cfm.); 3 water-tube and 1 flue boiler, 745 H. P. West. Va. coke: Lake ore. Product: bessemer pig iron, annual cap., 50,000 tons.

Kelly Nail Works, Ironton: blt. 1883; f. o. Nov. 1, 1883; two 4-d. prod. gas heat. fur.; 2 forge fires; 22" nail plate rolls; 42' wire drawing blocks, 61 wire nail machines, 120 cut nail machines. Fuel, nat. and prod. gas. Machine shop for own use. Galvanizing plant with one pot for galvanizing wire with an annual cap. of 12,000 tons. Product: steel cut nails and spikes, wire nails, staples, plain and galvanized wire and barbed wire. Annual cap., 250,000 kegs of cut nails, 30,000 tons of wire, 8,000 tons of barbed wire and 700,000 kegs of wire nails.

Company also owns coal mine and limestone quarry not operated at present.

KENNEDY & SONS, Ltd. (The William), 1114 First Ave. West, Owen Sound, Ontario, Canada.

Inc. May 6, 1896 in the Province of Ontario, Canada. Capital stock: com. auth. \$95,000, issued \$88,200.

M. Kennedy, Sr., P. & G. M.; M. Kennedy, Jr., 2 V. P.; T. D. Kennedy, Sc. & T.; at Owen Sound. D. J. Kennedy, 1 V. P.; at Medicine Hat, Alberta.

Sales office: Owen Sound, Ont.

Works at Owen Sound, Ontario: blt. 1899-1900; f. o. May, 1900; 1 Tropenas converter (2-ton); 3 cupolas. Gray iron foundry and machine shop. Fuel, coke.

Product: steel castings for sale; propellers, water-wheels, windlasses, winches, trussed rail joints; gray iron and semi-steel castings; annual cap., steel castings 1,200 tons, gray iron 400 tons, brass 10 tons.

Works at Collingwood acquired Nov., 1915, sold to Canadian Western Steel Corporation.

Kennedy-Stroh Corporation, Oakmont, Pa., see 1916 Directory, p. 181.

Lawrence Steel Casting Dept. was sold to the Stroh Steel Hardening Process Co., Pittsburgh, Pa., March 1, 1916. The main shops and foundries at Oakmont, Pa., were sold to the Edgewater Steel Co., Oct. 1, 1916.

KEOKUK ELECTRO-METALS CO., Keokuk, Iowa.

Inc. Sept. 1, 1915 in Iowa. Capital stock: com. auth. \$250,000, issued \$149,200.

G. E. Weissenburger, P. & G. M.; L. E. Othmer, S.; at Keokuk. M. H. Christopherson, V. P.; John Dillon, Sc., T. & G. S.; at 1518 Corn Exchange Bank Bldg., Chicago, Ill.

Selling agents: Walter Wallingford & Co., at Chicago, Cincinnati and Pittsburgh; Matthew Addy Co., at Chicago and Cincinnati; Richard Jensen Co., Los Angeles.

Works at Keokuk: blt. 1916; f. o. April, 1916; 4 arc electric fur. Hydro-electric power from the Mississippi River Power Co.

Product: ferro-silicon, bessemer ferro-silicon and silvery pig iron, annual cap., 20,000 tons.

KEYSTONE IRON & STEEL WORKS, 1125 Merchants National Bank Bldg., Los Angeles, Cal.

Inc. 1917 in California. Capital stock: com. \$500,000.

H. L. Greswold, P. & G. M.; George W. Moore, V. P. & T.; F. R. Dimmuth, Jr., Sc.; L. A. Campbell, G. S.; J. A. Harmon, G. S. M.; R. A. Lewis, P. A.

Works at 973 North Main St. (leased; owned by Richard Livingston, Los Angeles) and at 3700 Santa Fe Ave. (owned), Los Angeles. Installing 6-ton electric furnace, annual cap., 7,200 tons steel castings (for own use and for sale), to be operated about July 1, 1920. At present manufacture gray iron, semi-steel and brass castings, cast iron lamp posts, fire hydrants, pipe fittings, oil well machinery and general foundry and machine work.

KEYSTONE STEEL & WIRE CO., South Bartonville, Peoria, Ill.

Inc. July 20, 1907 in Illinois. Capital stock: com. auth. \$3,500,000, issued \$3,373,700; pref. 7% cum. auth. \$3,500,000, issued \$1,526,700; bonds \$3,000,000.

P. W. Sommer, P. & G. M.; W. H. Sommer, V. P. & G. S.; H. G. Moore, V. P. & G. S. M.; B. L. Sommer, Sc. & T.; F. J. Schlatter, A.; A. J. Snyder, C.; E. G. Schaeffer, P. A.

Works at South Bartonville, Peoria, Ill.: blt. 1901; first steel made May 20, 1917; first rolled products June 15, 1917; 3 B. O. H. fur. (75-ton); 1 Morgan cont. heat. fur.; 3 soaking pits (4-hole); 35" 2-h. 1-st. blooming; 1 Morgan double strand cont. wire rod mill 16-st. with 12" 2-h. roughing, 10" 2-h. intermediate and 10" 2-h. finishing; 165 wire drawing blocks for wire 2 to 17 gage; 21 wire nail mach.; 44 barbed wire mach.; 33 wire fence mach.; 4 galvanizing pans. Fuel, coal, and gas.

Product: steel ingots, billets, wire rods, wire, wire nails, barbed wire, wire fence, bale ties, gates, etc.; annual cap., 100,000 tons ingots, 100 tons steel castings; 110,000 tons blooms and billets; 100,000 tons wire rods, 80,000 net tons plain wire, 60,000 net tons galvanized wire, 120,000 kegs nails, 22,500 net tons barbed wire, 43,500 net tons wire fencing. -

Kiefaber, P. W., Owner, Philadelphia, Pa.

Brand: "Leesport."

Leesport Furnace, Leesport, Pa.: 1 stack, 70' x 16'; blt. 1852, f. o. 1853; rebld. 1900, relined 1918; two 3-pass side combustion stoves (60' x 18'); 1 steam blowing eng.; 14 cylindrical boilers, 1,400 H. P. Conn. coke; Lake ore, cinders. (Formerly owned by Leesport Furnace Co.)

Product: foundry and forge pig iron, annual cap., 22,500 tons.

KILBY CAR & FOUNDRY CO., Anniston, Ala.

Inc. 1898 in Alabama. Capital stock: com. \$200,000.

Thomas E. Kilby, P.; Whitfield Clark, V. P.; William A. Darden, Sc. & T.

Works at Anniston, Ala.: blt. 1898; hot rolls added 1916-17; f. o. Feb. 23, 1917; 1 squeezer; three 3-d. scrap fur.; four 4-d. scrap fur.; 22" 3-h. 1-st. and 10" 3-h. 4-st. bar mills; 3 steam ham. (5,000-lb.). Fuel, coal.

Product: iron or steel merchant bars, forged axles, gray iron castings; annual cap., merchant bars, 11,600 tons; car axles, 2,000 tons; gray iron castings, 7,000 tons.

KINITE CO., 1338 St. Paul Ave., Milwaukee, Wis.

Inc. July, 1918 in Wisconsin. Capital stock: com. \$25,000.

D. D. Tompkins, P.; at 1338 St. Paul Ave., Milwaukee.

A. W. Berresford, V. P.; H. F. Vogt, Sc. & T.; L. L. Tatum, M.; N. S. Hopkins, P. A.; at 37 S. 12th St., Milwaukee.

Works at 1338-40 St. Paul Ave. (leased; owned by Cutler-Hammer Manufacturing Co.): blt. 1918; three 60-pot crucible fur. (idle); f. o. Oct. 15, 1918; one 250-lb. Snyder electric fur., annual cap. 110 tons, f. o. Mar. 2, 1920.

Product: alloy steel castings for punches and dies; annual cap., 110 tons.

Kiski Steel Casting Co., Avonmore, Pa., see 1916 Directory, p. 183, was acquired by the Fahnestock Mfg. Co., Avonmore, Pa., March 1, 1916.

KITTANNING IRON & STEEL MFG. CO., foot of 32nd St., Pittsburgh, Pa.

Inc. July, 1894 in Pennsylvania. Capital stock: com. \$400,000. Frank C. Neale, P.; Charles F. Blue, V. P.; D. R. Wilson, T.; at Pittsburgh. Lamont Bixler, Sc.; Harry Heffrin, G. S.; at Kittanning, Pa.

Brands: "Rebecca" and "Kittanning."

Rebecca Furnace, Kittanning, Pa.: 1 stack, 80' x 18'; blt. 1906-08; f. o. Aug. 12, 1912; 4 McClure stoves (one 80' x 20', one 80' x 18', two 65' x 18'); 3 steam blowing eng. (65,000 cfm.); 6 water-tube boilers, 3,000 H. P.; 1 single-strand Heyl & Patterson pig casting machine. Coke: Lake ore. Product: basic pig iron; annual cap., 100,000 tons.

Kittanning Rolling Mill, Kittanning, Pa.: blt. 1848, rebt. 1880; 31 single puddling fur.; 1 squeezer; 22" 3-h. 1-st. muck mill. Fuel, nat. gas. Product: muck bar; annual cap., 20,000 tons.

Company owns 1,200 acres of coal land.

KNOXVILLE IRON CO., Knoxville, Tenn.

Inc. 1868 in Tennessee. Capital stock: com. \$1,000,000.

Morrow Chamberlain, P.; at Chattanooga, Tenn. W. H. Van Benschoten, V. P.; at West Park, N. Y. O. A. Brown, T.; W. O. Schaad, Sc. & A. T.; W. P. Davis, G. M.; Edward Jones, G. S.; E. D. Attix, A. G. M. & P. A.; at Knoxville, Tenn.

Selling agents: Steel Producers Export Corp., 120 Broadway, New York.

Works at Lonsdale, Knoxville, Tenn.: blt. 1902-03; f. o. Mar., 1903; 1 double and 10 single puddling fur.; 14 cinder bottom busheling fur.; 1 squeezer; six 4-d. heat. fur.; 6 gas producers; 20" 3-h. 2-st. muck; 16" 3-h. 1-st. bar; 9" 3-h. 2-st. Belgian with 16" roughing and 9" finishing; 12" roughing; 8" 3-h. 2-st. guide mill. Chain plant; 10 large forges for chain up to 2¼"; 2 forges for smaller chain; 3 forges for small sized chain. Fuel, coal, prod. gas and oil.

Product: muck and scrap bar, light structural shapes, merchant and concrete bars, chains; annual cap., 12,000 tons muck and scrap bar, 5,000 tons light structural shapes, 35,000 tons merchant and concrete bars, 1,000 tons anchor and dredge chain.

KOKOMO STEEL & WIRE CO., Citizens National Bank Bldg., Kokomo, Ind.

Inc. 1901 in Indiana. Capital stock: com. \$2,000,000; pref. auth. \$150,000, none issued.

A. A. Charles, P.; A. V. Conradt, V. P.; J. E. Frederick, Sc. & G. M.; G. W. Charles, T.; Charles L. Hummell, A.; J. V. Wiesman, S.; S. S. Shambaugh, G. S. M.; G. L. Rathel, P. A.

Works at Kokomo, Ind.: blt. 1900; 3 B. O. H. fur. (80-ton), blt. 1913-14; f. o. Feb. 6, 1914; three 4-hole soaking pits; 34" 2-h. 1-st. reversing blooming mill; Garrett rod mill; 2 box annealing fur.; 6 hand-pickling tanks; 150 wire drawing blocks for wire 0 to 20 gage; 118 wire nail mach.; 56 barbed wire mach.; 29 wire fence mach.; 4 galvanizing pans.

Product: ingots, blooms and billets, wire rods, plain wire, wire nails, barbed wire, wire fence, galvanized wire; annual cap., 120,000 tons steel ingots, 150,000 tons blooms and billets, 100,000 tons wire rods, 80,000 net tons plain wire, 45,000 net tons galvanized wire, 1,000,000 kegs wire nails, 18,000 net tons barbed wire, 25,000 net tons wire fencing.

LA BELLE IRON WORKS, South 3rd St., Steubenville, Ohio.

Inc. Dec. 3, 1875 in West Virginia. Capital stock: com. auth. \$10,000,000, issued \$9,915,400; pref. 8% cum. auth. \$10,000,000, issued \$9,915,400; bonds \$2,477,000.

R. C. Kirk, P.; H. D. Westfall, V. P. & G. S. M.; D. A. Burt, V. P. & T.; W. B. Higgins, Sec.; W. T. Burt, A.; G. B. LeVan, G. M.; R. M. Rice, P. A.

Sales offices:

Boston, George K. Tinker, 452 John Hancock Bldg.

Chicago, Wilmer Wickersham, 1849-50 Peoples Gas Bldg.

Detroit, G. O. Tucker, 1221 Book Bldg.

El Paso, Texas, Lippincott, Beall & Co., 604 Mills Bldg.

Kansas City, Mo., Hoyle Jones, 605 R. A. Long Bldg.

New Orleans, D. M. Montgomery, Tulane-Newcomb Bldg.

New York, A. Schroeder, 39 Cortland St. and Ely & Williams Co., 257 Broadway.

Philadelphia, S. H. Truitt, Land Title Bldg.

Pittsburgh, G. C. Shidle, 1317-18 Oliver Bldg.

San Francisco, W. A. Taylor, Rialto Bldg.

Seattle, Lyman T. Banks, L. C. Smith Bldg.

Brands: "La Belle," "La Belle Blue," "La Belle O. H.," "La Belle Galvanized."

Steubenville Works, Steubenville, Ohio: 2 stacks, 90' x 20'; No. 1, orig. blt. 1865; last rebt. 1901-03; No. 2, blt. 1903-04, f. o. Oct. 31, 1904; 8 McClure stoves (85' x 21'); 3 steam blowing eng. (120,000 cfm.); 34 water-tube boilers, 17,000 H. P., serve entire plant; 2 Heyl & Patterson single-strand pig casting machines. By-product coke: Lake ore. Product: basic pig iron, annual cap., 260,000 tons.

Steel Works and Rolling Mill: orig. blt. 1855; 11 B. O. H. fur. (63-ton); 1 metal mixer (300-ton); five 4-hole soaking pits; 15 heat. fur. (eight 4-d., three 5-d., 4 cont.); 84 gas prod.; 45" 2-h. 1-st. reversing blooming; 23" 2-h. 5-st. and 23" 3-h. 1-st. universal plate and bar; 21" 3-h. 2-st. and 21" 2-h. 1-st. grooved skelp mill; two 3-h. sheared plate mills (32" x 84", 30" x 72"); 28" x 60" x 54" 2-h. and 30" x 72" 3-h. jobbing plate mills; eight hot black sheet mills (two 26" x 44", four 26" x 38", two 26" x 36"); 4 trains cold rolls (24" x 48"); 7 double box annealing fur.; 2 pickling mach.; 4 galv. pots; 2 butt-weld fur. for pipe 1/4" to 2 1/2"; 2 lap-weld fur. for pipe 2" to 12 1/2"; 2 galv. pots. Fuel, prod. gas and coke oven gas. Product and annual cap.: steel ingots (420,000 tons); slabs, blooms

and billets (350,000 tons), sheet and tinplate bars (50,000 tons); sheared plates (130,000 tons), black sheets (60,000 tons), skelp (48,000 tons), other rolled products (62,000 tons), black pipe (110,000 tons), galvanized pipe (45,000 tons).

Wheeling Works, Wheeling, W. Va.: orig. blt. 1852; four 4-d. regenerative gas heat. fur.; 6 gas prod.; 22" 3-h. 3-st. and 21" 2-h. 3-st. skelp mills; 120 cut nail mach. Fuel; prod. gas. Product: grooved skelp and nail plate, cut nails and tacks; annual cap., skelp 40,000 tons; cut nails, 167,000 kegs (100-lb.).

IRON ORE, COAL AND MISCELLANEOUS PROPERTIES.

The La Belle Iron Works controls the Pitt Iron Mining Co., which operates the Miller and Wacootah Mines in the Mesabi Range with an annual cap., of 700,000 tons. The company owns the capital stock of the La Belle Coke Co. with 325 acres of coal lands and 200 beehive coke ovens at La Belle, Fayette Co., Pa., annual cap., 140,000 net tons of coke. It owns and operates 94 Koppers by-product coke ovens at Follansbee, W. Va.; annual cap., 425,000 net tons coke. By-product recovery plant and Koppers benzol plant with an annual cap. of 2,100,000 gals. light oil.

The company also owns 560 acres of coal lands in Jefferson Co., Ohio, and 7,050 acres of coal lands in Brooke Co., W. Va., with main hoisting shaft in the Steubenville Works, annual cap., 200,000 tons; also 400 acres of coal lands at Wheeling, W. Va., and 900 acres in Ohio County, W. Va. The company owns the capital stock of the Consumers Mining Co. with 3,200 acres of coking coal lands at Harmarville, Allegheny Co., Pa.

The company owns about 100 acres of undeveloped limestone lands in Berkeley Co., W. Va. It also controls the La Belle Steamship Co., which owns the steamship "La Belle," with a carrying capacity of 10,000 tons of iron ore.

It owns 7 natural gas wells in Jefferson Co., Ohio and 38 producing oil wells in Brooke Co., W. Va.

LACKAWANNA STEEL CO., Lackawanna Bldg., Lackawanna, N. Y.

Inc. Feb. 15, 1902 in New York. Capital stock: com. auth. \$60,000,000, issued \$35,108,500; pref. 7% cum. auth. \$10,000,000, issued \$6,000 (treasury stock); bonds \$18,559,000.

—, P.; C. R. Robinson, V. P. & G. S. M.; George F. Downs, V. P. & G. M.; Fred F. Graham, Sec.; J. P. Higginson, T.; W. H. Dupka, C.; T. H. Mathias, G. S.; F. H. Burnett, P. A.

Sales offices:

Atlanta, J. E. Franks, 729 Candler Bldg.

Boston, H. L. Stevens, 40 Central St.

Buffalo, G. A. Hagar, 906 Marine Bank Bldg.

Chicago, J. L. Hench, C. & C. Bank Bldg.
Cincinnati, J. I. Stephenson, Front, Freeman & Sargent Sts.
Cleveland, J. C. Chandler, 1203 Citizens Bldg.
Detroit, C. H. Hobbs, 1208 Penobscot Bldg.
New York, C. A. Prendergast, 2 Rector St.
Philadelphia, William Breeden, 803 Morris Bldg.
St. Louis, G. C. Holmes, Pierce Bldg.
San Francisco, C. W. Pike Co., 22 Battery St.
Springfield, Mass., C. O. Churchill, 146 Fort Pleasant Ave.
Syracuse, Breo La Pierre, 301 Seitz Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Product: bessemer and foundry pig iron, bessemer and open hearth billets, sheet bars, heavy and light rails, structural shapes, sheet piling, splice bars, tie plates, rail joints, universal and sheared plates, merchant bars, shapes, railway spikes, bolts and nuts and benzol products.

Properties: Lackawanna Steel Works, Lackawanna, N. Y.

CAPITAL STOCK OF THE FOLLOWING COMPANIES:

The Lackawanna Iron and Steel Co.
Lackawanna Coal & Coke Co.
Buffington Water Co.
East Wheatfield Water Co.
Ellsworth Collieries Co.
Franklin Iron Co.
Lackawanna Steel Co. (of New Jersey).
Seneca Transportation Co.
South Buffalo Railway Co.
Ellsworth Land Co.

STOCK HOLDINGS IN THE FOLLOWING ORE COMPANIES:

Witherbee, Sherman & Co., mines at Mineville, N. Y.
Odanah Iron Co., Windsor and Cary Mines, Gogebic Range.
Verona Mining Co., Mikado Mines, Gogebic Range; Baltic, Bengal, Caspian, Fogarty, and Vivian Mines, Menominee Range.
Brotherton Mining Co., Brotherton Mine, Gogebic Range.
Sunday Lake Iron Co., Sunday Lake Mine, Gogebic Range.
Plymouth Mining Co., Plymouth Mine, Gogebic Range.
Hobart Iron Co., Elba, Minorca, and Yawkey Mines, Mesabi Range.
Hoyt Mining Co.
Corsica Iron Co., Corsica Mine, Mesabi Range.
Ontario Mining Co.
Negaunee Mine, $\frac{1}{2}$ interest in leasehold.

Lackawanna Steel Works, Lackawanna, N. Y. :

BLAST FURNACES

No.	Size	Built	First blast	Last relined	Center Combustion Stoves	
					No.	Size
1	87' x 17'	1901-02	Feb. 11, 1903	1917	4	83' x 18'
2	87' x 17'	1901-02	May 2, 1903	1917	4	83' x 18'
3	94' x 22'9"	1902-04	June 9, 1904	1917	4	133' x 22'
4	94' x 22'9"	1902-05	Jan. 21, 1905	1919	4	133' x 22'
5	94' x 22'9"	1902-05	Sept. 3, 1905	—	4	133' x 22'
6	94' x 22'	1902-06	May 1, 1906	1919	4	133' x 22'
7	94' x 22'	1906-07	Feb. 12, 1907	1918	4	109' x 22'
8	94' x 18'	1917-18	Mar. 27, 1918	—	4	110' x 22'
9	94' x 22'	1917-18	July 28, 1918	—	4	110' x 22'

Twenty-one gas and 6 steam blowing eng. (515,000 cfm.); 138 water-tube boilers (36,000 H. P.); 5 double-strand Heyl & Patterson casting machines; 2 rotary sintering kilns (annual cap., 25,000 tons). Conn. and by-product coke: Lake ore. Molten metal to Bessemer and Open Hearth Depts. Product: bessemer and basic pig iron; annual capacity, 1,440,000 tons. By-product Coke Plant: 469 by-product ovens (188 Otto-Hoffman and 281 Rothberg); tar and ammonia house; Otto benzol plant; annual capacity, 700,000 net tons coke, 2,000,000 gallons of light oil. There are now under construction 60 Semet-Solvay by-product ovens.

Steel Works: construction begun in 1902; first bessemer steel made Oct. 13, 1903, first open hearth steel, Sept. 26, 1904; four 10-ton Bessemer converters, used direct and also for duplex process with O. H. fur.; 8 cupolas for pig iron, 4 for spiegel; 2 mixers (one 250-ton, one 300-ton); 24 B. O. H. fur. (six 60-ton, eight 75-ton, eight 100-ton, two 200-ton tilting for duplexing); 96 gas prod.; 2 spiegel cupolas; 1,600-ton mixer. Gray iron, steel and brass foundry. Product and annual cap.: 1,840,000 tons bessemer and open hearth steel ingots, 1,500 tons steel castings, 6,000 tons gray iron castings, 30,000 tons ingot molds and stools, 300 tons brass castings for own use.

Rolling Mills: No. 1, f. o. Oct. 20, 1903; 7 four-hole soaking pits, 32" 2-h. 6-st. rail mill; No. 2, f. o. July 5, 1904; 4 cont. heat. fur.; 24" 3-h. 2-st. and 16" 3-h. 1-st. structural mill; No. 3, f. o. Sept. 15, 1904; 3 cont. heat. fur.; 24" 3-h. 3-st. structural mill; No. 4, f. o. Nov. 5, 1904; five 4-hole and one 1-hole soaking pits; 36" 2-h. 1-st. slabbing mill; No. 5, f. o. Nov. 5, 1904; six 4-d. heat. fur.; 48" universal plate mill convertible into 72" sheared plate mill; No. 6, f. o. Jan. 31, 1905; 2 cont. heat. fur.; 16" 3-h. 1-st., 12" 3-h. 3-st. and 12" 2-h. 1-st. merchant mill; No. 7, f. o. Nov. 27, 1905; seven 4-hole soaking pits; 40" 2-h. 1-st. reversing blooming mill; No. 8, f. o. Dec. 15, 1907; 18" 2-h. 10-st. cont. sheet bar and billet mill; No. 9, f. o. Sept. 5, 1911; cont. heat. fur.; 12" 2-h. 6-st. cont. roughing and four 10" 2-h. 2-st. finishing merchant bar and wire rod mills; No. 10, f. o. Feb. 5, 1919, cont. heat. fur.; 14" to 8" 2-h.

14-st. cont. merchant mill; No. 11, f. o. Oct. 25, 1916; cont. heat. fur.; 16" 2-h. 5-st. merchant mill. Product and annual cap.: 170,000 tons sheet bars and small billets; 500,000 tons rails, 225,000 tons structural shapes (140,000 tons heavy, 85,000 tons light), 150,000 tons sheared and universal plates, 277,000 tons merchant bars and wire rods, 19,000 tons bolt and spike rods.

Spike, Bolt & Nut Factory: f. o. Mar. 17, 1913; 4 spike mach., 2 bolt headers, 3 nut mach., 2 threading mach., nut tapping and threading mach.; 9 heat. fur. Product: railroad track spikes, track bolts and nuts, annual cap., 190,000 kegs (200 lb.).

AUXILIARY DEPARTMENTS.

Power Plants: No. 1, eight 1,000 H. P. gas engines, motor generators, air compressors, hydraulic pumps, etc.; No. 2, eight 2,000 H. P. gas engines and six 3,000 H. P. steam blowing engines; No. 3, eight 2,000 H. P. gas blowing eng.; No. 4, five 2,000 H. P. gas blowing engines; and there is also now under construction a new power station, which will be known as No. 2 Power Station, and will contain one 7,500 K. W. and one 12,500 K. W. turbo generator set, with all boilers and other auxiliaries.

Pumping Station No. 1: daily capacity 125,000,000 gallons.

Pumping Station No. 2: daily capacity 40,000,000 gallons.

Boiler Plants: No. 1, 16 Cahall and 10 Stirling boilers, 8,000 H. P.; No. 2, 80 Cahall boilers, 20,000 H. P.; No. 3, 32 Cahall boilers, 8,000 H. P.; No. 4, 20 Munoz boilers, 7,000 H. P.; Coke Oven Boiler House, 4 Cahall, 2 Stirling and 1 Erie City boilers, 2,200 H. P. Waste Heat Plant—No. 2 Open Hearth—10 B. & W. boilers, 3,000 H. P. Total H. P., 48,200.

SHOP SYSTEM.

System of shops for maintenance of plant's equipment is maintained, consisting of the following: machine, forge, boiler, bridge, pipe, pattern, carpenter, electrical, repair, and roll shops and storehouses. Foundries for iron, steel and brass castings. Annual capacity 6,000 tons iron castings, 30,000 tons molds and stools, 1,500 tons steel castings and 300 tons brass castings for own use.

ORE, COKE AND RAILWAY COMPANIES.

Lackawanna Coal & Coke Co., Wehrum, Pa., inc., Jan. 1, 1901. Capital stock (all owned by Lackawanna Steel Co.) \$500,000. Moses Taylor, V. P.; A. J. Singer, A. P.; at 2 Rector St., New York, N. Y. Fred F. Graham, Sc.; J. P. Higginson, T.; Herbert Melvin, A. T. & A. Sc.; W. H. Dupka, C.; F. H. Burnett, G. P. A.; W. E. Howes, T. Mgr.; at Lackawanna, N. Y. W. A. Luce, Mgr.; at Pittsburg, Pa. Geo. Lindsay, Supt.; at Wehrum, Pa.

- Owens 10,134 acres of unmined coal in Cambria and Indiana Counties, Pa., annual cap., 756,000 tons.
- Ellsworth Collieries Co., Ellsworth, Pa., inc. Jan. 31, 1907. Capital stock (all owned by Lackawanna Steel Co.) \$1,000,000; bonds outstanding Dec. 31, 1919, \$3,254,000.
- Moses Taylor, V. P.; A. J. Singer, A. P.; at 2 Rector St., New York, N. Y. Fred F. Graham, Sc.; J. P. Higginson, T.; Herbert Melvin, A. T. & A., Sc.; W. H. Dupka, C.; W. E. Howes, T. Mgr.; at Lackawanna, N. Y. W. A. Luce, Mgr.; at Pittsburgh, Pa. J. A. Cameron, Supt.; at Ellsworth, Pa. Owns 11,572 acres of unmined coal and 490 beehive coke ovens in Washington County, Pa. Annual cap., 2,000,000 tons of coal, 318,000 net tons of coke.
- Seneca Transportation Co. (The), Lackawanna, N. Y., inc. Mar. 14, 1906. Capital stock (all owned by Lackawanna Steel Co.) \$5,000.
- Geo. W. Smith, P. & G. M.; Fred F. Graham, Sc.; J. P. Higginson, T.; J. E. Donnelly, A. T.; Herbert Melvin, A. Sc.; W. H. Dupka, C.
- South Buffalo Ry. Co., Lackawanna, N. Y., inc. April 24, 1899. Capital stock (all owned by Lackawanna Steel Co.) \$500,000. Elmer M. Tewkesbury, Gen'l Supt. Operates 20 miles of track, 31 locomotives, 7 passenger cars and 30 freight and other cars.
- Franklin Iron Co. (The), Franklin Furnace, N. J., inc. May 14, 1871. Capital stock (all owned by Lackawanna Steel Co.) \$300,000. Moses Taylor, V. P.; A. J. Singer, A. P.; at 2 Rector St., New York, N. Y. Fred F. Graham, Sc.; J. P. Higginson, T.; W. H. Dupka, C.; at Lackawanna, N. Y. W. H. Tonking, Supt.; at 30 Ellicott St., Dover, N. J. Owns 3,851.5 acres of mountain lands and 4,262.3 acres of mineral rights, surface not owned, near Franklin Furnace, N. J.

LACLEDE STEEL CO., Arcade Bldg., St. Louis, Mo.

- Inc. June, 1911 in Missouri. Capital stock: com. \$2,200,000. Thomas R. Akin, P. & T.; W. L. Allen, V. P.; Joseph W. Lewis, V. P.; Harry F. Kay, Sc.; D. F. Eschenbrenner, G. S. M.
- Sales offices:
- Chicago, Frank H. Johnson, 208 South La Salle St.
 - Kansas City, Mo., E. W. Price, Scarritt Bldg.
 - New York, Ray M. Brower, 50 Church St.
 - St. Louis, Mo., D. F. Eschenbrenner, Arcade Bldg.
- Madison Works, Madison, Ill.: blt. 1911-12; f. o. April, 1912; 1 cont. heat. fur.; 2 gas prod.; 16" 2-h. 1-st. rail slitting; 16" 2-h. 1-st. roughing; 12" 3-h. 5-st. and 12" 2-h. 1-st. finishing; 10" 3-h. 3-st. and 10" 2-h. 1-st. finishing. Fuel, prod. gas. Product: steel rounds, squares, flats, angles, shapes and concrete bars; annual cap., 40,000 tons.

Alton Works, Alton, Ill.: blt. 1913; first steel made Oct. 28, 1913; first products rolled Aug. 14, 1913; 3 B. O. H. fur. (two 40-ton, one 50-ton); 1 Swindell 2-d. heat. fur.; 1 Morgan cont. heat. fur.; 9 gas prod.; three 4-hole soaking pits; 32" 2-h. 1-st. blooming; 18" 3-h. 2-st. billet; 12" 2-h. 5-st. Morgan cont.; 10" 3-h. 5-st. and 8" 3-h. 5-st. strip mills; 1 Mesta pickling mach. Fuel, prod. gas. Product: steel ingots, blooms and billets, bars, hoops, bands, strip steel and small shapes; annual cap., 100,000 tons ingots, 90,000 tons blooms and billets; 80,000 tons finished rolled products.

Valley Works, East St. Louis, Ill. (leased; owned by St. Louis Steam Forge & Iron Works). Forge shop; two 4-d. heat. fur.; 4 steam ham. (8,000-lb. to 10,000-lb.). Fuel, coal. Product: railway car and locomotive axles and rods, miscellaneous railway and industrial forgings; annual cap., 30,000 tons.

LA FOLLETTE COAL & IRON CO., La Follette, Tenn.

Inc. Dec. 10, 1915 in Massachusetts. Capital stock: com. auth. \$1,000,000, issued \$991,800; bonds \$280,000.

L. C. Crewe, P. & G. M.; S. S. Pratt, T. & P. A.; at La Follette. Stuart W. Webb, V. P.; at 30 State St., Boston. C. A. Stone, Sec.; at 53 State St., Boston.

Selling agents: Crocker Brothers, 21 East 40th St., New York and Cincinnati, Ohio.

Brand: "La Follette."

La Follette Furnace, La Follette: 1 stack, 72' 6" x 19'; blt. 1901-02; f. o. Sept. 24, 1902; rebt. 1906; 4 Kennedy stoves (90' x 18'); 3 steam blowing eng. (28,000 cfm.); 8 water-tube boilers, 3,000 H. P. Coke: local red and brown hematite ore. Company owns coal mines at La Follette, Tenn., leases brown ore mines at Etowah, Tenn., and owns extensive brown ore mines at Sugar Valley, Gordon Co., Ga.; it also owns 295 beehive coke ovens at furnace, annual cap., 100,000 net tons coke. Also owns limestone quarries at La Follette; annual cap., 60,000 tons limestone.

Product: foundry pig iron; annual cap., 60,000 tons.

La Fonderie D'Acier des Trois Rivieres, Ltd., Three Rivers, P. Q., Canada.

Works at Three Rivers, Quebec: 2 A. O. H. fur. (25-ton); plan to add one 5-ton electric fur. Plant idle.

Product: steel ingots and steel castings; annual cap., 20,000 tons ingots and 4,000 tons castings.

LAKE ERIE BOLT & NUT CO. (The), 915 East 63rd St., Cleveland, Ohio.

Inc. June 19, 1919 in Delaware. Capital stock: com. auth. 250,000 shares (no par), issued 150,000 shares; pref. 7% cum auth. \$2,500,000, issued \$1,500,000.

N. J. Clarke, P. & G. M.; H. E. Volmar, Sc. & T.; C. W. Colvin, A.; J. V. Culliney, G. S.; A. B. Bower, G. S. M.; E. L. Schmitt, P. A.; at Cleveland. Richard Inglis, V. P.; at Otis & Co., Cleveland.

Sales offices:

Cleveland office.

Philadelphia, S. W. Baldwin, 328 Witherspoon Bldg.

Works at Cleveland (leased; owned by Lake Erie Iron Co.): rolling mill added to bolt and nut factory 1899-1900; first products rolled Sept. 28, 1900; 8 single puddling fur.; 1 squeezer; four 4-d. heat. fur.; 12" 3-h. 5-st. and 10" 3-h. 5-st. Belgian mills; 1 pickling mach. Fuel, coal. (Formerly operated by Lake Erie Iron Co.; leased by The Lake Erie Bolt & Nut Co., July 1, 1919).

Product: scrap bar, bolt and nut rods, bolts and nuts; annual cap., 36,000 tons scrap bar, 50,000 tons bolt and nut rods; bolts and nuts, 450,000 kegs (200-lb.).

Lake Erie Iron Co., Cleveland, Ohio, see 1916 Directory, p. 193.

Leased rolling mill and bolt and nut factory at Cleveland to The Lake Erie Bolt and Nut Co., July 1, 1919.

LALANCE AND GROSJEAN MFG. CO., 299 Broadway, New York, N. Y.

Works at Harrisburg, Pa. Product: black sheets, black plate for tinning, tinplates, for own use only.

LAMB MACHINE CO., Hoquiam, Washington.

Inc. Mar. 4, 1912 in Washington. Capital stock: com. \$50,000.

Frank H. Lamb, P. & G. M.; M. B. Brown, Sc.; Alice E. Lamb, T.; E. W. Brear, G. S.; Victor Hanson, G. S. M.

Works at Hoquiam: 1 Greene electric fur. (1½-ton); f. o. May, 1919; 1 cupola. Forge shop and machine shop for own use.

Product: steel castings for sale and own use for logging and lumbering machinery; chrome, vanadium and maganese alloy steel castings; gray iron and brass and bronze castings; annual cap., 2,500 tons electric steel castings, 500 tons gray iron, 50 tons brass and bronze castings.

LATROBE ELECTRIC STEEL CO., Latrobe, Pa.

Inc. Mar. 10, 1913 in Pennsylvania. Capital stock: com. \$300,000.

M. W. Saxman, P.; E. T. Edwards, 2 V. P. & G. M.; I. B. Shallenberger, Sc. & T.; A. B. Baker, A.; Frank Garratt, G. S.; E. J. Yealy, P. A.; at Latrobe. C. W. Guttzeit, 1 V. P.; at 165 Broadway, New York.

Sales offices:

General office, 165 Broadway, New York, C. W. Guttzeit, M., with branches at:

Boston.

Chicago, 572 West Randolph St.

Cincinnati, 2802 Union Central Bldg.

Cleveland, Union National Bank Bldg.

Detroit, 253 E. Jefferson St.

Erie, Pa., 15th & Ash Sts.

Philadelphia, Finance Bldg.

Pittsburgh, First Nat. Bank Bldg.

Toledo, 248 Water St.

Western office under management of Rolph, Mills & Co., with branches in Los Angeles, Portland, Ore., San Francisco, and Seattle.

Works at Latrobe, Pa.: blt. 1913; first steel made Dec. 1, 1913; 3 Heroult electric fur. (two 6-ton, one 3-ton); 14 heat. fur. (nine 2-d., five 3-d.); 16" 3-h. 3-st.; 12" 3-h. 5-st.; 9" 3-h. 6-st. bar mills; 9 box annealing fur.; 6 steam ham. (750-lb. to 4-ton). Fuel, coal and oil.

Product: steel ingots, and forged and rolled tool steel; special alloy tool steel; annual cap., 13,200 tons ingots, 10,000 tons rolled products, 3,000 tons forged products.

LAVINO FURNACE CO., 551 Bullitt Bldg., Philadelphia, Pa.

Inc. Jan. 22, 1918 in Delaware. Capital stock: com. \$1,500,000.

E. J. Lavino, P.; E. G. Lavino, 1 V. P.; E. M. Lavino, Sc.; H. F.

Lavino, T.; John J. Howard, G. M.

Sales agents: E. J. Lavino & Co., Bullitt Bldg., Philadelphia.

Lebanon Furnace, Lebanon, Pa.: 1 stack, 63' 1½" x 14'; blt. 1867; rebt. 1904; relined 1918; 4 stoves (two 4-pass 60' x 18', two 2-pass 78' 6" x 20'); 3 steam blowing eng. (25,245 cfm.); 4 water-tube boilers, 800 H. P.; 4 cylindrical boilers, 400 H. P.; 1 slag granulating pit. Conn. and by-product coke: manganese and Lake ore. (Formerly owned by Lebanon Blast Furnace Co.; acquired by Lavino Furnace Co., Jan., 1918). Product: foundry pig iron, ferro-manganese, spiegeleisen; annual cap., 36,000 tons pig iron.

Marietta Furnace, Marietta, Lancaster Co., Pa.: 1 stack, 74' 7½" x 16"; rebt. 1917; four 2-pass stoves (60' x 18'); 2 steam blowing eng. (18,472 cfm.); 5 water-tube boilers 1,164 H. P. Conn. and by-product coke: Lake and manganese ore. (Formerly Vesta Furnace owned by the Susquehanna Iron Co.; acquired by E. J. Lavino & Co., Jan., 1917, and taken over by Lavino Furnace Co., Jan., 1918). Product: foundry pig iron, ferro-manganese and spiegeleisen; annual cap., 50,000 tons.

Oriskany Furnace, Reusens, Campbell Co., Va.: 1 stack, 80' 6" x 16' 6"; blt. 1912-13; rebt. 1918; four 2-pass stoves (70' x 18'); 3 (1 spare) steam blowing eng. (24,620 cfm.); 5 water-tube boilers, 1,482 H. P.; also serve pumps, sintering plant and machine shop, 1 Dwight & Lloyd sintering plant for pyrites cinder and flue dust; annual cap., 7,800 tons. West Va. and Conn. coke: local brown and magnetite ores and manganese ore. Company owns iron ore mines at Pittsville, Va.; annual cap., 40,000 tons. (Formerly

owned by the Oriskany Ore & Iron Corporation; acquired by the Lavino Furnace Co., Feb., 1918). Product: foundry pig iron, ferro-manganese and spiegeleisen; annual cap., 60,000 tons.

Sheridan Furnace, Sheridan, Pa.: 1 stack, 78' 6" x 16' 6"; blt. 1874-75; rebt. 1891 and 1918; 4 stoves (two 64' x 20', two 80' x 20'); 2 steam blowing eng. (19,000 cfm.); 5 water-tube boilers, 1,900 H. P. Conn. and by-product coke: manganese ore, Lake and Cornwall ores. (Formerly owned by Berkshire Iron Works; acquired by the Lavino Furnace Co., Jan., 1918). Product: foundry pig iron; ferro-manganese and spiegeleisen; annual cap., 54,000 tons.

Total annual capacity of the 4 blast furnace: 200,000 tons pig iron, or 130,000 tons spiegeleisen, or 90,000 tons ferro-manganese.

LEASIDE ENGINEERING CO., Ltd., Leaside, Ontario, Canada.

Inc. 1916 in Dominion of Canada. Capital stock: com. \$250,000. F. John Bell, P.; E. A. Wallberg, V. P.; at Toronto. H. J. Boggis, Sc. & T.; H. Horsfall, Works M.; T. A. Gass, G. S. M.; at Leaside. Works at Leaside, Ontario and Beaupre, Quebec.

Works at Beaupre, P. Q., Canada: 3 three-phase electric fur.; f. o. 1918. Electric power from Laurentian Power Co., Beaupre.

Product: 50% to 85% ferro-silicon; annual cap., 9,000 tons 50% ferro-silicon.

Lebanon Blast Furnace Co., see 1916 Directory, p. 194; acquired by Lavino Furnace Co., Jan., 1918.

LEBANON STEEL FOUNDRY, Lebanon, Pa.

Inc. Dec. 11, 1911 in Pennsylvania. Capital stock: com. \$20,000. W. H. WorriLOW, P.; T. S. Quinn, T. & G. M.; H. H. Light, Sc.; R. A. Nichols, Jr., C.; at Lebanon. A. J. McDonald, G. S. M.; at Bellevue Court Bldg., Philadelphia.

Sales office: Philadelphia, A. J. McDonald, 703 Bellevue Court Bldg. Works at Lebanon: blt. 1911; first steel made Feb. 1, 1912; 2 Heroult electric fur. (2-ton).

Product: steel castings for sale for automobiles and machine tools; annual cap., 4,800 tons.

LEBANON VALLEY IRON & STEEL CO., Lebanon, Pa.

Inc. Jan. 28, 1910 in Pennsylvania. Capital stock: com. \$1,000,000; pref. 7% cum. \$1,000,000.

W. C. Sproul, P.; Howard Longstreth, Sc. & T.; C. M. Neiler, C.; John C. Brown, G. M.

Sales offices:

Atlanta, Ga., Fourth National Bank Bldg.

Baltimore, 1319 Continental Trust Bldg.

Chicago, Railway Exchange Bldg.

Fort Worth, Texas, 306 Texas State Bank Bldg.

New York, 52 Broadway.

Philadelphia, Real Estate Trust Bldg.

Brand: "Duncannon."

Product: bar iron, machine and carriage bolts, square and hexagonal nuts and forged spikes.

Duncannon Iron Works, Duncannon, Pa.: blt. 1836; reblt. after fire Feb., 1914; 22 single-puddling fur.; four 3-d. heat. fur.; 20" 3-h. 2-st. puddle; 12" 3-h. 5-st. finishing; 9" mill with 12" 3-h. 1-st. roughing and 9" 3-h. 4-st. finishing. Fuel, bit. coal. Foundry and machine shop for own use. Product: bar iron; annual cap., 35,000 tons.

Lebanon Valley Works, Lebanon, Pa.: blt. 1902-03, f. o. Jan. 12, 1903; 10 double puddling fur.; 8 Ely rotary scrap fur.; 2 squeezers; 9 coal-fired heat. fur. (3-d.); 22" 3-h. 2-st. puddle; 20" 3-h. 2-st. puddle; 16" 3-h. 4-st. finishing; 14" 3-h. 1-st. roughing and 10" 3-h. 4-st. finishing; 12" 3-h. 1-st. roughing and 9" 3-h. 4-st. finishing; 12" 3-h. 1-st. roughing and 8" 3-h. 4-st. finishing; bolt, spike and nut department. Fuel, coal. Product: muck bar and scrap bar; bar iron, angles and special shapes; bolts, nuts and spikes; annual cap., muck and scrap bar, 98,000 tons; finished bars and shapes, 100,000 tons; bolts and nuts, 15,000 tons; spikes, 60,000 kegs (200-lb.).

Leesport Furnace Co., Philadelphia, Pa., see 1916 Directory, p. 195; see P. W. Kiefaber.

LE MOYNE STEEL CO., 904 Park Bldg., Pittsburgh, Pa.

H. A. Kuhn, P.; W. H. Norris, G. M.

Sales agents:

Buffalo, 325 Ellicott Sq.

Chicago, 27 South Clinton St.

Cincinnati, C. M. Bigger & Co. 414 Elm St.

Cleveland, 345 Leader News Bldg.

Detroit, 66 West Larned St.

New York, 30 Church St.

Pittsburgh, 904 Park Bldg.

Warehouses at Monongahela City, Detroit, New York and Cincinnati.

Works at Monongahela, Pa.: blt. 1918; f. o. July 12, 1918; one 2-ton Heroult electric fur.; 10" 3-h. 5-st. guide mill; 6 ham. (650-lb. to 8,000-lb.), with 6 heat. fur.; 2 annealing fur.; heat treating plant. Fuel, coal.

Product: alloy steel ingots; high speed tool steel; annual cap., 1,350 tons ingots, 1,000 tons rolled products, 3,800 tons forged products.

LENOIR CAR WORKS, 510 Candler Bldg., Atlanta, Ga.

Inc. June 1, 1904, in Tennessee. Capital stock: \$350,000.

Fairfax Harrison, P.; L. E. Jeffries, V. P.; at Washington, D. C.

H. W. Miller, V. P.; H. F. Pierce, Sc. & A. T.; W. R. Colklesser,

S. M. & P. A.; at Atlanta. F. X. Donafrey, A.; Z. B. Wilson, M.; at Lenoir City.

Works at Lenoir City, Tenn.: one McLain 5-ton A. O. H. fur.
Product: steel castings; annual cap., 3,000 tons.

Lessig (George B.) Co., Pottstown, Pa., see 1916 Directory, p. 196;
acquired by Reading Iron Co., August 16, 1919.

Liberty Steel Co., Warren, Ohio, was acquired by Trumbull Steel Co.,
July 1, 1919; see Trumbull Steel Co.

LIMA STEEL CASTING CO. (The), Lima, Ohio.

Inc. July 8, 1912 in Ohio. Capital stock: com. auth. \$100,000,
issued \$80,000.

B. F. Thomas, P.; W. C. Bradley, V. P.; M. L. Johnson, Sc., T.
& G. M.; F. Z. Dempster, G. S.; L. V. Calhoun, G. S. A.; J. R.
Carnes, P. A.

Works at Lima: blt. 1912; f. o. Aug., 1912; 1 Whiting converter
(1½-ton), f. o. Feb. 23, 1916; one 5-ton A. O. H. fur. Crucible
furnaces abandoned in 1916.

Product: steel castings for general purposes; annual cap., 4,000 tons
converter and 4,800 tons open hearth castings.

LINK-BELT COMPANY, 910 South Michigan Ave., Chicago, Ill.

Inc. Nov. 15, 1880 in Illinois. Capital stock: com. auth. \$3,300,-
000, issued \$3,224,000; pref. 6% cum. \$750,000.

Charles Piez, P. & T.; B. A. Gayman, Sc.; P. G. Reid, A. T.;
at 910 S. Michigan Ave., Chicago. Staunton B. Peck, V. P.; at
Philadelphia, Pa. A. Kauffmann, V. P.; at Indianapolis, Ind.
A. C. Johnston, V. P.; F. A. Marsh, G. P. A.; at 329 W. 39th
St., Chicago, Ill.

Sales offices in all principal cities.

Company operates plants as follows:

Chicago Plant, 329 West 39th St. (Steel-casting plant, gray iron
foundry, machine shops and structural steel shops).

Philadelphia Plant, Nicetown, Philadelphia. (Machine shops
and structural steel shops).

Dodge Plant, 501 North Holmes Ave., Indianapolis, Ind. (Steel
chains).

Belmont Foundry and Ewart Works, South Belmont Ave.,
Indianapolis, Ind. (Machine shop, chain assembly shop and malle-
able iron foundry, annual cap., 17,000 tons malleable iron castings.)
Company controls Canadian Link-Belt Co., Ltd., Toronto, with
chain works and assembling plant at Toronto and warehouse at
Montreal.

Works at 329 W. 39th St., Chicago: blt. 1883; one 2,500-lb. Zenzes
steel converter served with 2 cupolas, added in 1907; first steel
made July 20, 1907. Fuel; coke, coal and oil.

Product: steel castings for own use; annual cap., 1,200 tons steel and
7,200 tons gray iron castings. Manufacture iron and steel chain and
wheels and conveying, elevating and power transmission appliances;
locomotive cranes, electric hoists, wagon loaders, coal washers, etc.

LLEWELLYN IRON WORKS, 1100 North Main St., Los Angeles, Cal.

Inc. 1894 in California. Capital stock: auth. \$1,500,000.

Reese Llewellyn, P.; Waller Taylor, 1 V. P. & A.; William Llewellyn, 2 V. P.; D. E. Llewellyn, Sec. & T.; at Los Angeles. Benjamin Harwood, G. M. Steel Plant; L. R. Check, G. S. Steel Plant; Harold Child, P. A.; at Torrance, Cal.

Sales office, 1100 N. Main St., Los Angeles.

Company operates two plants: one at Los Angeles consisting of machine shop, forge shop, tank and plate shop, structural steel dept. and elevator manufacturing dept.; and one at Torrance, Cal., as described below.

Torrance Plant: blt. 1916, first steel made Oct. 1, 1916; 2 B. O. H. fur. (35-ton); 1 Heroult electric fur. (3-ton); 2 cupolas; 4 cont. heat. fur.; 22" 3-h. 4-st. billet; 14" 3-h. 1-st. breakdown and 12" 3-h. 5-st. bar; 8" 3-h. 5-st. bar. Fuel, nat. gas.

Product: steel ingots and steel castings, forging ingots; blooms and billets, merchant bars, rounds, squares and flats, concrete bars, light structural shapes, chain, bolt, nut and rivet rods; annual cap., 35,000 tons B. O. H. ingots, 2,500 tons steel castings (1,000 tons B. O. H., 1,500 tons electric), 36,000 tons blooms and billets, 30,000 tons finished hot rolled products, including 1,000 tons light structural shapes, 10,000 tons concrete bars, 3,000 tons chain, bolt, nut and rivet rods, 16,000 tons merchant bars; 2,000 tons gray iron castings.

LOBDELL CAR WHEEL CO., Wilmington, Del.

Inc. April, 1867 in Delaware. Capital stock: com. \$500,000.

George G. Lobdell, Jr., P.; C. F. Wollaston, V. P. & T.; Joseph Stuart, Sec. & G. S.

Sales offices:

Bluefield, W. Va., F. M. Archer.

New York, E. H. Mays, 50 Church St.

Norton, Va., W. H. Keller.

Wilmington, Del., Main office.

Works at Wilmington, Del.: blt. 1882; first steel made Aug. 7, 1910; 2 A. O. H. fur. (10-ton, 3½-ton); 4 cupolas in chilled and gray iron foundry.

Product: high carbon cast steel car wheels, for electric, locomotive, street and interurban cars, industrial cars and general castings; also chilled cast-iron car wheels and rolls and miscellaneous chilled and gray iron castings; annual cap., steel castings, 6,000 tons; chilled and gray iron castings, 45,000 tons.

LOCKHART IRON AND STEEL CO., Pittsburgh, Pa.

Inc. March 18, 1890 in Pennsylvania. Capital stock: com. \$1,000,000.

J. M. Lockhart, Ch.; T. J. Gillespie, P.; J. H. Lockhart, V. P.;

J. M. Gillespie, V. P.; T. J. Gillespie, Jr., Sc. & T.; Samuel Poster, G. S.

Brands: "Vulcan," "Vulcan XX" and "Vulcan Special."

Vulcan Forge & Iron Works, McKees Rocks, Pa.: forge blt. 1877; rolling mill blt. 1882; 38 single puddling and busheling fur.; 1 squeezer; 8 heat. fur. (one 2-d., two 3-d., five 4-d.); 23" 3-h. 2-st. muck; 16" 3-h. 2-st. bar; 16" 2-h. 1-st. universal; 16" 3-h. 2-st. bar; 12" 3-h. 5-st. bar; 9" 3-h. 5-st. guide mills; 1 steam ham. (5-ton). Fuel, coal and nat. gas.

Product: rolled bar iron, bands, bridge iron, soft steel bars and hexagon, grooved and angle iron and steel; annual cap., 45,000 tons muck and scrap bar, 70,000 tons finished rolled products.

LOGAN IRON & STEEL CO., 1218 Stephen Girard Bldg., Philadelphia, Pa.

Inc. Jan. 16, 1871 in Pennsylvania. Capital stock: com. \$240,000; pref. 8% cum. auth. \$160,000.

Frank G. Kennedy, Jr., P.; H. O. Enigk, Sc. & T.; at Philadelphia. David Thomas, G. M.; at Burnham, Pa.

Southern sales agent: Lynchburg, Va., W. P. Clark, P. O. Box 252. Brand: "Logan."

Logan Iron and Steel Works, Burnham (4 miles from Lewistown, Pa., on the Penna. R. R.): blt. 1869; rebt. after fire 1894; 11 double puddling fur.; 1 squeezer; 6 heat. fur. (4-d.); 18" 3-h. 1-st. puddle; 18" bar with 2-st. 3-h. and 1-st. 2-h.; 12" 3-h. 5-st. guide; 10" to 8" 3-h. 6-st. Belgian comb.; 1 steam ham; 300,000-lb. machine for testing all kinds of iron, etc. Fuel, bit. coal. Chemical laboratory.

Product: charcoal and refined bar iron, staybolt iron, engine bolt iron, chain iron, fender and boat iron, flats, rounds, ovals, squares, half rounds, band iron, bevel edge iron, angles, wagon and buggy tire in round or square edge, truck sides, drill rods to 4½" dia. and special small shapes of all sorts; annual cap., 45,000 tons rolled iron.

LONDON ROLLING MILL CO., Ltd., London, Ontario, Canada.

Inc. 1902 in Province of Ontario. Capital stock: com. auth. \$500,000, issued \$270,000.

John White, P.; Sir Adam Beck, V. P.; Charles H. White, G. M.; J. Frank White, G. S.

Selling agents: Vancouver, McPherson & Teetzel; Winnipeg, Bissett & Webb, Ltd.

Works at London, Ontario: blt. 1902-03; f. o. Mar., 1903; 4 single puddling fur.; 1 squeezer; three 4-d. heat. fur.; 18" 3-h. 4-st. comb. muck and bar mill. Fuel, pulv. coal.

Product: merchant bar iron and steel; annual cap., 25,000 tons.

Londonderry Iron & Mining Co., Ltd. (The), Montreal, P. Q., Canada. (In liquidation.)

A. J. McMillan and The Eastern Trust Co., Receivers, Halifax.

Works at Londonderry, Nova Scotia :

Londonderry Furnace : 1 stack, 60' x 25' (shell) ; blt. 1875-6 ; f. o. 1877 ; last reblt. 1907 ; 3 Siemens-Cowper fire-brick stoves, 54' x 21'. Coke ; local ore. Company owns 97 coke ovens at the furnace with annual cap. of 40,000 net tons ; coal washing plant, annual cap., 60,000 net tons ; also iron ore mines in Colchester Co., Nova Scotia. Product : foundry pig iron ; annual cap., 35,000 tons. *Last active in 1908.*

Steel Foundry : one 5-ton B. O. H. fur., blt. 1909 ; f. o. Dec. 28, 1909. Fuel, oil. Product : steel castings for sale ; annual cap., 2,500 tons. *Idle.*

LORAIN STEEL CO. (The), 545 Central Ave., Johnstown, Pa.

Inc. April 13, 1893 in Pennsylvania. Subsidiary of the United States Steel Corporation.

P. M. Boyd, Sc. & T. ; Carroll Burton, G. S. ; H. M. Davies, A. ; C. F. Brandler, P. A.

Sales agents :

Atlanta, W. W. Kingston, Equitable Bldg.

Chicago, A. S. Littlefield, Monadnock Bldg.

Cleveland, Otto Fischer, Rockefeller Bldg.

New York, A. L. Verner, Hudson Terminal Bldg.

Pittsburgh, H. L. Gleeson, Frick Bldg.

San Francisco, United States Steel Products Co., Rialto Bldg.

Johnstown Works, Johnstown : blt. 1887-88 ; f. o. May 13, 1888 ; three 15-ton A. O. H. fur. ; iron foundry with one cupola. Frog and switch shops, etc.

Product and annual cap. : steel castings for own use and for sale, 15,500 tons ; manganese steel castings ; semi-steel castings, 4,800 tons ; switches, mates, curve crosses, frogs, split switches, girder crossings, drop forgings, curves, track and machine bolts, and all kinds of special work for steam railroads and street railways, 40,000 tons.

Loucks Iron & Steel Co., Scottdale, Pa., see 1916 Directory, p. 200, was leased to the Roanoke Steel Co., June 1, 1916 ; operation discontinued Oct. 31, 1918 ; plant sold in 1919 to Barr & Co., Inc., Pittsburgh, Pa., now being dismantled.

Louisville Steel & Iron Co., Louisville, Ky., see 1916 Directory, p. 200. Now in hands of Louisville Trust Co., as trustee for the bondholders, see Louisville Trust Co.

Louisville Trust Co. (Trustee for bondholders), Louisville, Ky.

Works at Louisville, Ky. : blt. 1900-01 ; reblt. 1902 after fire ; 6 single puddling fur. ; 2 scrap fur. ; squeezer ; 2 heat. fur. ; 20" 3-h. 2-st. muck, 12" 3-h. 1-st. roughing and 8" 3-h. 5-st. finishing. (Formerly owned by Louisville Steel & Iron Co. ; reorganized as Louisville Steel & Iron Products Co., in Feb., 1916 ; acquired by the Louis-

ville Steel & Iron Co., Inc. in Dec., 1916; receiver appointed Apr. 25, 1919). Product: muck bar, merchant bar; annual cap., 6,000 tons muck bar, 12,000 tons merchant bar iron and steel.

LOW MOOR IRON CO. OF VIRGINIA (The), Low Moor, Va.

Inc. 1873 in Virginia. Capital stock: com. auth. \$1,500,000, issued \$1,050,000; pref. 7% cum. auth. \$500,000, issued \$417,000; bonds \$500,000.

Frank Lyman, P.; Harold T. White, V. P.; Guy Du Val, Sc.; H. A. Dalton, T.; at 14 Wall St., New York. F. U. Humbert, G. M.; G. W. Lipscomb, P. A.; at Low Moor.

Selling agent: Phillips Isham, 55 Liberty St., New York; Walter Wallingford & Co., Traction Bldg., Cincinnati.

Furnaces at Low Moor: Furnace A, 80' x 19'; blt. 1880; rebt. 1910; relined 1917; Furnace B, 85' x 19'; blt. 1887; rebt. 1902-03; relined 1920; 9 stoves (3 Whitwell, 3 Foote, 3 Pollock); 3 steam blowing eng. (36,000 cfm.); 6 water-tube boilers, 1,500 H. P.; Dwight & Lloyd sintering plant, annual cap., 54,000 tons. Beehive coke: local brown hematite and Lake ore. Product: foundry pig iron; annual cap., 60,000 tons.

Covington Furnace, Covington, Va.: Furnace C, 75' x 18'; blt. 1891-3; rebt. 1919; 3 Gordon-Whitwell-Cowper stoves; 4 steam blowing eng. (36,000 cfm.); 6 tubular boilers, 750 H. P. Beehive coke: local brown hematite ore. Product: foundry pig iron; annual cap., 60,000 tons.

The company owns 352 beehive coke ovens; 100 at Low Moor, annual cap., 50,000 net tons; 202 at Kay Moor, annual cap., 100,000 net tons; 50 at Covington, annual cap., 25,000 net tons; total annual cap., 175,000 net tons. Company owns or leases three iron ore properties near furnaces with an annual cap. of 88,000 tons. It also owns limestone quarries at Low Moor and Panther Gap, Va., annual cap., 80,000 tons. Company owns and controls 6,500 acres of coal land in the New River Field and operates two coal mines on this property.

LUDLUM STEEL CO., Watervliet, N. Y.

Org. 1854; inc. 1898 in New Jersey. Capital stock: com. \$1,000,000. Edwin Corning, P. & G. M.; Parker Corning, V. P. & T.; E. Palmer Gavit, Sc.; Hiland G. Batcheller, V. P.; P. A. E. Armstrong, V. P. & G. S. M.; William H. Tuck, C.; C. W. Wright, G. S.; F. S. Quick, P. A.; at Watervliet.

Sales offices:

Buffalo, 1008 Marine Trust Co. Bldg.

Chicago, 928 Peoples Gas Bldg.

Cincinnati, 816 Mercantile Bldg.

Cleveland, 637 Guardian Bldg.

Detroit, 33 Woodward Ave.

New York, 2 Rector St.

Philadelphia, 1517 Real Estate Trust Bldg.

Pittsburgh, Park Bldg.

Sales agents for New England: Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

Works at Watervliet, N. Y.: new plant blt. 1906-07; first crucible steel ingots made Sept., 1907; first rolled products, Oct, 1907; crucible fur. abandoned 1917; 3 Ludlum electric fur. (10-ton); 14 heat. fur.; 8 annealing fur., oil-fired; 18" 3-h. 4-st. roughing and finishing; 14" 3-h. 3-st.; 10" 3-h. 7-st.; 9" 3-h. 6-st. finishing bar mills; 4 hand pickling tanks; 16 wire drawing blocks, 2 wire drawing benches; 6 steam ham. (1,000-lb. to 12,000-lb.); 4 straighteners for rounds; 1 straightener for flats; 2 automatic straighteners for coils. Fuel, coal and oil.

Product: special alloy and tool steel ingots, rolled and hammered high speed and carbon tool steel; annual cap., 16,000 tons.

LUKENS STEEL CO. (The), Coatesville, Pa.

Inc. Jan. 17, 1917 in Pennsylvania. Capital stock: com. auth. \$22,500,000; issued \$15,898,800. (Formerly Lukens Iron and Steel Co., reincorporated as the Lukens Steel Co., Jan., 1917).

A. F. Huston, P.; C. L. Huston, 1 V. P. & G. M.; H. B. Spackman, 2 V. P. & P. A.; Joseph Humpton, Sec. & T.; C. F. Humpton, A. Sec. & A. T.; W. H. Hamilton, G. S.; F. H. Gordon, G. S. M.

Sales offices:

Baltimore, W. H. Crampton, Continental Trust Bldg.

Boston, H. G. Porch, Board of Trade Bldg.

Chicago, A. M. Castle & Co., 715 No. Morgan St.

Cleveland, J. F. Corlett & Co., 1320 Rockefeller Bldg.

Los Angeles, A. M. Castle & Co.

New Orleans, J. W. Porch, 620 So. Peters St.

Philadelphia, G. T. Shants, Commercial Trust Bldg.

New York, Wm. H. Edgerley, Whitehall Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Product: steel ingots, slabs, billets, forging blanks; steel boiler, ship and tank plates, universal plates, etc.

The company owns the capital stock of the Alleghany Ore and Iron Co., which operates 2 blast furnaces and iron ore mines in Virginia.

Works at Coatesville, Pa.: 21 B. O. H. fur. (five 35-ton, ten 50-ton, six 90-ton); one 35-ton A. O. H. fur.; two 90-ton B. O. H. fur. building; 15 soaking pits (nine 3-hole, six 4-hole); 14 heat. fur. (four 1-d. coal for 84" mill, three 3-d. gas for 112" mill; four 4-d. gas for universal; three cont. for 140" mill); one 2-h. universal slabbing mill with horizontal rolls 34" x 52", vertical rolls 20" x 68 $\frac{3}{4}$ " ; 84" 3-h. sheared plate mill, 30" x 84", middle roll 16 $\frac{1}{8}$ " x 84"; 112" 3-h. sheared plate mill, 36" x 112" and 20" x 112"; 140" 3-h. sheared plate mill, 38" x 140" and 22" x 140"; 204" 4-h. sheared

plate mill, 50" x 204" and 34" x 204"; 48" 3-h. universal plate mill, 28" x 66" and 21" x 66", vertical rolls 17 $\frac{1}{4}$ " x 25 $\frac{1}{2}$ " and 15 $\frac{3}{4}$ " x 24 $\frac{1}{2}$ ". Flanging dept. with flanging machines and hydraulic presses for special work. Also equipped with punches, drills, facing machines, etc., for making and finishing flue holes, manholes, saddle plates, manhole and hand hole covers, etc. Boiler brace dept. for all sizes of weldless hydraulic pressed boiler braces (Huston patent). Repair shops for mechanical and electrical work. Steel and brass foundry for own use. Fuel, bituminous coal and producer gas. Product and annual cap.: 612,000 tons ingots (585,000 tons basic, 27,000 tons acid); 300,000 tons slabs; 530,000 net tons finished plates (440,000 net tons sheared; 90,000 net tons universal).

LUNDIN STEEL CASTING CO. (The), 41 Norwood St., Neponset, Boston, Mass.

Inc. 1905 in Massachusetts. Capital stock: com. auth. \$25,000, issued \$22,550.

F. V. Streeter, P., Sc., T. & G. M.; F. E. Smith, G. S.

Works at Neponset: blt. 1909; 1 A. O. H. fur. (3-ton); 2 crucible fur. (8-pot). Fuel, oil.

Product: crucible and O. H. castings for sale for machinery, tools and automobiles; annual cap., 1,000 tons (800 tons O. H., 200 tons crucible).

LUNKENHEIMER CO. (The), P. O. Box 876, Cincinnati, Ohio.

Org. 1862; inc. 1889 in Ohio. Capital stock: com. \$1,000,000; pref. 6% cum., \$1,000,000.

E. H. Lunken, Ch.; Eshelby F. Lunken, P.; David C. Jones, 1 V. P. & G. M.; H. F. Schaefer, 2 V. P.; Alfred J. Jupp, 3 V. P.; L. J. Bradford, T.; George Seyler, G. S.; E. H. Korte, P. A.; at Cincinnati.

Sales offices:

Boston, W. W. Beal, 136-138 High St.

Chicago, C. Frank Bowes, 186 North Dearborn St.

London, Eng., John Deweert, 35 Great Dover St., S. E.

New Orleans, Tulane-Newcomb Bldg.

New York, H. S. Whitney, 129-135 Lafayette St.

Pittsburgh, Park Bldg.

San Francisco, Rialto Bldg.

Works at Cincinnati: blt. 1901 to manufacture valves and steam fittings; special steel fur. installed 1905; f. o. Dec., 1905; 1 Heroult electric fur. (1-ton); six $\frac{1}{2}$ -ton special fur. and 2 crucible fur. dismantled in 1916.

Product: valves and other steam fittings. Annual cap, 6,000 tons steel castings for own use.

Lynch, Austin, Canton, Ohio, see 1916 Directory, p. 204. Works at Greencastle, Ind., sold to the American Zinc Products Co., Oct. 1, 1917. Plant converted to roll zinc sheets.

McCONWAY & TORLEY CO. (The), 48th St. & A. V. Ry., Pittsburgh, Pa.

Capital stock: com. \$1,000,000; pref. auth. \$250,000, none issued.
 William McConway, P.; William McConway, Jr., V. P.; Stephen C. Mason, Sc.; G. W. McCandless, T.

Selling agents:

Chicago, H. C. Bouhoup, 204 Great Northern Bldg.

San Francisco, McMullin & Eyre, Claus Spreckels Bldg.

Works at 48th St. & A. V. Ry., Pittsburgh: blt. 1901-02, f. o. Jan. 25, 1902; 6 A. O. H. fur. (two 20-ton, four 25-ton). Fuel, nat. gas and fuel oil.

Product: steel car couplers and miscellaneous car and locomotive castings; forging ingots, nickel and chrome alloy steel ingots. Annual cap., 50,000 tons forging ingots; 34,000 tons steel castings for own use and for sale.

McCORD & CO., 1905 Peoples Gas Bldg., Chicago, Ill.

Inc. July 6, 1917 in Delaware. Capital stock: com. 25,000 shares, no par value; pref. 7% cum. \$500,000.

A. C. McCord, P.; Morrill Dunn, 1 V. P. & Sc.; H. D. Taylor, 2 V. P.; J. A. Lamon, 3 V. P.; W. C. Waggoner, T.; A. V. Smith, A.; E. L. Carter, Production M.; W. E. Howard, P. A.

Selling agent: L. A. Shepard, 165 Broadway, New York.

Works at West Pullman, Ill.: two 2-ton Tropenas converters, f.o. Nov., 1914, now idle and abandoned; 2 Ludlum electric fur. (10-ton), first electric steel castings May 12, 1918; 2 cupolas.

Product: steel castings for sale and own use; manganese and nickel alloy steel castings; pressed steel work; cast and pressed steel journal boxes; gray iron castings; annual cap., 12,000 tons steel castings.

McCOY-LINN IRON CO., Milesburg, Pa.

Inc. Dec., 1902 in Pennsylvania. Capital stock: com. auth. \$25,000, issued \$12,400.

Edmund Blanchard, P.; John McCoy, Sc., T. & G. S.

Selling agent: Pittsburgh, The Thomas R. Heyward Co., Farmers Bank Bldg.

Brand: "Hecla."

Hecla Furnace, Milesburg, (leased; owned by Estate of McCoy & Linn): 1 stack, 32' x 8'6"; blt. 1864; cold blast; water power; open top. Charcoal: Nittany Valley ore.

Product: charcoal forge and foundry pig iron; annual cap., 1,800 tons. Milesburg Iron Works: charcoal bloomery forge dismantled.

McCULLOUGH IRON CO., 305 Equitable Bldg., Wilmington, Del.
Inc. 1865 in Delaware. Capital stock: com. auth. \$1,000,000, issued \$450,000.

Martin E. Walker, P.; Horace Wilson, V. P. & T.; J. S. Wilson, Sc.; E. G. Jones, G. M.; F. L. Johnson, P. A.

Minquas Iron Works, Wilmington: blt. 1873, f. o. 1875; 4 pair and 4 sheet fur.; 5 annealing fur.; 4 hot black sheet mills (26" x 34" and 26" x 44"); 3 cold mills; 2 galvanizing pots. Fuel, coal and prod. gas.

Product: black and galvanized steel sheets; annual cap., 12,000 tons.

McINNES STEEL CO., Ltd., Corry, Pa.

Inc. April 10, 1901 in Pennsylvania. Limited partnership.

J. J. McInnes, P.; H. B. Smith, Sc. & T.; J. H. McInnes, G. S.

Sales offices:

Chicago, Arthur E. Duclos. Cincinnati, Paul E. Noe.

Cleveland, G. W. Radcliffe.

Works at Corry: one 30-pot crucible fur.; one 4-d. coal-fired heat. fur., one coke-fired fur.; 2 annealing fur.; 6 ham. (500 to 2,200-lb.); 12" 2-h. 1-st. bar mill used only for special work.

Product: carbon and alloy crucible tool steels, high speed steel, crank shafts, piston rods, connecting rods, gear blanks, die blocks, and special forgings; annual cap., 1,000 tons crucible ingots.

McKEEFREY IRON CO., Main & Washington Sts., Leetonia, Ohio.

Inc. July 16, 1915 in Delaware. Capital stock: com. \$100,000; pref. 7% cum. \$100,000.

John McKeefrey, P.; W. D. McKeefrey, V. P. & G. M.; N. J. McKeefrey, Sc. & P. A.; F. F. Brooks, T.; E. M. Peters, G. S.

Brands: "McKeefrey," "Seneca," "Grafton."

McKeefrey Furnace at Leetonia: 1 stack, 76' x 18', blt. 1866, rebt. 1894, relined 1918; 4 Cowper-Kennedy stoves (three 90' x 20', one 75' x 20'); 4 steam blowing eng. (88,000 cfm.); 12 water-tube boilers, 3,380 H. P.; 1 Uehling single-strand casting mach.; slag granulating pit (annual cap., 100,000 tons). Conn. coke: Lake ore.

Product: bessemer, basic, malleable, foundry and forge pig iron; annual cap., 120,000 tons.

McKEESPORT TIN PLATE CO., McKeesport, Pa.

Inc. May 7, 1901 in Pennsylvania. Capital stock: com. auth. \$10,000,000, issued \$2,928,900; bonds, \$1,236,000.

E. R. Crawford, P.; E. P. Douglass, V. P.; G. V. Parkins, V. P.; H. H. Frey, Sc.; W. L. Curry, T.; H. M. Clark, A.; J. E. Lauck, G. M.; R. E. Willbride, P. A.

Sales office: New York, 256 Broadway, Charles Brechemin, M.

Port Vue Mills, Port Vue, Pa.: 1902-03, f. o. Mar., 1903; 44 pair and sheet fur.; 44 hot black plate mills (28" x 32", 28" x 34" and

28" x 36"); plates No. 38 to 14 gage; 42 cold mills (25" x 36" and 26" x 44" arranged tandem, 3 sets each); 4 Mesta 4-arm pickling machines; 14 annealing fur. Tinhouse: blt. 1902-03, f. o. April, 1903; 80 tinning pots. Fuel, coal in rolling mills, natural gas and powdered coal in tinhouse.

Product: black plates for tinning; annual cap., 180,000 tons; tin-plates, annual cap., 4,000,000 base boxes.

McKINNEY STEEL CO. (The), 703 Perry-Payne Bldg., Cleveland, Ohio.

Inc. May 6, 1901 in Ohio.

Price McKinney, P.; James W. Corrigan, V. P.; H. T. Harrison, V. P. & G. M. Manufacture; H. W. Haggerty, V. P. & G. S. M.; Donald B. Gillies, V. P. & G. M. Mining; J. E. Ferris, V. P., Sc. & T.; Alfred Tozer, A.; P. H. Owen, P. A.

River Furnaces and Steel Works, Cleveland, Ohio:

River Furnaces: 4 stacks; No. 1, 83' x 20', blt. 1909-10, f. o. May 28, 1910, relined 1918; No. 2, 82' 6" x 20' 9", blt. 1910-11, f. o. June 20, 1912, relined 1917; No. 3, 90' x 22', blt. 1915-16, f. o. May 13, 1916, relined 1919; No. 4, 90' x 22', blt. 1915-16, f. o. Dec. 30, 1916; 16 three-pass center comb. stoves, 95' x 22'; 9 steam blowing eng. (218,000 cfm.); 24 water-tube boilers, 16,872 H. P., serve also coke plant, open hearth and rolling mills; one Uehling double-strand pig casting mach.; slag granulating pit. By-product coke: Lake ore. Product: basic, malleable and foundry pig iron; annual cap., 675,000 tons.

By-product coke plant: 204 Koppers by-product coke ovens, annual cap., 990,000 net tons coke. By-product recovery plant. Koppers benzol plant, annual cap., 475,000 gals. light oil.

Steel Works: const. begun Mar. 13, 1913; first steel made Jan. 20, 1916; 14 B. O. H. fur. (100-ton); one 1,000-ton mixer; six 4-hole soaking pits; 40" 2-h. 1-st. reversing blooming; 21" 2-h. 4-st. cont. billet; 18" 2-h. 8-st. cont. sheet bar and billet mill, 6-st. horizontal and 2-st. vertical. Fuel, coal, prod. gas and coke oven gas. (Formerly owned by The River Furnace Co.; acquired by The McKinney Steel Co., Jan., 1918). Product and annual cap.: 700,000 tons ingots; 1,700 tons steel castings for own use; 245,000 tons slabs, 240,000 tons billets, 70,000 tons sheet bars.

Genessee Furnace, Charlotte, N. Y.: 1 stack, 75' x 18' 3", blt. 1868; last rebt. 1908, relined 1917; 5 center comb. stoves (three 2-pass, 75' x 19' 5", one 2-pass, 85' x 21', one 3-pass, 85' x 19'); 3 steam-blowing eng. (32,700 cfm.); 6 water-tube boilers, 3,018 H. P. Conn. and by-product coke: Lake ore. (Formerly owned by Genessee Furnace Co.; acquired by The McKinney Steel Co., Jan., 1918.) Product: basic, malleable and foundry pig iron; annual cap., 110,000 tons.

Josephine Furnaces, Josephine, Pa.: 2 stacks; No. 1, 80' 3" x 20',

blt. 1906-07, f. o. Jan. 14, 1907, relined 1918; No. 2, 79' 9" x 20' 3", blt. 1907-12, f. o. Aug. 14, 1912, relined 1917; 8 stoves (four 2-pass side-comb. 85' x 21'; four 3-pass center-comb. 90' x 21'); 5 steam blowing eng. (67,700 cfm.); 11 water-tube boilers, 6,036 H. P.; 1 Uehling double-strand pig casting mach. Conn. and by-product coke: Lake ore. (Formerly owned by Josephine Furnace & Coke Co.; acquired by The McKinney Steel Co., Jan., 1918). Product: bessemer, basic, malleable, foundry and forge pig iron; annual cap., 236,000 tons.

Scottdale Furnace, Scottdale, Pa. (leased; owned by United States Cast Iron Pipe & Foundry Co.): 1 stack, 75' 3" x 18' 9", blt. 1872-73, last rebld. 1911, relined 1917; 4 two-pass side comb. stoves (three 75' x 19', one 85' x 21'); 4 steam blowing eng. (43,600 cfm.); 6 water-tube boilers 2,515 H. P. Conn. and by-product coke: Lake ore. (Formerly operated by Scottdale Furnace Co., which company was acquired by The McKinney Steel Co., Jan., 1918). Product: basic, malleable and foundry pig iron; annual cap., 100,000 tons.

Total annual capacity of the 8 blast furnaces 1,121,000 tons pig iron. Company owns or operates iron ore mines on the Gogebic, Mesabi and Menominee Ranges; total annual cap., 2,090,500 tons; Josephine limestone quarry at Williamsburg, Pa.; annual cap., 165,000 tons.

MACHINED STEEL CASTING CO. (The), Alliance, Ohio.

Inc. June, 1919 in Ohio. Capital stock: com. auth. \$1,000,000, issued \$600,000.

W. H. Purcell, P.; W. E. Trump, V. P. & G. M.; F. R. Donaldson, V. P. & G. S. M.; H. Y. Stuckey, Sc.; J. B. Freer, T. & P. A.; R. H. Donaldson, G. S.

Works at Alliance, Ohio: const. begun July, 1919, f. o. Dec. 24, 1919; one 20-ton A. O. H. fur.; building a second 20-ton A. O. H. fur., to be in operation by April, 1920.

Product: steel castings for own use and for sale; annual cap., 10,000 tons.

MACKINTOSH, HEMPHILL & CO., 12th & Etna Sts., Pittsburgh, Pa.

Inc. Feb. 13, 1893 in Pennsylvania. Capital stock: com. auth. \$1,000,000, issued \$1,000,000.

Pennock Hart, Ch.; G. S. Macrum, P. & T.; J. E. Fawell, V. P.; G. W. Baum, V. P.; Donald H. Baum, Sc.; A. W. Bendig, A. Sc. & A. T.; Samuel McMillen, G. S.; Frederick K. Acker, P. A.

Fort Pitt Foundry, 12th and Etna Sts., Pittsburgh: O. H. works blt. and f. o. 1882; 3 A. O. H. fur. (two 15-ton, one 30-ton). Fuel,

nat. gas and oil. Gray iron and brass foundry, and machine shop. Product: steel castings for sale for rolling mill machinery, steel rolls and pinions, general castings; nickel, chrome and vanadium alloy

steel castings. Annual cap., 15,000 tons steel, 3,500 tons gray iron and 150 tons brass castings.

MAHONING VALLEY STEEL CO. (The), Niles, Ohio.

Inc. July 5, 1916 in Ohio. Capital stock: com. \$400,000; pref. 7% cum. \$200,000.

Jacob D. Waddell, P.; T. E. Thomas, V. P. & T.; M. A. Jones, A. Sc.; Frank Forney, C.; M. A. Collins, S.; John N. Kerr, G. S. M.; at Niles. W. Aubrey Thomas, Sc.; at Jenifer, Ala.

Sales offices:

Chicago, George A. Thompson, 1924 Harris Trust Bldg.

Detroit, John E. Love, 1156 Penobscot Bldg.

Hamilton, Ontario, John McCullough, 148 Jackson St., West.

New York, Marcus L. Filley, 50 Church St.

Philadelphia, R. M. Baily Co., Commercial Trust Bldg.

Works at Niles: blt. 1916-17, f. o. May 28, 1917; 8 pair and sheet fur.; 8 sheet mills (three 28" x 36", four 28" x 44", one 28" x 48"); 8 cold mills, 26" x 50"; 3 hand pickling tanks; 2 galvanizing pots (annual cap., 10,000 tons).

Product: black and galvanized sheets, flat and corrugated, cold rolled and polished sheets, black sheets for forming, stamping, enameling, etc., automobile and electric sheets; annual cap., 45,000 tons.

MAINE POWER SALES CO., 25 Broad St., New York, N. Y.

William H. Pouch, P.; Dudley Harde, T. & G. S. A.

Works at Rumford, Maine: electric furnace plant for manufacture of ferro-silicon, f. o. June, 1918. Product: ferro-silicon, bessemer ferro-silicon; annual cap., 7,000 tons.

MALLEABLE IRON FITTINGS CO., Branford, Conn.

Inc. April 12, 1864 in Connecticut. Capital stock: com. \$125,000.

Arthur C. Walworth, P.; at 100 Pearl St., Boston, Mass. L. J. Nichols, Sc.; Alfred E. Hammer, T. & G. M.; V. T. Hammer, G. S.; at Branford.

Works at Branford: two 2-ton converters (1 Tropenas, 1 Stoughton); one 5-ton A. O. H. fur. oil-fired added in 1918; 4 cupolas (3 for pig iron, 1 for spiegel); foundry and machine shop for pipe fittings and general machine jobbing; galvanizing plant.

Product: small and medium steel castings for own use and for sale; castings for high-pressure pipe fittings, valves, ship work, general machinery, etc.; nickel, chrome and vanadium alloy steel castings. Annual cap., 5,000 tons converter and 5,000 tons open-hearth steel castings; 2,000 tons semi-steel and 12,000 tons malleable iron castings.

MALLEABLE STEEL AND IRON CO., 1602 Hoge Bldg., Seattle, Wash.

Inc. July, 1919 in Washington. Capital stock: com. auth. \$10,000, issued \$9,000.

A. N. Edwards, P.; at 410 Olive St., St. Louis, Mo. A. E. Greene, V. P. & G. M.; F. D. Evets, Sc.; at Seattle.

Works at 1163 Minneapolis St., Tacoma, Wash.: one $\frac{1}{2}$ -ton Greene electric fur. f. o. Nov., 1919; installing one $\frac{3}{4}$ -ton Greene electric fur. for gray iron castings; 1 cupola, gray iron and malleable iron foundry.

Product: steel castings, manganese steel castings, annual cap., 1,000 tons.

Manhattan Reduction Co., New York, built a plant at 219 Barron St., Jersey City, N. J., in 1915, for the manufacture of ferro-tungsten and tungsten metal, f. o. Feb., 1916 (four electric furnaces). Manufacture of tungsten products was discontinued in 1917. Company out of business.

MANITOBA ROLLING MILL CO., Ltd., 875 Logan Ave., Winnipeg, Manitoba, Canada.

Capital stock: com. auth. \$500,000, issued \$212,600; bonds \$116,000.

T. R. Deacon, P.; H. B. Lyall, V. P., Sc. & T.

Works at Selkirk, Manitoba: blt. 1914; 4 heat. fur. (two 3-d., two 4-d.); 2 busheling fur.; 16" 3-h. 3-st. bar mill; 12" 3-h. 1-st. and 9" 3-h. 5-st. Belgian; 1 squeezer. Fuel, coal. Will install in 1920 one 10-ton A. O. H. fur., annual cap., 7,000 tons ingots.

Product: merchant bar iron; annual cap., 18,000 tons.

MANITOBA STEEL FOUNDRIES, Ltd., 1204 McArthur Bldg., Winnipeg, Manitoba, Canada.

Inc. 1915 in Dominion of Canada. Capital stock: com. auth. \$300,000, issued \$150,000.

Thomas Arnold, P.; at Montreal, P. Q. A. M. Tirbutt, V. P., G. M., G. S. M. & P. A.; F. J. Manning, Sc. & T.; J. E. Davey, G. S.; at Winnipeg.

Sales offices: 503 Bank of Toronto Bldg., Montreal and 1204 McArthur Block, Winnipeg.

Works at Selkirk, Manitoba: blt. 1916, f. o. early in 1917; 2 Snyder electric fur. (2-ton).

Product: steel castings for sale, annual cap., 6,000 tons.

MANSFIELD SHEET AND TINPLATE CO., Mansfield, Ohio.

Inc. Nov. 30, 1914. Capital stock: com. 50,000 shares, no par value; pref. 8% cum. auth. \$3,000,000; bonds \$135,000.

W. H. Davey, P. & T.; C. F. Ackerman, 1 V. P.; Samuel Davey, 2 V. P. & G. M.; A. I. Davey, 3 V. P. & Sc.; W. R. Jenkins, A. & P. A.; F. W. Beach, G. S. M.

Sales offices:

Detroit, George W. House, Ford Bldg.

Toronto, Canada, Edwin Schofield, 24 Dalhousie St.

Works at Mansfield: blt. 1908-09, f. o. June, 1909; 12 sheet and 12 pair fur.; 7 black sheet mills, 30" x 42"; 5 black plate (tin) mills, 28" x 34"; 14 cold mills, 26" x 52"; 24 box annealing fur.; 4 Mesta

4-arm pickling mach. Fuel, coal and gas. Building 6 black sheet mills, 30" x 42", 1 black plate (tin) mill, 28" x 30", to be completed about June, 1920, and will increase total cap. to 100,000 tons. Building 32" 3-h. blooming, 24" sheet bar mill to be completed Dec., 1920. Plan to build four 75-ton B. O. H. fur.

Product: black, blue annealed, electric and automobile sheets, polished, deep drawing, stamping, enameling and all special finished sheets; black plate for tinning; annual cap., 50,000 tons (35,000 tons black sheets, 15,000 tons black plate).

MANUFACTURERS IRON & STEEL CO., New Brunswick, N. J.

Inc. May 29, 1917 in New Jersey. Capital stock: auth. \$8,000,000; com. issued \$3,600,000; pref. 7% cum. issued \$2,586,700. James W. Johnson, P.; Robert C. Nicholas, V. P. & Sc.; George F. McCormick, T.; at New Brunswick. H. Morley Holten, A. T.; at Catasauqua, Pa.

The company owns the following plants:

Bryden Horse Shoe Works, Catasauqua, Pa.

Neverslip Works, New Brunswick, N. J.

Neverslip Works, Montreal, Canada.

Bryden Horse Shoe Works, Catasauqua, Pa.: est. 1882; rolling mill added 1889-90; f. o. April, 1890; 19 heat. fur. (fifteen 3-d., four 4-d.); 2 gas producers; 20" 3-h. 1-st. breakdown, 10" 3-h. 4-st. finishing; two 9" 3-h. 4-st. finishing; 6 steam hammers (three 1,200-lb., three 1,400-lb.). Fuel, coal. (Formerly owned by Bryden Horse Shoe Co.; acquired by Manufacturers Iron & Steel Co., June 2, 1917).

Product: horseshoe bars, horse and mule shoes; racing and trotting plates; annual cap., 10,000 tons horseshoe bars, 1,000 tons forged horse and mule shoes.

Neverslip Works, New Brunswick, N. J.: est. 1896. Product: calks, horseshoes, wrenches, taps, side cutting pliers.

Neverslip Works, Montreal; est. 1910. Product: calks and wrenches.

MARION STEAM SHOVEL CO. (The), Marion, Ohio.

Inc. Aug. 9, 1884 in Ohio. Capital stock: com. auth. \$1,500,000, issued \$1,346,700.

Frank A. Huber, P. & T.; Charles B. King, V. P. & G. M.; Harry C. Barnhart, Sc. & P. A.; H. T. Bell, A.; C. N. Chandler, C.; J. W. Fellmeth, G. S.; F. H. King, G. S. M.

Sales offices:

Atlanta, Ga., C. W. Fries, 299 Lee St.

Bankok, Siam, United Engineers, Ltd.

Billings, Montana, F. B. Connelly Co. (agents).

Brisbane, Queensland, Australia, British Australian Machy. Co.

Buenos Aires, Argentina, Dutihl-Smith, McMillan & Co.

Chicago, Ill., 1442 Monadnock Bldg.

Dallas, Texas, Fred B. Wright.

Denver, Col., H. W. Moore & Co., (agents).

Detroit, Mich., W. H. Anderson Tool and Supply Co.
 Johannesburg, South Africa, South African General Electric Co.
 Manila, P. I., Pacific Commercial Co. (agents).
 Melbourne, Victoria, Australia, British Australian Machy. Co., Ltd.
 Montevideo, Uruguay, Dutihl-Smith, McMillan & Co.
 Montreal, Canada, F. H. Hopkins & Co. (agents).
 New York, N. Y., 2083 Hudson Terminal Bldg., 50 Church St.
 Petrograd, Russia, Russian Land Reclamation Co., Ltd., (agents).
 Philadelphia, Pa., H. L. Cox.
 Pittsburgh, Pa., John W. Patterson (agent).
 Portland, Ore., Clyde Equipment Co.
 Rio de Janiero, Brazil, Dutihl-Smith, McMillan & Co.
 Salt Lake City, Utah, H. W. Moore & Co.
 San Francisco, Cal., 741 Monadnock Bldg.
 Sao Paulo, Brazil, Dutihl-Smith, McMillan & Co.
 Seattle, Wash., Clyde Equipment Co. (agents).
 Singapore, United Engineers, Ltd. (agents).
 Stockholm, Sweden, Graham Brothers (agents).
 Sydney, Australia, British Australian Machinery Co., Ltd. (agents).
 Toronto, Ont., F. H. Hopkins & Co.
 Vancouver, B. C., Canada, Vancouver Machinery Depot, Ltd. (agents).

Works at Marion : Steel Dept. blt. 1900-01 ; f. o. Feb., 1901 ; 1 B. O. H. fur. (20-ton) ; 3 hydraulic forging presses (50-ton, 350-ton, 400-ton).
 Fuel, oil, nat. and prod. gas. Foundry and machine shop.

Product: steam shovels, dipper, suction and elevator dredges ; ditchers, ballast unloaders, log loaders, etc. ; steel ingots and castings for own use and for sale ; manganese steel castings. Annual cap., 4,000 tons steel ingots, 8,000 tons steel castings, 1,500 tons manganese steel castings, 6,300 tons gray iron and semi-steel castings.

Mark Manufacturing Co., Chicago, Ill., incorporated June 5, 1916.
 Works at Zanesville, Ohio., Evanston, Ill., and Indiana Harbor, Ind. Company consolidated with the Iroquois Iron Co. to form the Steel & Tube Company of America, July, 1918.

MARSHALL, EDWARD E., Bullitt Bldg., Philadelphia, Pa.

Lochiel Furnace, Harrisburg, Pa. : 1 stack, 75' x 13'6", blt. 1872, f. o. April, 1873 ; remod. 1886 and 1917 ; 4 Whitwell stoves, 60' x 20' ; 2 steam blowing eng. (18,500 cfm.) ; 5 water-tube boilers, 1,250 H. P. ; 1 slag granulating pit, annual cap., 35,000 tons. Anthracite coal and coke ; foreign and domestic ore. (Formerly owned by Pennsylvania Steel-Co. ; acquired by Bethlehem Steel Co., March 1, 1916, and purchased by E. E. Marshall in May, 1917 ; sold to Central Iron and Steel Co., July, 1917, and leased to E. E. Marshall).

Product: standard ferro-manganese, spiegeleisen and pig iron.

Annual cap., 18,000 tons ferro-manganese; or 36,000 tons spiegeleisen; or 50,000 tons pig iron.

Graham Furnace, Graham, Va.: 1 stack, 70' x 15', blt. 1890; 3 Whitwell stoves, 60' x 18'; 3 steam blowing eng. (38,000 cfm.); 20 tubular boilers, 2,500 H. P. Pocahontas coke: local and Lake ores. (Formerly owned by Virginia Iron, Coal & Coke Co.; acquired by Pocahontas Pig Iron Corp., Aug. 13, 1917; acquired by Roanoke Consolidated Iron Corporation, Oct. 1, 1919, and leased to Edward E. Marshall.)

Product: foundry pig iron, annual cap., 40,000 tons; or spiegelseien, 20,000 tons; or ferro-manganese, 10,000 tons.

MARTING IRON & STEEL CO. (The), Ironton, Ohio.

Inc. Feb. 15, 1899 in Ohio. Capital stock: com. auth. \$2,000,000, issued \$1,877,865.

Dr. A. C. Lowry, P.; M. M. Reif, Sc.; William G. Sharp, G. M.; C. B. Fowler, G. S.; at Ironton. C. E. Sullivan, T.; at Cleveland. Sales agents: The Matthew Addy Co., Cincinnati, for foundry pig iron; all other sales direct. Brand: "Nellie."

Product: basic, malleable and foundry pig iron; total annual cap., 320,000 tons.

Alice Furnace, Ironton, Ohio: 1 stack, 87' x 19' 6", f. o. Sept. 13, 1875, rebt. 1899, relined 1916; 4 stoves (1 McKee 100' x 21', 1 Foote 85' x 21', 2 Whitwell 75' x 21'), a second McKee stove building; 4 steam blowing engines; 6 water-tube and 6 flue boilers, 3,000 H. P.; one Heyl & Patterson single-strand pig casting mach. By-product coke: Lake ore. Blanche Furnace (alternate stack) abandoned in 1918. Product: basic, malleable and foundry pig iron; annual cap., 150,000 tons.

Ironton Furnace, Ironton, Ohio: 1 stack, 75' x 18' 6", blt. 1907-08, f. o. Nov. 21, 1908, relined 1919; 4 Foote stoves, 85' x 21'; 4 steam blowing eng.; 2 water-tube and 12 flue boilers, 2,140 H. P.; one Heyl & Patterson single-strand pig casting mach.; Dwight & Lloyd sintering plant under construction, annual cap., 50,000 tons. By-product coke: Lake ore. Product: basic, malleable and foundry pig iron; annual cap., 100,000 tons.

Lawrence Furnace, Culbertson, Ohio: 1 stack, 65' x 16' 6", blt. 1889-90, f. o. Mar., 1891, last rebt. 1905-06; 4 stoves (3 Gordon 65' x 20', 1 center comb. 75' x 18'); 3 steam blowing eng.; 2 water-tube and 8 flue boilers, 1,640 H. P. By-product coke: Lake ore. Product: basic, malleable and foundry pig iron; annual cap., 70,000 tons.

Maryland Steel Co., Sparrow's Point, Md., see 1916 Directory, p. 210; sold to the Bethlehem Steel Co., Bethlehem, Pa., March 1, 1916.

Massachusetts Iron & Steel Co., see p. 397.

MASSILLON ROLLING MILL CO. (The), Massillon, Ohio.

Inc. Feb. 20, 1909 in Ohio. Capital stock: com. \$1,750,000; pref. 7% cum. \$1,750,000.

R. E. Bebb, P. & G. M.; C. C. Chase, V. P. & M.; J. B. Imler, Sc.; I. M. Taggart, T.; W. P. Miller, A.; H. I. Taggart, S. M.; D. M. Pitcock, G. S.; Glenn Farrell, P. A.

Works at Massillon: blt. 1908-09, f. o. Mar. 23, 1909, 11 pair and 11 sheet fur.; 8 black sheet mills (28" x 38" and 28" x 44"); 3 black plate (tin) mills (28" x 34"); 11 cold mills (28" x 52"); 12 single box annealing fur.; 2 Mesta pickling mach., one hand pickling tank. Fuel, coal and nat. gas.

Product: special finished black sheets for enameling and automobile work, annual cap., 45,000 tons.

MASSILLON STEEL CASTING CO. (The), Massillon, Ohio.

Inc. July 10, 1917 in Ohio. Capital stock: com. \$250,000.

E. H. Birney, P.; F. H. Snyder, V. P.; F. O. Humberger, Jr., Sc.;

I. M. Taggart, T.; A. H. Anthony, G. M.; C. E. Nordfeldt, G. S.

Sales offices:

Cleveland, E. H. Geyer, 1778 Coventry Road.

Detroit, W. R. Badgett, 1349 Book Bldg.

Indianapolis, H. C. Williamson, City Trust Bldg.

New York, Joseph E. Vincent, Jr., Liberty Tower Bldg.

Works at Massillon, Ohio: blt. 1917-18, f. o. Feb. 8, 1918; one 2-ton Stoughton converter; 1 cupola.

Product: cast steel motor truck wheels, small steel castings up to 250-lb. for sale, annual cap., 3,600 tons.

MATTHEWS IRON & STEEL CO., Rome, Ga.

Inc. 1917 in Georgia. Capital stock: com. \$1,000,000; bonds \$75,000.

H. S. Matthews, P.; Graham Wright, Sc.; J. C. Godwin, T.

Brand: "Silver Scotch."

Silver Creek Furnace at Rome, Ga.: 1 stack, 65' x 13'; blt. 1890-91; rebld. 1909-10; relined 1917; three 4-pass stoves (50' x 17'); 2 steam blowing eng.; 3 water-tube boilers, 1,050 H. P. Coke: local brown and red hematite ore. Company owns 14 charcoal kilns at Rome, Ga. (not used). (Formerly owned by Michigan Trust Co., Receiver for Richard G. Peters; acquired by Matthews Iron & Steel Co., Dec. 29, 1917).

Product: high-silicon, low-phosphorus pig iron; annual cap., 30,000 tons.

MAY (FRANK L.) & CO., Inc., 99 John St., New York, N. Y.

Inc. July 24, 1916 in New Jersey. Capital stock: com. \$100,000.

Frank L. May, P.; E. A. Reinhart, V. P.; A. C. Kaufmann, Sc. & T.

Company has works at Perth Amboy, N. J. and Yalesville, Conn., for manufacture of ferro-alloys by chemical processes, ferro-alloys first made 1916. Electric power for Perth Amboy plant from Public Service Corp. of New Jersey.

Product: tungsten metal powder, ferro-tungsten, ferro-molybde-

num, ferro-vanadium, ferro-chromium and specialties. Annual cap., 300 tons tungsten; other alloys as required, tonnage indeterminate.

MAYNARD ELECTRIC STEEL CASTING CO., 22nd Avenue & Kilbourn Road, Milwaukee, Wis.

Inc. May 15, 1912 in Wisconsin. Capital stock: com. auth. \$85,000, issued \$85,000; pref. 8% auth. \$40,000, issued \$22,000. Formerly Maynard Steel Casting Co., name changed to Maynard Electric Steel Casting Co. in May, 1918.

S. J. Wabiszewski, P. & T.; L. Bergner, V. P.; J. K. Fons, Sc.; O. H. Schildknecht, A., G. S. M. & P. A.; F. J. Wabiszewski, G. M. Sales offices: Chicago, 1001 McCormick Bldg.; Detroit, 289 Bellevue Ave.

Works at 22nd Ave. & Kilbourn Road, Milwaukee: blt. 1918; 2 electric fur. (one 3-ton Moore, one 1-ton Rennerfelt). Formerly operated plant at 716 Reed St., Milwaukee. Construction of new plant begun in May, 1918. Moore fur. installed and Rennerfelt fur. transferred from old plant. Crucible fur. abandoned.

Product: steel castings for general purposes for sale, annual cap., 4,800 tons.

Memphis Mining & Mfg. Co., Winborn, Miss., see 1916 Directory, p. 212. Ole Miss Furnace at Winborn was leased to Thomson Operating Co. in spring of 1917. Lease expired April 28, 1919, and property reverted to owner, Mrs. William Warmack, Lamkin, Miss.

MERCHANT & EVANS CO., 2013-35 Washington Ave., Philadelphia, Pa.

Inc. Jan. 5, 1894 in Pennsylvania. Capital stock: com. auth. \$600,000, issued \$500,000; pref. 6% cum. auth. \$400,000, issued \$260,000.

Powell Evans, P.; Thomas Evans, 1 V. P.; James D. Evans, 2 V. P.; C. E. Hanna, Sc. & T.; William E. Waters, G. S. M.

Sales offices: Atlanta, Healy Bldg.; Baltimore, 232 St. Paul St.; Chicago, 347 Sheldon St.; Cleveland, 315 Champlain Ave.; Kansas City, 24th & Jefferson Sts.; New York, 242 Water St.; St. Louis, Wright Bldg.

Works at Wheeling, W. Va.: blt. 1912; 7 tinning sets, four for charcoal tinplates, three forterne plates. Fuel, coal.

Product: tinplates and terne plates, annual cap., 35,000 base boxes tinplates, 40,000 base boxes terne plates.

MESTA MACHINE CO., P. O. Box 1124, Pittsburgh, Pa.

Inc. Dec. 1, 1898 in Pennsylvania. Capital stock: com. auth. \$2,000,000, issued \$1,600,000; bonds \$708,000.

George Mesta, P.; F. E. Mesta, 1 V. P. & G. S.; C. J. Mesta, 2 V. P.; H. F. Wahr, Sc.; J. O. Horning, T.; W. E. Hundley, A.; W. G. Sullivan, C.; J. B. Connally, P. A.

Selling agents: Shook & Fletcher Supply Co., Brown-Marx Bldg., Birmingham; L. R. Coffin, Holbrooke Bldg., San Francisco; Nelson, Lodge & Snyder, Widener Bldg., Philadelphia.

Works at Mesta Station, P. R. R., West Homestead, Pa.: blt. 1899; first steel made Nov. 21, 1899; 4 A. O. H. fur. (two 35-ton, two 50-ton); one cupola; 7 air fur. Fuel, nat. gas, oil and coal. Machine shop for own use to complete machinery for sale.

Product: steel rolls and general machinery castings and machine moulded gears for sale and own use; gray iron castings up to 200,000 lbs. for sale. Alloy steel ingots and castings. Annual cap.; 75,000 tons ingots, 25,000 tons steel castings, 40,000 gray iron and 300 tons brass castings.

Principal articles of manufacture; heavy gas and steam engines of all types, heavy rolling mill machinery, hydraulic presses, condensers, pickling machines, heavy forgings, etc.

METAL ALLOYS, Inc., Watervliet, N. Y.

Inc. Mar. 7, 1918 in New York. Capital stock: com. auth. \$500,000, issued \$285,000.

H. G. Batcheller, P.; Parker Corning, 1 V. P.; E. Palmer Gavit, 2 V. P.; S. P. Sweetser, Sc.; Edwin Corning, T.; E. F. Bainbridge, G. M.; E. R. Benner, P. A.

Selling agent: Corning & Co., 165 Broadway, New York.

Works at Watervliet, N. Y.: f. o. 1918; 9 electric fur. Electric power from Adirondack Electric Power Corp.

Product: ferro-tungsten, ferro-chrome and ferro-vanadium; annual cap., 600 tons.

METAL & THERMIT CORPORATION, 120 Broadway, New York, N. Y.

Inc. 1908 in New Jersey. Capital stock: com. \$2,250,000; pref. 7% cum. \$1,000,000. (Formerly known as Goldschmidt-Thermit Co.).

William T. Graham, P.; at 501 Fifth Ave., New York. Hubert E. Rogers, V. P. & Sc.; at 60 Wall St., New York. R. H. Isman, T.; F. H. Hirschland, G. M.; Fred W. Cohen, A. G. M.; H. B. Atkins, A. T.; W. R. Hulbert, S. M. Thermit Dept.; A. F. Braid, S. M. Metal-Alloys Dept.

Sales offices: Chicago, Pittsburgh, San Francisco, St. Louis, and Toronto.

Company operates plants at Chrome, N. J., and East Chicago, Ind., for detinning tin scrap and producing pig tin and tin tetrachloride; also operates plant at Wyandotte, Mich., for production of liquid chlorine; operates plant at Jersey City, N. J., for manufacture of "Thermit" and rare metals and carbon-free ferro-alloys.

Plant at Jersey City, N. J.: f. o. 1914; ferro-alloys manufactured by aluminothermic process.

Metro Steel Co., Pittsburgh, see 1916 Directory, p. 213. Works at Pittsburgh, Pa., dismantled in 1916.

Miami Iron & Steel Co. (The), Hamilton, Ohio, see 1916 Directory, p. 213. The Miami Furnace at Hamilton was taken over by the Hamilton Furnace Co., Hamilton, Ohio, March 22, 1917.

MIAMI METALS CO., 122 South Michigan Ave., Chicago, Ill.

Inc. Feb. 18, 1916 in Illinois. Capital stock: com. \$100,000; pref. 7% cum., \$500,000.

Francis H. Hardy, P.; Herman A. Brassert, V. P.; C. D. Tripp, V. P.; Truman F. Miller, Sc. & T.

Selling agent: Pickands, Brown & Co., McCormick Bldg., Chicago.

Product: ferro-manganese and spiegeleisen.

The company leases Furnace "A" at the Iroquois Works of the Steel & Tube Company of America and Victoria Furnace, Goshen, Va., owned by Southeastern Iron Corporation, see those companies. Lease of Furnace "A" given up April 21, 1920.

MICHIGAN STEEL CASTING CO., Guoin St., Detroit, Mich.

Inc. Mar., 1907 in Michigan. Capital stock: com. auth. \$400,000, issued \$314,900; pref. 7% cum. auth. \$100,000, issued \$81,100.

R. F. Flintermann, P. & G. M.; Hobart B. Hoyt, V. P.; E. B. Caulkins, Sc., T. & G. S. M.; A. F. Rupp, A.; J. F. Montils, A. G. M.; A. Van Eschen, G. S.; K. V. Laskey, P. A.

Sales agents:

Buffalo, Marvine Gorham, 422 Prudential Bldg.

Cleveland, C. E. Stamp Co., Citizens Bank Bldg.

Philadelphia, Redmond Engineering Co., Drexel Bldg.

Works at Detroit: blt. 1907; first steel made Jan., 1910; three Heroult electric fur. (two 3-ton, one 6-ton); one 2,000-lb. Detroit electric fur. for special alloy castings; first electric steel made, Oct. 21, 1915; Tropenas converters dismantled in 1916.

Product: small steel castings (under 1,500-lb.) for sale, for automobiles, trucks and general machinery; annual cap., 18,000 tons.

Michigan Trust Co. (The), Receiver for Richard G. Peters, Grand Rapids, Mich., see 1916 Directory, p. 214. Rome Furnace sold to Matthews Iron & Steel Co., Dec. 29, 1917.

Michigan Trust Co. (The), Grand Rapids, Mich., see 1916 Directory, p. 214. The furnace at Trussville, Ala., was sold to the Birmingham-Trussville Iron Co., April, 1917.

MID-CONTINENT IRON CO., Security Bldg., Kansas City, Mo.

Inc. June 30, 1917 in Delaware. Capital stock: com. \$2,225,000; pref. 7% cum. \$750,000.

F. D. Larabee, P.; E. H. Busiek, V. P. & G. M.; Frank Stevens, Sc.; F. S. Larabee, T.; E. S. Richardson, A.; A. K. Brain, P. A.; at Kansas City. H. Watson, S.; at Midco, Mo.

Selling agents: Domhoff & Joyce Co.

Brand: "Larabee."

Midco Furnace, Midco, Mo.: 1 stack, 64' x 13' 6", blt. 1918, blown in Dec. 11, 1918; two 2-pass side-comb. stoves, 74' x 18' 6"; 2 steam blowing eng. (12,000 cfm.); 5 water-tube boilers, 2,000 H. P., serve wood chemical plant also. Charcoal: local red and brown hematite ore. Company owns 16 charcoal retorts at Midco, annual cap., 3,600,000 bushels charcoal, and by-product recovery plant; owns Barrett Mine, Taskee, Mo., annual cap., 75,000 tons and Mosselle Mine, Phelps Co., Mo., annual cap., 40,000 tons.

Product: warm blast charcoal pig iron, annual cap., 36,000 tons.

Midland Electric Steel Co., 565 West Washington Blvd., Chicago, Ill., incorporated July 15, 1917; built plant at Terre Haute, Ind.; one 4-ton Booth-Hall electric furnace, f. o. Jan. 1, 1918. The electric furnace was dismantled in August, 1918. Company out of business.

MIDLAND IRON & STEEL CO., Ltd., Midland, Ont., Canada.

Inc. May 25, 1918 in Dominion of Canada Capital stock: com. \$1,000,000.

James Playfair, P. & G. M.; M. E. Tully, Sc.; D. S. Pratt, T.; E. Heist, S.; at Midland. A. E. R. Schneider, V. P.; at Cleveland, Ohio.

Midland Furnace, Midland: 1 stack, 65' x 15', blt. 1900, f. o. Dec. 4, 1900; relined 1918; 3 two-pass stoves, 60' x 16'; 4 steam blowing eng.; 6 water-tube boilers, 1,500 H. P. Conn. coke: Lake ore. Gray iron foundry, annual cap., 1,000 tons. (Formerly operated by Canada Iron Foundries, Ltd.; acquired by Midland Iron & Steel Co., Ltd., May 1, 1918.)

Product: foundry, malleable and bessemer pig iron, annual cap., 35,000 tons.

MIDVALE STEEL & ORDNANCE CO., 14 Wall St., New York, N. Y.

Inc. Oct. 5, 1915. Capital stock: com. auth. \$150,000,000, issued \$100,000,000.

W. E. Corey, Ch.; A. C. Dinkey, P.; W. B. Dickson, V. P. & T.; Robert Brewster, Sc.; Marshall Lapham, C.; at 14 Wall St., New York. A. A. Corey, Jr., V. P. in charge of operations; John C. Neale, V. P. & G. S. M.; D. Brewer Gehly, V. P.; J. M. Milliken, A.; F. C. Yeates, P. A.; at Widener Bldg., Philadelphia.

Sales offices:

Atlanta, Candler Bldg.

Boston, 40 Court St.

Chicago, McCormick Bldg.

Cincinnati, Union Trust Bldg.

Cleveland, Swetland Bldg.

Detroit, Penobscot Bldg.

New York, 165 Broadway.

Philadelphia, Widener Bldg.

Pittsburgh, Oliver Bldg.
 St. Louis, Chemical Bldg.
 Salt Lake City, Newhouse Bldg.
 San Francisco, Monadnock Bldg.
 Seattle, Colman Bldg.
 Washington, D. C., Woodward Bldg.

Export sales representative : Consolidated Steel Corporation, 165 Broadway, New York.

Product : basic, bessemer, low-phosphorus, foundry and forge pig iron, spiegeleisen and ferro-manganese; ingots, blooms, billets, slabs and sheet bars; rails, rail joints and fastenings; mine ties; structural shapes, universal and sheared plates, boiler, ship, tank and fire box plates, flanged products; charcoal blooms, skelp, lap-welded knobbled charcoal iron and steel boiler tubes; merchant bars, rounds, squares, flats; tire, toe calk, discs, seats, cold rolled steel, plow shapes, rake teeth, harrow teeth, finger bars, automobile and other special sections, pipe bands; railroad carriage and automobile spring steels; twisted and deformed concrete bars; wire rods, plain and galvanized wire, barbed wire, woven wire fencing, bale ties, wire nails and staples; car and locomotive axles, shafting, crank pins, piston rods and side rods, ordnance forgings, castings, marine and stationary forgings; steel cars, underframes, trucks, forged and pressed car parts; rolled and built wheels, locomotive and truck tires, gear blanks, fly wheels, and annular sections; carbon and high speed tool steel; naval guns, army guns and howitzers, armor plate, high explosive shells and projectiles. Iron ore, limestone, coal, coke, tar, ammoniacal liquor, sulphate of ammonia, benzol products.

Properties : Midvale Steel & Ordnance Co. owns and operates plants as follows :

Nicetown Works, Nicetown, Philadelphia, Pa.

Coatesville Works, Coatesville, Pa.

Wilmington Works, Wilmington, Del.

The company also owns a controlling interest in Cambria Steel Co. with plants at Johnstown, Pa., for description of plants and properties see Cambria Steel Co. The Midvale Steel and Ordnance Co. owns the entire capital stock of the Midvale Steel Co., Worth Brothers Co., Midvale-Cambria Co., Buena Vista Iron Co., Cuba, Ramapo Ore Co., Union Coal and Coke Co.; and stock interest in the Hanna Ore Mining Co., Hoyt Mining Co., Bennett Mining Co. and Plymouth Mining Co.

Nicetown Works, Philadelphia, Pa. : 3 B. O. H. fur. (one 20-ton, two 50-ton); 7 A. O. H. fur. (two 30-ton, five 50-ton); one 6-ton electric fur.; 2 crucible steel fur. (66 pots total); 2 cupolas; gray iron, semi-steel and bronze foundry; three 2-d. heat. fur.; 15" 3-h. 2-st., 12" 3-h. 5-st. and 8" 3-h. 5-st. bar mills; 5 steam hammers (2-ton to 10-ton); 7 hydraulic forging presses (500-ton

to 10,000-ton). Armor plate dept. Product and annual cap.: 186,750 tons ingots (45,000 tons basic, 132,000 tons acid open hearth, 5,250 tons electric, 4,500 tons crucible); 3,750 tons steel castings (3,000 basic O. H., 750 electric); 18,000 tons gray iron, chilled iron and semi-steel castings, 240 tons bronze castings; 25,000 tons steel bars, carbon and alloy tool steel; 90,000 tons forged products.

Wilmington Works, Wilmington, Del.: orig. blt. 1868; first steel made Aug. 23, 1900; 5 B. O. H. fur. (50-ton); four 1-hole soaking pits; 34" 2-h. 1-st. reversing blooming mill; 18" and 9" bar mills dismantled and for sale. Gray iron foundry (1,200 tons). (Formerly owned and operated by Wilmington Steel Co.; merged in Midvale Steel & Ordnance Co., Nov. 1, 1917). Product and annual cap.: 135,000 tons ingots, 115,000 tons blooms and billets.

Coatesville Furnaces: 3 stacks; No. 1, 85' x 21', blt. 1908-10, f.o. May 10, 1910, remodeled 1917; No. 2, 85' x 21', blt. 1909-11, f.o. Dec. 4, 1912; No. 3, 95' x 22', blt. 1916-17, f.o. Aug. 22, 1917; 12 stoves (8 central, comb., 90' x 22', 4 side comb. 2-pass, 100' x 22'); 4 gas blowing eng., 6 steam blowing eng. (150,000 cfm.); 14 water-tube boilers, 7,000 H.P., serve also plate mills and electric power plant; 2 Heyl & Patterson double-strand pig casting mach. Coke: foreign and domestic ores. (Formerly owned by Worth Brothers Co.; acquired by Midvale Steel & Ordnance Co., Oct. 13, 1915). Product: basic, low-phosphorus, foundry and forge pig iron, annual cap., 450,000 tons.

Brandywine Works, Coatesville, Pa.:

Open Hearth Dept.; blt. 1895-96, first steel made June, 1896; 24 B. O. H. fur. (six 40-ton, ten 50-ton, eight 70-ton); 400-ton metal mixer; 114 gas producers. Fuel, prod. gas and oil. Product: steel ingots, annual cap., 650,000 tons. Rolling Mill Dept.; orig. blt. 1881; 8 heat. fur. (four 1-d., four 3-d.); 14 soaking pits; 40" 2-h. 1-st. blooming mill; 4 sheared plate mills (28" x 72" 2-h., 36" x 114" 3-h., 42" x 132" 3-h., 42" x 152" 3-h.); 5 hydraulic forging presses (750-ton to 2,500-ton); flanging and dishing plant to handle heads to 136" diameter, flanging rectangular plates, irregular heads for marine and locomotive boilers, etc. Fuel, prod. gas and coal. (Formerly owned by Worth Brothers Co.; acquired by Midvale Steel & Ordnance Co., Oct. 13, 1915.) Product: sheared plates, annual cap., 310,000 tons; shell forgings, 70,000 tons.

Valley Works, Coatesville, Pa., dismantled in 1918 and 1919.

Viaduct Works, Coatesville, Pa.: blt. 1838; 6 heat. fur.; two 20" 2-h. 1-st. bar mills; one 25" x 54" skelp plate mill. Erecting skelp mill with 3-h. roughing, 2-h. planishing, and 2-h. scarfer, annual cap., 45,000 tons. Fuel, bit. coal. Charcoal forge; blt. 1900; 26 charcoal fires, one 3-ton and 2 helve ham. (Formerly owned by

Worth Brothers Co.; acquired by Midvale Steel & Ordnance Co. Oct. 13, 1915). Tube mill; 6 lap-weld fur. for tubes 1½" to 6". Product: charcoal blooms from scrap, annual cap., 25,000 tons; boiler tube skelp, 30,000 tons; and boiler tubes, 25,000 tons.

Miles, W. A., Copake Falls P. O., N. Y.

Brand: "Copake."

Copake Iron Works: 1 stack, 32' x 9', blt. 1872; cold and warm blast; open top; iron stoves; 1 steam blowing eng. Charcoal: Columbia County ore.

Product: charcoal pig iron; annual cap., 5,000 tons. Last active in 1903. Gray iron foundry (annual cap., 500 tons) and chilled plow works are connected with the furnace.

MILLBURY STEEL FOUNDRY CO., Millbury, Mass.

Inc. Aug. 31, 1908 in Massachusetts. Capital stock: com. auth. \$50,000, issued \$50,000; pref. 8% cum. auth. \$50,000, issued \$48,200.

Fred W. Moore, P. & T.; Henry H. Merriam, V. P.; William W. Brierly, Sc., G. M. & P. A.

Works at Millbury: blt. 1902, f. o. 1902; one 2-ton Heroult electric fur., f. o. Nov., 1917; crucible steel fur. (40-pots) dismantled in 1918.

Product: electric steel castings for automobiles and machinery, annual cap., 1,000 tons.

MILTON IRON CO. (The), Wellston, Ohio.

Inc. July 14, 1916 in Ohio. Capital stock: com. \$200,000.

H. S. Willard, P.; H. S. Willard, Jr., Sc., T. & G. S.

Sales agents: Domhoff & Joyce Co., at Chicago, Cincinnati, Cleveland, Indianapolis, and St. Louis

Brand: "Milton."

Milton Furnace at Wellston: 1 stack, 65' x 13'; blt. 1873-74, last rebt. 1912; 4 fire-brick stoves (two 65' x 15', one 75' x 18', one 85' x 18'); 3 vertical steam blowing eng. (25,000 cfm.); 4 tubular boilers, 600 H. P. W. Va. coke and raw coal: Lake ore. (Formerly owned and operated by Wellston Steel & Iron Co.; acquired by Milton Iron Co., June 5, 1916.)

Product: Jackson County silvery pig iron, annual cap., 18,000 tons.

MILTON MFG. CO. (The), Milton, Pa.

Inc. 1893 in Pennsylvania. Capital stock: com. auth. \$750,000, issued \$600,000.

George S. Shimer, P.; George S. Shimer, Jr., 1 V. P.; R. W. Krise, 2 V. P.; O. H. Reinhart, Sc.; W. B. Clinger, T.; T. M. Miles, G. M.

Works at Milton: blt. 1886-87; f. o. Feb., 1889; 1 single and 4 double puddling fur.; 1 rotary squeezer; 8 heat. fur. (six 4-d., two cont.); 20" 3-h. 1-st. puddle mill; 20" 3-h. 3-st. bar; two 16" 3-h. 2-st. bar; two 10" 3-h. 4-st. bar mills; 1 steam ham.; 8 hydraulic

forging presses (350-ton to 700-ton). Nut and washer department. Fuel, bit. coal, powd. bit. coal.

Product and annual cap.: muck and scrap bars (15,000 tons), merchant bar (20,000 tons), bolts and nut rods (28,000 tons); hot pressed and cold punched nuts, washers, etc. (50,000 kegs).

MILWAUKEE ROLLING MILL CO., New Beloit Road, Milwaukee, Wis.

Inc. March 5, 1920 in Wisconsin. Capital stock: com. 15,000 shares; pref. 7% cum. 15,000 shares.

John I. Beggs, P.; Walter Kasten, V. P.; Robert Baird, Sc.; Earl Steward, T.; Boyd B. Jack, G. M.

Building sheet mill plant at Milwaukee with 8 combination sheet and pair furnaces; 8 hot black sheet mills (six 28" x 38", two 28" x 56"); 4 stands cold rolls (three 24" x 48", one 24" x 54"); 4 double box annealing fur.; 2 pickling mach.; 4 galvanizing pots.

Product: black and galvanized sheets; annual cap., 50,000 tons black sheets, 35,000 tons galvanized sheets.

MILWAUKEE STEEL FOUNDRY CO., 101-131 South Water St., Milwaukee, Wis.

Inc. Nov., 1903 in Wisconsin. Capital stock: com. \$150,000.

Burton C. Wait, P. & G. M.; F. A. Weiss, V. P.; C. W. Inglis, Sc.; A. G. Eissler, T.; John Gessner, A.; I. A. McIntyre, P. A.; at 101 South Water St., Milwaukee. Charles Gordon, G. S. M.; at 120 Wisconsin St., Milwaukee.

Works at South Water St., Milwaukee: blt. 1903-04, f. o. Mar. 15, 1904; 3 Tropenas converters (2-net tons each); one 3-ton Heroult electric fur.; one cupola. Fuel, coke and electricity.

Product: steel castings for sale; nickel, chrome and vanadium alloy steel castings; gear blanks, gears, die blocks and castings for motor trucks and tractors. Annual cap., 4,000 tons converter and 3,000 tons electric steel castings.

Minneapolis Crucible Steel Co., Minneapolis, Minn., see 1916 Directory, p. 217, acquired by Minneapolis Electric Steel Castings Co., May 1, 1917.

MINNEAPOLIS ELECTRIC STEEL CASTINGS CO., 38th Ave. N. E. & 5th St., Minneapolis, Minn.

Inc. May 1, 1917 in Minnesota. Capital stock: com. auth. \$100,000, issued \$55,825; pref. 7% cum. auth. \$50,000, issued \$100. G. L. Fort, P. & T.; S. V. Wood, V. P. & G. M.; R. A. Wood, Sc. & P. A.

Works at Minneapolis: one 1500-lb. Snyder electric fur. added 1917; first electric steel made May 1, 1917; crucible fur. dismantled, 1917. (Formerly Minneapolis Crucible Steel Co.; acquired by Minneapolis Electric Steel Castings Co., May 1, 1917.)

Product: steel castings, annual cap., 1,000 tons.

MINNESOTA STEEL CO., Duluth, Minn.

Inc. June 10, 1907 in Minnesota. Subsidiary of the United States Steel Corporation.

Elbert H. Gary, P.; W. J. Filbert, Sc.; Richard Trimble, T.; at 71 Broadway, New York. George L. Reis, V. P. & G. M.; S. B. Sheldon, G. S.; B. F. Burch, A.; George D. Swift, A. Sc. & A. T.; R. E. Mace, P. A.; at Duluth, Minn. Edwin S. Mills, G. S. M.; at Chicago.

Works at Morgan Park, Duluth, Minn.:

Blast Furnaces: 2 thin-lined stacks; No. 1, 90' x 22' 6", blt. 1910-15, f. o. Nov. 29, 1915, relined 1918; No. 2, 90' x 22' 6", blt. 1910-16, f. o. Feb. 19, 1916, relined 1919; ten 3-pass McClure stoves (105' x 22' 6"); 5 gas-blowing eng. (100,000 cfm.); one single-strand chain conveyor type casting mach.; four slag granulating pits, annual cap., 150,000 tons. By-product coke: Lake ore. Product: basic pig iron: annual cap., 310,500 tons.

By-product coke plant: 90 Koppers by-product ovens, by-product recovery plant and Carl Still benzol plant. Annual cap., 375,000 net tons coke.

Steel Works: blt. 1911-15, first steel, Dec. 11, 1915; first rolled products, Dec. 13, 1915; 10 B. O. H. fur. (75-ton); one 600-ton mixer; 3 cont. heat. fur.; five 4-hole soaking pits; 40" 2-h. 1-st. blooming; 28" 2-h. 6-st. and 28" 3-h. 2-st. comb. mill; cont. merchant mill with 16" 2-h. 9-st. roughing, 14" 3-h. 3-st., 10" 2-h. 2-st. and 8" 2-h. 2-st. finishing. Fuel, coal, prod. gas and coke oven gas. Product and annual cap.: 540,000 tons ingots; 495,000 tons blooms and billets; 450,000 tons hot rolled products including 330,000 tons blooms, slabs, billets and sheet bars and 120,000 tons merchant bars.

MISSISSIPPI VALLEY IRON CO., 6500 South Broadway, St. Louis, Mo.

Inc. Jan. 16, 1916 in Delaware. Capital stock: com. \$4,000,000; pref. 7% cum. auth. \$1,000,000, issued \$640,000.

Edward F. Goltra, P.; T. S. Maffitt, V. P.; Robert A. Bagnell, Sc.; E. O. J. Wallace, T. & P. A.

Furnace at 6500 So. Broadway, St. Louis: 1 stack, 80' x 17', blt. 1869, f. o. 1870, last rebt. 1920; 4 stoves (one 90' x 21', two 90' x 20', one 90' x 18'); 2 vertical steam blowing eng. (32,000 cfm.); 4 water-tube boilers, 1,600 H. P. By-product coke: Lake, Missouri and Iowa ores. (Formerly owned by St. Louis Blast Furnace Co.; acquired by State National Bank of St. Louis, Nov. 26, 1912; acquired by Mississippi Valley Iron Co., Mar., 1916.) Company owns and operates iron mines at Puxico, Missouri and Waukon, Iowa, annual cap., 75,000 tons.

Product: basic, malleable and foundry pig iron, annual cap., 144,000 tons.

MISSOURI IRON & STEEL CORP., International Life Bldg., St. Louis, Mo.

F. J. Stuart, Ch. & G. M.; William R. Haight, P.; W. S. Walker, V. P.; F. F. Rimsa, T.; Walter Mayne, Sc.

The corporation purchased in 1917 the blast furnace known as Jefferson Furnace, formerly owned by Jefferson Iron Co., and located at Jefferson, Marion County, Texas: one stack, 60' x 12', blt. 1889-91 and blown in Mar. 15, 1891; hot blast; iron pipe stoves; fuel, charcoal. The furnace was torn down and is now being re-erected at Haigart, near Brandsville, Howell County, Missouri.

The corporation also took over the Haight Orchard & Development Co., which owned in fee about 8,000 acres of land in Howell and Oregon Counties, Missouri; also acquired the ore properties of the Kingsbury Mining Co. and Carson Iron Mining Co., West Plains, Mo., which owned about 2,400 acres.

MITCHELL-DIGGINS IRON CO., Ford St., Cadillac, Mich.

Inc. Feb. 21, 1905 in Michigan. Capital stock: com. \$200,000. C. T. Mitchell, P.; W. L. Saunders, V. P.; F. E. Neahr, Sc.; J. C. Ford, T., G. M. & G. S. M.; W. A. Carpenter, G. S.; D. C. Lamoreaux, P. A.

Brand: "Cadillac."

Cadillac Furnace, Cadillac: 1 stack, 60' x 12', blt. 1905-06, f. o. Mar., 1906, relined 1913; 3 Kennedy stoves; 1 steam blowing eng. (35,000 cfm.); 3 water-tube boilers, 250 H. P. Charcoal: Lake ore. Forty charcoal retorts at Cadillac, annual cap., 3,000,000 bushels charcoal; and by-product recovery plant.

Product: warm blast charcoal pig iron; malleable, foundry and special iron, annual cap., 40,000 tons.

MODERN STEEL CASTING CO., 1400 Thirty-third St., Milwaukee, Wis.

M. L. Henderson, P.; Walter Hoffman, V. P.; Edward Riemer, Sc. & T.; Leo G. Smith, G. M.

Works at Milwaukee: one Whiting converter, first converter castings made March, 1917.

Product: steel castings, annual cap., 1,500 tons.

Moffat-Irving Steel Works, Ltd., Toronto, Canada, see 1916 Directory, p. 218; acquired by Alloy Steel Works, Ltd., Nov., 1917; last named company went into liquidation, April 16, 1919.

MOHAWK IMPROVEMENT CO., Fort Plain, New York.

Inc. Dec. 26, 1913 in New York. Capital stock: com. \$500.

A. D. Sheffield, P., A. & P. A.; at Fort Plain. R. U. Fitting, Sc. & T.; at 60 Wall St., New York City.

Selling agents: New York City, Parsons, Klapp, Brinkerhoff & Douglas, 60 Wall St.

Works at Fort Plain: ferro-alloys first made in 1916; one resistance type electric fur. Electric power from Mohawk Hydro-Electric Co. Product: ferro-silicon, annual cap., 1,000 tons.

MONARCH FOUNDRY CO., Sacramento & Oak Sts., Stockton, Cal. Inc. June 11, 1907 in California. Capital stock: com. auth. \$25,000, issued \$20,425.

E. H. Noack, P.; G. M. & P. A.; A. L. Healey, V. P.; L. L. Venter, Sc.; George Damon, G. S.

Works at Sacramento & Oak Sts., Stockton: one 3,000-lb. Heroult electric fur. added 1915-1916, f. o. June 15, 1916.

Product: electric steel castings for sale and for own use, annual cap., 1,000 tons. Make gray iron, semi-steel, brass and bronze castings; centrifugal pumping machinery and engines.

MONARCH STEEL CASTINGS CO., 316 Solvay Ave., Detroit, Mich. Inc. Dec. 20, 1905 in Michigan. Capital stock: com. \$200,000.

James T. McMillan, P.; James R. Coulter, Sc. & T.; at 804 Union Trust Bldg., Detroit. E. L. Nelson, V. P. & G. M.; Charles Gifford, G. S. M.; W. H. Frederick, P. A.; at 316 Solvay Ave., Detroit.

Works at 316 Solvay Ave., Detroit: blt. 1906, f. o. July 20, 1906; one 20-ton B. O. H. fur. Tropenas converter dismantled in April, 1918. Fuel, oil.

Product: steel castings, annual cap., 7,000 tons.

MONONGAHELA IRON & STEEL CO., 307 Oliver Bldg., Pittsburgh, Pa.

Inc. May 12, 1917 in West Virginia. Capital stock: com. auth. \$900,000, issued \$300,000.

W. B. Eichleay, P.; J. H. Hillman, Jr., V. P.; A. B. Sheets, V. P.; Thomas Watson, Sc.; J. H. Creighton, G. M. & T.

Works at Paden City, W. Va.: blt. 1903-05, f. o. 1906; 24 double puddling fur.; 1 squeezer; one 2-d. heat. fur.; 20" 3-h. 1-st. muck mill; 4 hot black sheet mills (one 26" x 44" roughing; one 26" x 44", two 26" x 38" finishing); one cold mill (22" x 44"). Fuel, nat. gas and pulv. coal. Sheet mills not operating. (Formerly owned by Carter Iron Co.; acquired by Vulcan Iron & Steel Co., August 22, 1917; name of latter company changed to Monongahela Iron & Steel Co., in 1919.)

Product: muck bar, melting bar, annual cap., 20,000 tons.

MONROE STEEL CASTING CO., Monroe, Mich.

Inc. Jan. 12, 1912, in Michigan. Capital stock: com. auth. \$100,000, issued \$94,000; pref. stock 7% auth. \$10,000, none issued.

Silas A. King, P. & G. M.; at Monroe. August Loeffler, V. P. & T.; at Wyandotte, Mich. J. P. Wakefield, Sc., & S. M.; at Toledo, Ohio.

Works at Monroe: blt. 1910-11, f. o. Feb. 21, 1911; two 3,000-lb.

electric fur. (one Snyder, one Booth-Hall); first electric steel, Oct. 1, 1916. Crucible furnace dismantled in 1917.

Product: steel castings for sale, annual cap., 7,000 tons. Railway and general machinery castings; lead and cyanide pots, carbonizing boxes from special alloy.

MOORHEAD, BROTHER & CO., Inc., Sharpsburg, Pa.

Inc. Jan. 15, 1894 in Pennsylvania. Capital stock: com. \$400,000. John Moorhead, Jr., P.; T. D. Moorhead, V. P. & T.; E. A. Hughes, Sc.

Vesuvius Iron and Nail Works, Sharpsburg, Pa.: blt. 1846; 34 single puddling fur.; one squeezer; 9 regen. heat. fur. (four 3-d., five 4-d.); one 4-ton ham.; 23" 2-h. 2-st. muck; 20" bar with 20" 3-h. 1-st. roughing, 20" 2-h. 2-st. finishing; 16" bar with 16" 3-h. 1-st. roughing, 16" 2-h. 2-st. finishing; 30" x 100" sheared plate mill with separate 2-h. roughing and 3-h. finishing stands.

Product: bar, boiler, sheet, tank and skelp iron and steel; annual cap., 21,000 tons muck bar, 50,000 tons bars, 50,000 tons plates.

MORELAND MOTOR TRUCK CO., 1701 North Main St., Los Angeles, Cal.

Inc. July 31, 1911 in California. Capital stock: com. \$800,000.

R. H. Raphael, P.; C. J. Kubach, V. P.; J. L. Armer, Sc. & T.; W. L. Moreland, G. M.

Company has plant for construction of motor trucks at Los Angeles, and steel foundry at Burbank, Cal.

Burbank Works, Burbank, Cal.: 2 electric furnaces (one $\frac{3}{4}$ -ton Rennerfelt, one $1\frac{1}{2}$ -ton Vom Baur).

Product: steel castings for motor trucks for own use and for sale, annual cap., 3,600 tons.

Morris Iron and Steel Co. (The), Frederick, Maryland, see 1916 Directory, p. 220; company placed in hands of receivers Nov. 20, 1916 and property sold to the Frederick Iron and Steel Co. in April, 1917.

Morton Steel Casting Co., Morton, Pa.

Inc. Aug., 1917 in Delaware. Capital stock: com. auth. \$500,000, issued \$300,000.

C. C. Montgomery, trustee in bankruptcy, 4042 DuPont Bldg., Wilmington, Del.

Works at Morton, Delaware Co., Pa.: blt. 1918, f. o. Aug. 22, 1918; one 20-ton A. O. H. fur. Operated for a short time in 1918; idle and for sale. Product: steel castings, annual cap., 15,000 tons.

MUIRKIRK IRON CO., Inc., care Goodwin & Co., Calvert Bldg., Baltimore, Md.

Inc. Oct. 11, 1917 in Maryland. Capital stock: com. 1,000 shares, no par value; pref. \$50,000; bonds \$7,250.

H. C. Brown, P.; Henry W. Williams, V. P.; R. Mayer, T.;

R. Guy Cochran, Sc.; at Baltimore. Ellery F. Coffin, G.M.; at Muirkirk, Md.

Sales agents: Philadelphia, Hickman, Williams & Co. and Rogers, Brown & Co.; Cincinnati, The Matthew Addy Co.

Brand: "Muirkirk."

Muirkirk Furnace, Muirkirk, Md.: 1 stack, 36' x 8' 8", blt. 1847, rebt. 1888; warm blast; iron pipe stove; one steam blowing eng. (2,090 cfm.); 2 boilers, 111 H. P. Charcoal: local carbonate and limonite ore. Six charcoal kilns, idle. (Formerly owned by The Muirkirk Iron Corporation; acquired by Muirkirk Iron Co., Inc., Oct., 1917.)

Product: warm blast charcoal pig iron, annual cap., 6,000 tons.

Musconetcong Iron Works, Elizabeth, N. J., see 1916 Directory, p. 220; merged in Singer Manufacturing Co., May, 1917.

NAGLE STEEL COMPANY, Pottstown, Pa.

Not incorporated.

L. F. Nagle, Proprietor; E. H. Heydt, A.; G. S. Eastburn, G. S. M.; R. P. Cairnes, P. A.

Owens and operates steel plant at Rahway, N. J., and plate mills at Pottstown and Seyfert Station, Pa., total annual capacity, 60,000 tons sheared plates, ship, tank, boiler, fire box, locomotive fire box and still bottom plates.

Rahway Works, Rahway, N. J.: 2 B. O. H. fur. (one 25-ton, one 40-ton). (Formerly owned by New Jersey Steel Co.; leased Oct. 16, 1916, and purchased Oct. 15, 1918 by Nagle Steel Co.). Product: steel ingots, annual capacity, 31,200 tons.

Glasgow Works, Glasgow Station, Pottstown, Pa.: blt. 1874; three 1-d. heat. fur.; 30" x 96" 2-h. sheared plate mill, plates 10 gage to 1" and up to 84" wide. (Formerly owned by Glasgow Iron Co.; leased Jan. 28, 1916 and purchased Dec. 31, 1917 by Nagle Steel Co.). Product: sheared plates, annual cap., 20,000 tons.

Pottstown Works, Pottstown, Pa.: blt. 1846; seven 1-d. heat. fur.; 25" x 72" 2-h. sheared plate mill; 25" x 54" 3-h. sheared plate mill; 1 double blue annealing fur.; plates 12 gage to 1" and up to 65" wide. (Formerly owned by Potts Brothers Iron Co., Ltd.; purchased by Nagle Steel Co., October 15, 1918). Product: sheared plates, annual cap., 20,000 tons.

Seyfert Works, Seyfert Station, Pa.: blt. 1880-81; seven 1-d. heat. fur.; 2 sheared plate mills (24" x 66" 3-h. and 23" x 66" 2-h.) plates 14 gage to 1" and up to 60" wide. (Formerly owned by Samuel R. Seyfert and Brother, Reading; leased June 1, 1916 and purchased by Nagle Steel Co., Feb. 6, 1919). Product: sheared plates, annual cap., 20,000 tons.

NAPIER IRON WORKS, 611-615 Fourth & First National Bank Bldg., Nashville, Tenn.

Inc. 1890 in Tennessee. Capital stock: com. auth. \$300,000, issued \$260,000; bonds \$243,000.

W. R. Cole, P.; Wm. H. Lindsey, V. P.; R. M. Davis, Sc. & T.; at Nashville. J. W. England, G. S.; at Napier.

Selling agents: Cincinnati, Rogers, Brown & Co.

Brand: "Napier."

Furnace at Napier, Tenn.: 1 stack, 60' x 12'6", blt. 1891, remod. 1897, relin. 1917; four 2-pass fire-brick stoves, 55' x 16'; 2 steam blowing eng. (20,000 cfm.); 5 water-tube boilers, 1,150 H. P. By-product coke: local brown ore. Company owns iron mines at Corning, Tenn., annual cap., 90,000 tons.

Product: foundry pig iron, annual cap., 36,500 tons.

NATIONAL ABRASIVE CO., 5 Dorchester Ave. Ext., Boston, Mass.

Inc. Mar., 1917 in Massachusetts. Capital stock: com. \$250,000; pref. \$400,000. Subsidiary of International Abrasives Corp'n.

Nathan C. Harrison, P.; Herbert L. Sawyer, T.

Plant at Niagara Falls, Ontario, Canada: blt. 1918; three electric fur. Electric power from Toronto Power Co.

Product: 15% ferro-silicon, annual cap., 500 tons. Artificial corundum, 5,000 tons.

NATIONAL ALLOY CO., 25th & Dickinson Sts., Philadelphia, Pa.

Inc. June, 1917 in Pennsylvania. Capital stock: com. \$250,000.

Henry P. Miller, P.; E. O. Miller, V. P.; William J. Miller, Sc. & T. Formerly National Alloy Co., Ltd.

Works at 25th & Dickinson Sts., Philadelphia: make silico-manganese and manganese copper, annual cap., 150 tons; also ground ferro-manganese, ferro-silicon, ferro-chrome, manganese dioxide and chrome ore.

NATIONAL CAR COUPLER CO., Attica, Indiana.

Inc. Jan., 1913 in Illinois. Capital stock: com. \$300,000.

J. W. Harrison, P.; R. J. Harrison, V. P.; G. W. Harrison, Sc. & T. Sales offices: Attica, Indiana; Chicago, Ill., 522 McCormick Bldg.; Murphysboro, Illinois.

Product: acid open hearth steel ingots and castings, couplers, centering devices, knuckles, tractor castings, etc; total annual cap., 36,000 tons.

Works at Attica, Ind. (owned): blt. 1906-07, f. o. May 18, 1907; three 20-ton A. O. H. fur. Fuel, oil and coal. Product: acid open hearth steel castings for sale, from 1-lb. to 60,000-lb. Passenger car, locomotive and industrial car couplers; centering devices, Hinson emergency knuckles, annual cap., 24,000 tons.

Works at Murphysboro, Ill. (leased; owned by Harrison Steel Castings Co.): blt. 1917-18, f. o. May 31, 1918; one 20-ton A. O. H. fur. Product: acid open hearth steel castings 1-lb. to 30,000-lb., railroad and misc. castings, annual cap., 12,000 tons.

NATIONAL ENAMELING & STAMPING CO., 411 Fifth Ave., New York, N. Y.

Inc. Jan. 21, 1899 in New Jersey. Capital stock: com. auth. \$20,000,000, issued \$15,591,800; pref. 7% cum. \$10,000,000; bonds, April 1, 1919, \$2,150,000.

George W. Niedringhaus, P.; George V. Hagerty, T.; R. D. Samuels, A. Sc. & A. T.; at 411 Fifth Ave., New York. Thomas K. Niedringhaus, V. P.; at St. Louis. William H. Matthai, V. P.; at Baltimore. Edward H. Schwartzburg, Sc.; at Milwaukee.

Sales offices:

Baltimore, Md., Ohio Ave. & Light St.

Chicago, Ill., 346 Kinzie St.

Granite City, Ill., Steel Works.

Milwaukee, Wis., St. Paul Ave.

New Orleans, La., South Peters & Calliope Sts.

New York, 413 Fifth Avenue.

Philadelphia, Pa., 24th & Walnut Sts.

Product: ingots; universal plates; blue annealed, black and galvanized sheets, black plates for tinning; coke and charcoal tinplates; enameled, japanned, tinned and galvanized stamped ware.

Steel Works Branch, Granite City, Ill.: blt. 1895, f. o. Aug. 31, 1895; ten 60-ton B. O. H. fur.; 28 soaking pits; two 36" 2-h. 1-st. universal mills; one 84" plate mill, one 54" jobbing plate mill; 20 hot black plate mills; 3 hot black sheet mills (two 34", one 38"); 14 cold mills (22" x 32" to 22" x 46") 4 tandems of 3 sets, 1 of two sets; 3 pickling mach. Product and annual cap.: ingots, 350,000 tons; sheet and tinplate bars, billets and universal plates, 300,000 tons; blue annealed and black sheets for deep drawing and enameling, 68,000 tons; black plates for tinning, 30,000 tons. Tinplate works: 23 sets, annual cap., 1,200,000 base boxes coke and charcoal tinplates. Plant for enameled, tinned and stamped ware.

Granite Rolling Mill Branch, 2nd & Destrehan Sts., St. Louis, Mo.: blt. 1879; 6 black sheet mills (five 36", one 42"); 6 sheet and 6 pair fur.; two 42" cold mills; 3 double annealing fur.; 1 pickling mach.; 8 galvanizing pots. Fuel, coal. Product: black and galvanized stamping and sheet steel for "Granite Iron Ware," galvanized sheets, etc., annual cap., 24,000 tons.

STAMPING AND ENAMELING WORKS.

Baltimore, Md., 2 plants:

Matthai, Ingram & Co. Branch, Ohio Ave. & Light St.

Keen & Haggerty Branch, Race & Ostend Sts.

Laurel Hill Branch, Laurel Hill, Long Island, New York.

Granite City Branch, Granite City, Ill.

Milwaukee Branch, St. Paul Ave., Milwaukee, Wis.

New Orleans Branch, South Peters & Calliope Sts., New Orleans, La.

NATIONAL FARMING MACHINERY (The), Ltd., Montmagny Station, Montmagny, P. Q., Canada.

Inc. in Dominion of Canada. Capital stock: com. auth. \$2,500,000, issued \$2,000,000; pref. 7% cum. auth. \$1,500,000, issued \$1,000,000; bonds \$2,000,000.

Charles A. Paquet, P. & G. M.; J. H. Paquet, Sc., T. & P. A.; A. N. Normand, G. S.; J. O. Renaud, G. S. M.; at Montmagny.

Ernest Roy, V. P.; at Quebec.

Sales offices: Quebec, 95 Dalhousie St.; Montreal, 317 Rue St. Jacques.

Works at Montmagny: blt., 1913; 1 Baillot steel converter (1-ton); 2 A. O. H. fur. (20-ton); first converter steel made Nov. 28, 1913; first O. H. steel made Nov. 15, 1916; 2 cupolas. Fuel, crude oil. Installing 20" 3-h. 1-st., 12" 3-h. 1-st., 9" 3-h. 1-st. merchant mill.

Product: steel castings for own use and for sale; chrome and manganese alloy steel castings; annual cap., 26,800 tons (1,800 tons converter, 25,000 tons open hearth), gray iron (2,200 tons), semi-steel (2,200 tons), aluminum (25 tons), and brass (140 tons) castings; merchant bars and agricultural shapes.

NATIONAL FOUNDRY CO., Erie, Pa.

Inc. July 11, 1899 in Pennsylvania. Capital stock: com. auth. \$150,000, issued \$145,000; bonds \$140,000.

E. D. Wetmore, P.; at Warren, Pa. E. W. Sheldon, V. P. & G. M.; A. W. Reichert, Sec. & G. S. M.; A. H. Willis, T. & G. S.; P. L. Lemmon, A.; C. J. E. Burghart, P. A.; at Erie.

Works at Erie: two A. O. H. fur. (5-ton, 25-ton); first steel made, Mar. 4, 1907.

Product: steel ingots, steel castings for sale, annual cap., 5,000 tons ingots, 7,000 tons castings.

NATIONAL LOCK WASHER CO., (The), 65 Johnson St., Newark, New Jersey.

Inc. 1886 in New Jersey. Capital stock: com. \$100,000; pref. 8% cum. \$100,000.

C. H. Loutrel, P.; J. D. Cowan, Sec. & T.; J. H. Horn, G. S. M.; F. E. Dodd, P. A.

Sales offices:

Chicago, R. L. Cairncross, 1535 Lytton Bldg.

Detroit, A. T. Thompson, 1503 Kresge Bldg.

New York, F. B. Archibald, 26 Cortland St.

Product: lock washers, car window equipments, drop forgings, screw machine products, spring steels.

Riverside Works, Riverside, N. J.: blt. 1911, rebt. 1917; 2 heat. fur. (one 4-d. coal-fired; one cont. coal-fired); 14" 3-h. 1-st. roughing, 9" 3-h. 6-st. finishing. (Formerly owned and operated by Cambridge Co., acquired by National Lock Washer Co. in March, 1918.) Product: merchant bars and special shapes for lock washers and other purposes, annual cap., 10,000 tons.

Newark Works, Newark, N. J.: plant for fabrication of lock washers, manufacture of drop forgings, screw machine products, car window equipments, annealing, hardening and tempering.

NATIONAL MALLEABLE CASTINGS CO. (The), 7706 Platt Ave., S. E., Cleveland, Ohio.

Capital stock: \$8,000,000.

E. L. Whittemore, Ch.; Henry F. Pope, P.; Samuel L. Smith, V. P.; William G. Kranz, V. P.; N. S. Lewis, Sec. & T.

Sales offices:

Chicago, 311 Railway Exchange Bldg., and 2610 West 25th Place.
Cleveland, 7706 Platt Ave., S. E.

Detroit, Mich., 1636 Dime Savings Bank Bldg.

Indianapolis, 5461 Holmes Ave.

New York, 30 Church St.

Philadelphia, 1203 Liberty Bldg.

St. Louis, 1850 Railway Exchange Bldg.

San Francisco, 705 Monadnock Bldg.

Sharon, Pa.

Toledo, Ohio, Corner Front St. & Paine Ave.

Washington, D. C., 616 Munsey Bldg.

Product: O. H. and electric steel castings, automatic steel car couplers, and all kinds of malleable iron castings.

This company owns and operates 10 plants, 6 of which manufacture malleable iron castings, 2 both malleable iron castings and electric steel castings, and 2 steel castings and automatic car couplers.

The malleable iron castings plants are located as follows:

Cleveland Works, 7706 Platt Ave. S. E., Cleveland, Ohio.

Chicago Works, 25th St. near Western Ave., Chicago, Ill.

Chicago Works, 26th St. near Western Ave., Chicago, Ill.

Indianapolis Works, West Michigan St. & Holmes Ave., Indianapolis, Ind.

Toledo Works, Front St., Toledo, Ohio.

East St. Louis Works, 15th and Brady Ave., East St. Louis, Ill.

The malleable iron and electric steel castings plants are located as follows:

Woodhill Road Works, Cleveland, Ohio.

Grant Works, 52nd Ave., Chicago, Ill.

The steel castings plants are located at Melrose Park, Ill., and Sharon, Pa.

Woodhill Road Works, Cleveland, Ohio: blt. 1917-18; first steel made Aug., 1918; two 15-ton Heroult electric furnaces. Product: electric steel castings and malleable iron castings for sale; annual cap., 50,000 tons.

Grant Works, 52nd Ave., Chicago, Ill.: three 6-ton Heroult electric fur. Product: small electric steel castings and malleable iron castings for sale; annual cap., 40,000 tons.

Melrose Park Works, Melrose Park, Ill.: blt. 1884-85; first steel made Feb., 1885; four 30-ton B. O. H. fur. Fuel, coal and oil.

Product: O. H. steel castings and automatic steel car couplers for sale; annual cap., 40,000 tons.

Sharon Works, Sharon, Pa.: orig. blt. 1889-91; 7 B. O. H. fur. (four 30-ton, three 15-ton); 2 Heroult electric fur. (6-ton), f. o. July, 1912. Fuel, coal and oil. Building steel anchor chain plant. Product: open hearth and electric steel castings for sale; automatic steel car couplers; annual cap., 60,000 tons.

The company has acquired the Missouri Malleable Iron Co. and began to operate its plant at East St. Louis, Jan. 1, 1920.

NATIONAL PRESSED STEEL CO. (The), Massillon, Ohio.

Inc. Sept., 1916 in Ohio. Capital stock: com. auth. \$1,500,000,

issued \$1,000,000; pref. cum. auth. \$500,000, none issued.

R. E. Bebb, P.; H. M. Naugle, 1 V. P. & G. M.; F. J. Griffiths, 2 V. P.; A. J. Townsend, 3 V. P. & Works M.; K. R. Jenson, Sc. & T.; A. W. Strauch, A.; J. M. Smith, S.; N. T. Hammer, P. A.

Sales agents:

Chicago, Edwin G. Fisher and Harry G. Masten.

Cleveland, Hamill, Hickox Co.

Detroit, F. Walter Guibert.

New York, R. W. VanHorn.

Philadelphia, John W. Moon.

Works at Massillon, Ohio: blt. 1916-17; f. o. Dec., 1917; 1 cont. heat. fur.; 24" x 38" 2-h. universal plate mill; 19" 2-h. 3-st. strip finishing mill; 6 double annealing fur.; 2 pickling mach. Fuel, powd. coal.

Product: universal plates, tank and bridge plates, annual cap., 75,000 tons; hot rolled strips, 75,000 tons.

NATIONAL ROLLING MILL CO., Vincennes, Indiana.

Inc. 1901 in Indiana. Capital stock: com. \$150,000.

C. B. Kessinger, P.; Edward Watson, V. P.; J. H. Jones, Sc. & T.; S. N. Bradshaw, G. M. & G. S. M.; J. G. Jenkins, G. S.

Works at Vincennes: blt. 1903-04, f. o. Feb. 15, 1904; 1 single puddling fur.; 1 squeezer; four 4-d. coal-fired heat. fur.; 10" 3-h. 4-st. and 8" 3-h. 4-st. bar mills.

Product: iron and steel merchant bars, annual cap., 20,000 tons.

NATIONAL STEEL CASTING CO., Montpelier, Indiana.

Inc. 1897 in Indiana. Capital stock: com. \$200,000.

G. Max Hoffmann, P.; F. E. W. Scheimann, T. & A.; at Fort Wayne, Ind. T. C. Neal, G. M. & G. S. M.; Glenn Ayers, P. A.; at Montpelier. D. F. Bash, Sc.; at Indianapolis.

Works at Montpelier: blt. and f. o., 1896; two 15-ton A. O. H. fur.; four 8-pot crucible fur. Fuel nat. gas and oil Own gas wells.

Product: general steel castings for sale from 5-lb. to 20,000-lb.; car couplers, knucklers, railroad and mining and electrical machinery castings. Annual cap., 5,000 tons open hearth and 1,350 tons crucible steel castings.

National Steel Casting Co., New Cumberland, W. Va., built plant at New Cumberland in 1916; plant was sold to Thomas R. Heyward, Jr., Pittsburgh in 1918 and later in same year purchased by Amalgamated Machinery Corporation, Chicago, which resold plant to Thomas R. Heyward, Jr., in 1919.

NATIONAL STEEL FOUNDRIES, Bellevue Place & River, Milwaukee, Wis.

Inc. Dec. 29, 1913 in Wisconsin. Capital stock: com. \$5,000.

Subsidiary of National Brake & Electric Co.

R. P. Tell, P.; W. L. Berghoefer, V. P. & G. S. M.; W. K. Boyle,

Sc. & T.; H. C. Miller, A.; P. H. Donovan, G. M.; J. Johnson, G. S.; R. E. Wilson, P. A.

Works at Milwaukee: blt. 1899-00; 2 A. O. H. fur. (one 15-ton, one 5-ton); 2 cupolas. Gray iron and semi-steel foundry.

Product: steel castings for air brakes and electrical machinery, general machinery castings for own use and for sale. Annual cap., 10,000 tons open hearth steel castings, 6,000 tons gray iron and semi-steel castings.

NATIONAL STEEL PRODUCTS CO., 1200 First Ave., Bessemer, Ala.

Inc. 1914 in Alabama. Capital stock: com. \$100,000; pref. 7% cum. \$66,660.

R. S. Bohannon, P; Wm. M. Butler, V. P.; at Bessemer, Ala. A. Luria, V. P.; at New Orleans, La. J. D. Pirrong, Sc.; J. V. Calvin, T.; at Birmingham, Ala.

Sales agents: Fairbanks Co., all agencies; Fairbanks Morse Co., Montreal; A. R. Dyer, 1840 McCormick Bldg., Chicago. Ill.

Works at 12th St. and 1st Ave., Bessemer: one 5-ton A. O. H. fur., construction begun Sept. 10, 1918, f. o. April, 1919.

Product: steel ingots; steel castings for own use and for sale; annual cap., 5,000 tons (2,000 tons ingots, 3,000 tons castings). Easer joints for track scales, excavating rails and guard rails.

National Steel Rolling Co. (The), see p. 397.

NATIONAL TRANSIT PUMP & MACHINE CO., 206 Seneca St., Oil City, Pa.

Inc. Nov. 26, 1915 in Pennsylvania. Capital stock: com. \$2,545,000; pref. 7% cum. \$636,250.

F. D. Williams, P. & G. M.; D. R. Mackenzie, V. P. & T.; S. R. Ball, Sc.; C. C. Baker, A.; J. P. Coffman, G. S.; C. M. Holbrook, P. A.; N. A. Newton, S. M.

Sales offices;

Beaumont, Texas, E. L. Wilson Hardware Co.

Casper, Wyo., Casper Supply Co.

Charlotte, N. C., Thomas B. Whitted, Realty Bldg.

Cleveland, Ohio, C. A. Roberts, Park Bldg.

Denver, Col., Wm. Francis, 519 Foster Bldg.

Houston, Texas, W. H. Gaither, 823 Mason Bldg.

Kansas City, Mo., W. C. McLeod, 320 Reliance Bldg.

New Orleans, La., Globe Supply & Machinery Co.

New York, N. Y., E. F. Walker, 320 Hudson Terminal Bldg.

Philadelphia, Pa., W. P. Valentine, Widener Bldg.

Pittsburgh, Pa., A. Baney, 1421 Farmers Bank Bldg.

St. Louis, Mo., Reeves & Skinner Machinery Co., 2211 Olive St.

Seattle, Wash., Mudge Hoffman Co., 1807 L. C. Smith Bldg.

Tulsa, Okla., Frick-Reid Supply Co.

Works at Oil City, Pa.: one Tropenas steel converter (5-ton), f. o. 1900; 4 cupolas (3 for pig iron, 1 for spiegel); 2 crucible fur. for brass melting; 4-ton reverberatory fur.; 4 tilting brass fur.; 5 ham.

(700 to 2,500-lb.); 300-ton hydraulic forging press; $1\frac{1}{2}$ " and 3" Acme headers. Fuel; oil, coke, gas and coal. Machine shop for own use and for jobbing.

Product: steel, semi-steel, brass, bronze, and iron castings for sale and own use. Annual cap., 1,500 tons steel, 29,250 tons gray iron and 18,000 tons brass castings.

NATIONAL TUBE COMPANY, Frick Bldg., Pittsburgh, Pa.

Inc. Feb. 16, 1899 in New Jersey. Subsidiary of the United States Steel Corporation.

William B. Schiller, P.; Edward Worcester, V. P.; Taylor Allderdice, V. P.; J. H. Nicholson, V. P.; B. C. Moise, Sc. & A.; G. E. Benson, T.; Peter Boyd, G. S.; J. J. Kennedy, G. S. M.; S. M. Lynch, P. A.

Sales offices:

Atlanta, Ga., H. P. Nelson, M. S., Candler Bldg.

Boston, Clifton Wharton, Jr., M. S., John Hancock Bldg. (Sub-sales office).

Chicago, H. S. Raymond, M. S., Cont. & Comm. Bank Bldg.

Denver, Edwin H. Fowle, M. S., Majestic Bldg.

Detroit, A. M. Lally, M. S., Ford Bldg. (Sub-sales office).

New Orleans, Hugo Weidmann, M. S., Maison Blanche Bldg.

New York, Clifton Wharton, Jr., M. S., Hudson Terminal Bldg.

Philadelphia, Clifton Wharton, Jr., M. S., Widener Bldg. (Sub-sales office).

Pittsburgh, A. M. Lally, M. S., Frick Bldg.

St. Louis, Edward Worcester, Jr., M. S., Third Natl. Bank Bldg.

St. Paul, H. S. Raymond, M. S., Pioneer Bldg. (Sub-sales office).

Salt Lake City, Edwin H. Fowle, M. S., Walker Bank Bldg. (Sub-sales office).

National Tube Co. sells all products of The National Tube Co. of Ohio through the above sales offices.

Christy Park Works, McKeesport, Pa.: 15 regen. heat. fur.; 13 hammers (100-lb. to 800-lb.); 2 hammers (2,000-lb. each); 13 hydraulic forging presses (100-ton to 2,000-ton). Product: large diameter seamless tubes, flasks and cylinders, and other tubular job work products, annual cap., 15,500 tons.

Continental Works, Second Ave., Pittsburgh, Pa.: blt. 1862; 32 single puddling fur.; five 4-d. heat. fur., 21 gas prod.; 20" 2-h. 2-st. muck; 18" 3-h. 3-st. skelp; 10" 3-h. 4-st. skelp; 2 butt-weld fur. for pipe $\frac{1}{4}$ " to 2"; 1 lap-weld fur. for pipe 2" to 8". Fuel, coal and prod. gas. Product and annual cap.: 23,000 tons muck bar, 64,200 tons skelp and socket iron, 92,000 tons black pipe.

Ellwood Works, Ellwood City, Pa.: blt. 1895, f. o. June, 1895; 16 heating fur. (one 2-d., one 3-d., three 4-d., three 5-d., 8 cont.); 22" 2-h. 5-st. bar; 30" 2-h. 1-st., 22" 2-h. 1-st., 13" 2-h. 1-st. and 13" 2-h. 5-st. tube mills; 7 steam hammers (150-lb. to 2,000-lb.);

1 hydraulic forging press (150-ton). Gray iron foundry (1,200 tons). Fuel, coal and prod. gas. Product and annual cap.; 175,000 tons seamless tube blanks, 145,000 tons hot finished and cold drawn seamless tubes.

Kewanee Works, Kewanee, Ill., sold to Walworth Manufacturing Company, June 30, 1917.

National Works, McKeesport, Pa.:

Blast Furnaces: 4 stacks, each 90' x 22'; No. 1, blt. 1907, f. o. Oct. 10, 1907, relined 1918; No. 2, blt. 1903-05, f. o. Dec. 28, 1905, relined 1917; No. 3, blt. 1889-90, f. o. Dec. 4, 1890, rebuilt 1908, relined 1913; No. 4, blt. 1890, f. o. May 25, 1891, rebuilt 1919; 10 Massicks & Crooke stoves, 96' 6" x 22', 7 Cowper stoves, 93' 8" x 21'; 9 steam blowing eng. (310,082 cfm.); 33 water-tube boilers, 11,600 H. P., serve also steel works, blooming and slabbing mills; one Uehling four-strand pig casting mach.; 4 slag granulating pits, annual cap., 278,000 tons. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 660,000 tons.

Steel Works: blt. 1892-93, first steel made Dec. 14, 1893; 3 Bessemer converters (8.8-ton); 3 cupolas; one 200-ton mixer; 18 heat. fur. (ten 4-d., 8 cont.); eight 4-hole soaking pits; 40" 2-h. 1-st. blooming; 40" 2-h. 1-st. slabbing; 16" 2-h. 10-st. cont. skelp; 13" 2-h. 10-st. cont. skelp; 34" x 110" 3-h. sheared plate mill; 42" 3-h. universal plate, 25" x 57" top and bottom, 20" x 57" middle, 18" vertical; 6 butt-weld fur. for pipe $\frac{1}{8}$ " to 3"; 12 lap-weld fur. for pipe $1\frac{1}{4}$ " O. D. to 36" O. D. Gray iron and brass foundry (10,200 tons gray iron, 450 tons brass castings). Product and annual cap.: 689,000 tons bessemer ingots; 645,000 tons slabs, blooms and billets; 565,000 tons skelp; 309,000 tons black pipe, 100,000 tons galvanized pipe, 36,000 tons boiler tubes; 900 tons forgings for own use in mill repairs.

National Works, Galvanizing Dept., Versailles, Pa.: 2 galvanizing pots; 3 steam hammers (400-lb., 2,000-lb., 3,000-lb.); one hydraulic forging press (500-ton) annual cap., see above, National Works, McKeesport.

National Works, Republic Dept., 24th St., South Side, Pittsburgh: blt. 1863; 44 single puddling fur.; five 4-d. heat. fur.; 22" 2-h. 1-st. muck; 12" 2-h. 8-st. cont. skelp. Fuel, natural gas and coal. Product and annual cap.: 23,000 tons muck bar, 45,000 tons skelp.

Pennsylvania Works, Second Ave., Pittsburgh, Pa.: 7 lap-weld fur. for pipe 2" to 16". Thread protector shop. Product and annual cap.: 290,000 tons black pipe.

Riverside Works, Benwood, W. Va.:

Blast Furnaces; 2 stacks; No. 1, 73' 6 $\frac{1}{4}$ " x 17' 2", blt. 1871-72, f. o. Feb. 14, 1872, rebt. 1903, relined 1919; No. 2, 82' 6" x 20' 6", blt. 1901-03, f. o. Mar. 12, 1903, rebt. 1906, relined 1919; 8 Massicks & Crooke stoves (four 86' x 21', four 60' x 19' 6"); 6

steam blowing eng. (108,000 cfm.); 16 water-tube boilers 5,384 H. P., serve also steel works, rolling mills, pipe mills and pumping station; one Uehling double-strand pig casting mach.; 2 slag granulating pits, annual cap., 115,000 tons. Conn. and by-product coke: Lake ore. Product: bessemer pig iron, annual cap., 233,000 tons.

By-product coke plant: 120 Semet-Solvay coke ovens and by-product recovery plant, annual cap., 200,000 net tons coke.

Steel Works: blt. 1883-84, first steel made June 11, 1884; 2 Bessemer converters (6½-ton); 3 cupolas; one 250-ton mixer; two 3-hole soaking pits; ten 3-d. regen. heat. fur.; 32" 2-h. 1-st. blooming; five 22" 3-h. 3-st. skelp; 5 butt-weld fur. for pipe ½" to 4"; 2 lap-weld fur. for pipe 2" to 6"; 2 galv. pots. Gray iron (1,820 tons) and steel (250-tons) foundry for own use. Product and annual cap.: 228,000 tons ingots, 197,000 tons slabs, blooms and billets, 178,000 tons skelp; 112,000 tons black pipe, 45,000 tons galvanized pipe.

Syracuse Works, Syracuse, N. Y.: 2 lap-weld fur. for boiler tubes 2" to 4" Product: boiler tubes, annual cap., 23,000 tons.

Total annual capacity: 893,000 tons bessemer pig iron; 917,000 tons bessemer ingots; 46,000 tons muck bar, 842,000 tons slabs, blooms and billets, 800,000 tons skelp, 52,200 tons socket iron, 175,000 tons seamless tube blanks; 803,000 tons black pipe, 145,000 tons galvanized pipe, 59,000 tons boiler tubes; 145,000 tons hot finished and cold drawn seamless tubes, 15,500 tons large seamless tubes, flasks, cylinders, etc.

NATIONAL TUBE CO. (The), Lorain, Ohio.

Inc. Dec. 31, 1903 in Ohio. Subsidiary of the United States Steel Corporation.

William B. Schiller, P.; Edward Worcester, V. P.; Taylor Alderdice, V. P.; B. C. Moise, Sc. & A.; Peter Boyd, G. S.; at Frick Bldg., Pittsburgh, Pa. T. L. Moise, T.; Charles Fell, M.; at Lorain.

Sales agent: National Tube Co., Frick Bldg., Pittsburgh.

Lorain Works, Lorain, Ohio:

Blast Furnaces: 5 stacks; No. 1, 92' 6" x 21' 7½", blt. 1898-99, f. o. July 5, 1899, rebt. 1907; No. 2, 92' 6" x 22', blt. 1898-99, f. o. Aug. 23, 1899, rebt. 1907; No. 3, 87' 6" x 21' 6", blt. 1903-04, f. o. Sept. 9, 1904; No. 4, 87' 6" x 21' 6", blt. 1903-05, f. o. Feb. 20, 1905; No. 5, 92' 6" x 22', blt. 1907, f. o. Sept. 24, 1907, relined 1919; 23 stoves (16 Cowper, 100' x 21', 3 Cowper, 100' x 22'; 4 Massicks & Crooke, 101' x 22'); 10 steam blowing eng. (318,000 cfm.); 60 water-tube boilers, 15,000 H. P., serve also electric power plant; 2 Heyl & Patterson double-strand pig casting mach.; Greenawalt sintering plant for flue dust, annual cap., 145,000 tons. By-product coke: Lake ore. Product: bessemer and basic pig iron, annual cap., 835,000 tons.

By-product coke plant: 208 Koppers coke ovens, annual cap., 943,000

net tons coke. By-product recovery plant. Carl Still benzol plant. Steel Works: orig. blt. 1894-95, first bessemer steel, April 1, 1895, first O. H. steel Jan. 26, 1909; 2 Bessemer converters (12-ton); 12 B. O. H. fur. (80-ton); 3 mixers (two 200-ton, one 425-ton); 4 cupolas; 12 soaking pits (four 4-hole, four 6-hole, four 3-hole); 21 heat. fur. (twelve 4-d., 4 cont., 5 special); 40" 2-h. 1-st. blooming; two 38" 2-h. 1-st. blooming; 28" 2-h. 3-st. rail; 28" 2-h. 3-st. reversing skelp; 14" 2-h. 12-st. cont. skelp; 14" 2-h. 14-st. cont. skelp; 34" x 90" 3-h. sheared plate; 2-h. universal plate mill with roughing stand 30" x 88" and finishing stand 27" x 36"; 6 butt-weld fur. for pipe $1\frac{1}{8}$ " to 3"; 5 lap-weld fur. for pipe $1\frac{1}{2}$ " to 20"; 1 galvanizing pot; 8 steam hammers (800-lb. to 6,000-lb.). Installing 2 additional lap-weld fur. Fuel, coal, prod. gas, coke oven gas and tar. Product and annual cap.: 1,295,000 tons ingots (630,000 tons bessemer, 665,000 tons basic open hearth); 12,000 tons gray iron castings, 25,000 tons ingot molds, 475 tons brass castings; 1,047,000 tons blooms, billets and slabs; 731,000 tons finished hot rolled products, including 207,000 tons rails, 9,000 tons splice bars, 515,000 tons skelp; 345,000 tons black pipe, 60,000 tons galvanized pipe.

New Birmingham Development Co., Rusk, Texas, see 1916 Directory, p. 229, Tassie Belle Furnace dismantled in 1919.

NEW ENGLAND STEEL CASTINGS CO., East Longmeadow, Mass. Inc. April 5, 1918 in Massachusetts. Capital stock: com. \$9,000; pref. cum. \$90,000.

H. G. Meadows, P. & G. M.; P. V. Snow, G. S.; J. E. Toole, P. A.; at East Longmeadow. H. L. Stevens, T.; at 40 Central St., Boston. Works at East Longmeadow: blt. 1918, first electric steel, Oct., 1918; one 2-ton Booth-Hall electric fur.

Product: electric steel castings for sale for general purposes, weights up to 1000-lb., annual cap., 1,000 tons.

New Jersey Steel Co. (The), see 1916 Directory, p. 230. Plant at Rahway, N. J., was leased to Nagle Steel Co., Pottstown, Pa., on October 16, 1916 for a term of two years with option of purchase within that term. Sold to Nagle Steel Co., October 15, 1918. The Tropenas converters formerly in this plant were dismantled and removed in 1916 previous to the execution of this lease.

NEW JERSEY ZINC CO. of Pa. (The), 160 Front St., New York, N. Y. Inc. Aug. 1, 1898 in Pennsylvania. Capital stock: com. \$600,000. Subsidiary of The New Jersey Zinc Co., of New Jersey.

Edgar Palmer, P.; A. P. Cobb, V. P.; J. E. Hayes, V. P.; A. B. Schultz, Sc.; H. S. Wardner, T.; G. F. Wolff, C.; E. V. Peters, G. S. M.; H. Hardenbergh, P. A.; at New York. W. M. Kelsey, G. S.; at Palmerton, Pa.

Sales office: New York, 160 Front St.

Palmerton Furnaces, Palmerton, Pa.: 2 stacks; No. 1, 75' x 17', blt. 1901-03, f. o. Apr. 5, 1904, rebt. 1917; No. 2, 70' 6" x 14' 10", blt. 1905-06, f. o. Sept. 3, 1906, relined June, 1918; 9 two-pass fire-brick stoves, 82' x 20'; 3 steam blowing eng. (60,000 cfm.); 14 water-tube boilers, 10,000 H. P., serve also zinc oxide, spelter works, etc.; 4 slag granulating pits, annual cap., 100,000 tons. Conn. coke: zinc residuum for ore. Company owns and operates limestone quarry at East Allentown, Pa., annual cap., 70,000 tons. Product: spiegeleisen, annual cap., 85,000 tons.

NEW LONDON SHIP & ENGINE CO. (The), Groton, Conn.

Inc. Sept. 27, 1910 in Connecticut. Capital stock: com. auth. \$1,750,000, issued \$1,050,000; pref. 8%, auth. \$1,750,000, issued \$860,400.

Lawrence Y. Spear, P.; Gregory C. Davison, V. P.; Frank T. Cable, V. P. & G. M.; Henry R. Bond, Jr., Sc. & T.; Hugo Momm, G. S.; C. D. Young, P. A.

Sales offices: Boston, Mass., Erwin Cooley, 8 Irvington St.; Seattle, Wash., C. G. Coker, 1907 L. C. Smith Bldg.

Works at Groton, Conn.: 1 Snyder electric fur. (3,000-lb.) added 1917-18, f. o. 1918; 1 cupola. Foundry for gray iron and semi-steel castings. Machine shop.

Product: Diesel engines for submarines, heavy duty Diesel engines for marine and commercial service; electric steel castings for own use and for sale. Annual cap., 200 tons steel castings, 1,500 tons gray iron and 250 tons semi-steel castings.

Newhall Rolling Mill Co., Philadelphia, Pa., see 1916 Directory, p. 230, rolling mill at Hyde, Pa., acquired by Clearfield Trust Co., Clearfield, Pa., May 2, 1916; sold to Dr. C. T. Henning in Dec., 1916 and subsequently taken over by Nickel-Alloys Co., Hyde, Pa.

NEWPORT NEWS SHIPBUILDING & DRY DOCK CO., Washington Ave., Newport News, Va.

Inc. Jan. 28, 1886 in Virginia. Capital stock: com. auth. \$6,000,000, issued \$2,000,000; pref. auth. \$6,000,000, issued \$6,000,000; bonds \$7,600,000.

Homer L. Ferguson, P. & G. M.; J. E. McMurran, A.; at Newport News. F. P. Palen, V. P.; James Plummer, P. A.; at 233 Broadway, New York. C. E. Graham, T.; E. A. Adams, Sc.; at 61 Broadway, New York.

Works at Newport News, Va.: one 2-ton Tropenas converter, f. o. Oct. 1, 1903; one 6-ton Heroult electric fur.; 2 cupolas. Gray iron, semi-steel and brass foundries, operates 3 dry docks and a floating repair shop.

Product: builds and repairs iron and steel vessels, engines, boilers, etc.; steel ingots and steel castings up to 15,000-lb.; nickel and chrome alloy steel ingots for own use. Annual capacity, 500 tons

converter, and 1,100 tons electric steel castings; 800 tons electric steel ingots.

NEWPORT ROLLING MILL CO., 9th & Lowell Sts., Newport, Ky.

Inc. 1891 in Kentucky. Capital stock: com. \$150,000.

A. K. Andrews, P.; Joseph B. Andrews, V. P.; Joseph G. Andrews, T.; F. M. Andrews, Sc.; Howard M. Davis, G. S.

Sales offices:

Dallas, Texas, Robert Eikel, Western Life Bldg.

Denver, Col., R. C. Pate.

New Orleans, La., J. F. Lambert, Audobon Bldg.

Phoenix, Ariz., Arizona Hardware Supply Co.

St. Louis, Mo., E. R. Hensel, Security Bldg.

Works at Newport, Ky.: blt. 1857; 16 hot black sheet mills (30" x 38" and 30" x 44"); 1 jobbing plate mill, 30" x 72"; 3 hot black plate (tin) mills (30" x 38"); 6 cold mills; 12 box annealing fur.; 2 plunger pickling mach.; 8 galvanizing pots (annual cap., 40,000 tons).

Product: black, blue annealed and galvanized sheets, annual cap., 100,000 tons. Roofing, siding and formed products.

NEWTON STEEL CO. (The), Newton Falls, Ohio.

Inc. June, 1919, in Ohio. Capital stock: com. auth. \$2,000,000; pref. 7% cum. auth. \$1,000,000.

E. F. Clark, P.; H. M. Steele, V. P. & G. M.; R. A. Kenworthy, Jr., Sc. & G. M. S.; J. H. Fitch, Jr., T.; W. V. Eaton, A.; F. J. Laskey, P. A.

Works at Newton Falls, Ohio: const. begun July 1, 1919, first sheets made April 12, 1920; 8 sheet and 8 pair fur.; eight hot black sheet mills (one 28" x 54", three 28" x 44", four 28" x 38"); 8 cold mills (26" x 48"); 16 box annealing fur.; 1 Mesta pickling mach.; 1 hand pickling tank. Fuel, pulv. coal.

Product: black sheets (automobile sheets); annual cap., 40,000 tons.

NEW YORK CENTRAL RAILROAD, Grand Central Terminal Bldg., New York, N. Y.

F. W. Brazier, Supt. of Rolling Stock.

East Buffalo Shops, East Buffalo, N. Y.: two 4-d. heat. fur.; Ajax rerolling mill; f. o. Oct., 1916. Fuel, oil.

Product: flat and round iron and steel from scrap for own use; annual cap., 2,150 tons.

NIAGARA ELECTRIC FURNACE CO., Inc., 2nd & Walnut Sts., Niagara Falls, N. Y.

Inc. 1918 in New York. Capital stock: com. \$500.

W. D. Uptegraff, P.; J. M. Uptegraff, T.; at Westinghouse Bldg., Pittsburgh, Pa. B. D. Fuller, V. P.; T. M. Uptegraff, Sc.; at Niagara Falls.

Works at 2nd & Walnut Sts., Niagara Falls (leased; owned by Defiance Paper Co.): one 1,500 K. W. electric furnace; ferro-alloys first made, 1918. Electric power from Niagara Falls Power Co.
Product: ferro-silicon (50%), annual cap., 2,000 tons.

NIAGARA ELECTRIC STEEL CORPORATION, 5 Mechanic St., North Tonawanda, New York.

Inc. Feb. 17, 1913 in New York. Capital stock: com. auth. \$50,000, issued \$27,000.

Carl A. Houck, P., T. & G. M.; T. J. Wilson, V. P.; O. D. Fedderman, G. S.

Works at North Tonawanda (leased; owned by Herschell-Spillman Co.): one 1½-ton Snyder electric fur.; blt. 1915, f. o. July 1, 1915.
Product: electric steel castings for sale, annual cap., 750 tons.

NICETOWN PLATE WASHER CO., Inc., 1824 West Juniata St., Philadelphia, Pa.

Inc. July 2, 1918 in Pennsylvania. Capital stock: com. \$195,000. Wheeler Lord, P. & T.; E. J. Renshaw, V. P. & G. M.

Works at Nicetown, Philadelphia: blt. 1900; two 3-d. scrap heat. fur.; 10" 3-h. 4-st. bar mill.

Product: iron and steel bars, rounds, flats and squares; wrought washers and punched work of all kinds; annual cap., 10,000 tons of merchant bars; 3,500 kegs (200-lb.) of standard and special washers.

NICKEL-ALLOYS CO., 744 Oliver Bldg., Pittsburgh, Pa.

Works at Hyde, Pa.: blt. 1903, f. o. June 22, 1903; puddling fur. dismantled; 22" 3-h. muck; 18" skelp; 14" roughing, 9" finishing bar mills; sheet mill for non-ferrous metal sheets.

Product: iron and steel merchant bars, concrete reinforcing bars, annual cap., 2,500 tons.

NOBLE ELECTRIC STEEL CO., 998 Market St., San Francisco, Cal.

Inc. July 25, 1907, amended Nov. 6, 1914, in California.

Capital stock: com. auth. \$1,000,000, issued \$841,010; pref. 8% cum. auth. \$500,000, issued \$70,030.

H. H. Noble, P.; W. H. French, V. P.; E. E. Mead, Sc.

Works at Heroult, Shasta Co., Cal.: pig iron first made, July, 1907; ferro-alloys first made, 1914; 5 Heroult electric fur. Fuel: electricity, charcoal and coke. Hydro-electric power from Northern California Power Co. Charcoal kilns with by-product recovery plant, annual cap., 1,500 tons charcoal, 1,500 gals. wood alcohol, 60,000 lbs. acetate of lime. Small coke blast furnace, partly erected.

Product and annual cap.: ferro-manganese and silico-manganese (6,000 tons); ferro-silicon (500 tons); ferro-chrome (300 tons).

NORFOLK & WESTERN RAILWAY CO., Roanoke, Va.

Roanoke Foundry: one 3-ton Grönwall-Dixon electric fur. added in 1918, f. o. May, 1918. Gray iron and brass foundry.

Product: steel ingots and castings for own use; locomotive and car castings; car wheels, locomotive cylinders, and brake shoes. Annual cap., 250 tons steel ingots, 750 tons steel castings, 40,000 tons gray iron and 1,200 tons brass castings.

North Alabama Rolling Mill Co., Sheffield, Ala., see 1916 Directory, p. 233. Rolling Mill at Sheffield leased to Armistead & Fulbright, Birmingham, Ala., in 1917 and operated for short time in 1918. Sold for scrap in 1919 and dismantled in 1920.

North Carolina Steel & Iron Co., Salisbury, N. C. Works at Salisbury; two 2-pot crucible fur. Malleable iron and gray iron foundry. Idle and for sale or lease.

Northern Alabama Coal, Iron & Railway Co., New York, see 1916 Directory, p. 233. Talladega Furnace sold to Bird Coal & Iron Co., March 30, 1917; acquired by Alexander Tison, trustee, Feb. 16, 1918.

NORTHERN IRON CO., 1410 Real Estate Trust Bldg., Philadelphia, Pa.

Inc. Mar. 27, 1902 in New York. Capital stock: com. auth. \$300,000, issued \$250,000.

W. S. Pilling, P.; J. R. Pilling, Sc.; T. I. Crane, T.; at Philadelphia. L. P. Ross, G. M.; W. G. Updegrave, A.; at Plattsburgh, New York.

Selling agents: Philadelphia, Pilling & Crane, 1410 Real Estate Trust Bldg.

Brand: "Chateaugay."

Standish Furnace at Standish, N. Y. (leased; owned by Delaware & Hudson Co., Chateaugay Ore & Iron Department): 1 stack, 80' x 15' 6", blt. 1886, rebt. 1905; 4 Cowper stoves, 71' x 16'; 2 steam blowing eng. (22,000 cfm.); 6 water-tube boilers, 1,756 H. P. Conn. coke: local magnetite concentrates.

Product: low-phosphorus pig iron, annual cap., 66,000 tons.

Northern or Cedar Point Furnace formerly operated by this company under lease was returned to the owners. See Witherbee, Sherman & Co.

NORTHERN ORE CO., 908 Widener Bldg., Philadelphia, Pa.

Inc. Mar. 30, 1906 in New York. Capital stock: com. auth. \$50,000, issued \$30,000.

T. I. Crane, P. & T.; Frank B. Haley, Sc. & A.; at Philadelphia. August Heckscher, V. P.; at 50 East 42nd St., New York. W. D. Blackmer, G. M.; at Edwards, N. Y.

Sales agent: Debevoise-Anderson Co., 56 Liberty St., New York.

Keystone Furnace, Island Park, Easton, Pa.: 1 stack, 75' x 10' 6";

blt. 1876, rebt. July, 1918; 3 Cowper stoves, 65' x 16'; 1 steam blowing eng. (12,930 cfm.); 16 boilers, 1,600 H. P. By-product coke from Seaboard, N. J.: pyrites nodules, Benson nodules and Harmony ore. (Formerly owned by Thomas Iron Co.; acquired by Northern Ore Co., June 28, 1917.)

Product: bessemer pig iron, annual cap., 36,000 tons.

Northwestern Iron Co., Milwaukee, Wis., see 1916 Directory, p. 234; acquired by Steel & Tube Company of America.

NORTHWESTERN STEEL & IRON CORP., 2907 Fourth St., S. E., Minneapolis, Minn.

Inc. Oct. 9, 1917 in Minnesota. Capital stock: com. auth. \$300,000, issued \$60,000; bonds, \$70,000.

W. J. Miller, P. & G. M.; E. E. Herrick, V. P. & T.; C. L. Rotzel, Sc.; E. J. Edwards, G. S. Works.

Works at Minneapolis, Minn.: blt. 1910; one 4-ton A. O. H. fur. added 1916, f. o. Aug. 1, 1916; one cupola. Fuel, oil and coke. Gray iron, semi-steel, brass and aluminum foundry. (Formerly owned by Gas Traction Foundry Co.; acquired by Northwestern Steel & Iron Corp., Oct., 1917.)

Product: open hearth steel castings, up to 2 ton, for sale; alloy steel castings. Annual cap., 4,200 tons open hearth steel castings, 3,600 tons gray iron and 1,000 tons semi-steel castings.

Norton Company, New Bond Street, Worcester, Mass.

A small quantity of low grade ferro-silicon is made at Niagara Falls plant, Niagara Falls, N. Y. and Chippawa plant, Chippawa, Ontario, Canada, as a by-product in the manufacture of abrasives.

NORTON IRON WORKS, Front and 22nd St., Ashland, Ky.

Org. and inc. 1872. Capital stock: \$310,000.

T. M. Adams, P. & G. M.; W. B. Seaton, V. P.; R. C. Richardson, Sc.; W. C. Richardson, T.

Brand: "Norton."

Furnace at Ashland: 1 stack, 75' x 17'6", blt. 1873, f. o. Feb. 16, 1874, last remod. 1905-06; 3 Cowper-Kennedy stoves, 70' x 18'; 2 steam blowing eng. (24,000 cfm.); 10 water-tube boilers, 3,200 H. P. Greenawalt sintering plant for flue dust and pyrites, annual cap., 7,000 tons; 1 slag granulating pit. Coke: Lake ore.

Product: bessemer, malleable and foundry pig iron, annual cap., 100,000 tons.

Works at Ashland: f. o. Mar., 1874; burned and rebt. 1883; two 2-d. heat. fur., 2 Smith gas fur.; 1 train (22" 2-h. 2-st.); 47 cut nail machines, 70 wire nail machines. Wire drawing department; galvanizing department with 1 pot. Fuel, nat. gas and coal.

Product: nail plate, tack plate; steel cut nails, cut and wrought spikes; wire, and wire nails and field fencing. Annual cap., 350,000 kegs cut nails and cut and wrought spikes, 420,000 kegs of wire

nails, 30,000 tons of wire, 12,000 tons of galvanized wire, 6,000 tons of annealed wire and 6,000 tons field fencing.

NOVA SCOTIA STEEL & COAL CO., Ltd., New Glasgow, Nova Scotia, Canada.

Inc. 1872 in Province of Nova Scotia.

Capital stock: com. \$15,000,000; pref. 8% cum. \$1,000,000; bonds \$5,691,419.98.

D. H. McDougall, P. & G. M.; Archibald McColl, Sc.; Thomas Green, T.; A. M. Seely, P. A.; George D. McDougall, G. S. New Glasgow Works and C. E.; R. E. Chambers, G. S. Ore Mines and Quarries; at New Glasgow. W. D. Ross, V. P.; at 6 King St. East, Toronto. John Irving, G. S. M.; at Windsor Hotel, Montreal. Thomas J. Brown, G. S. Sydney Mines; at Sydney Mines, N. S.

Sales offices: Montreal, Room 14, Windsor Hotel, and at New Glasgow, Nova Scotia.

Brand: "Scotia."

Scotia Furnace, Sydney Mines, N. S.: 2 stacks (alternate); No. 1, 85' x 18' 10", blt. 1902-04, f. o. Aug. 30, 1904, relined, 1914; No. 2, 80' x 18' 10", blt. 1916-18; 4 Roberts stoves, 85' x 18'; 2 steam blowing eng. (30,000 cfm.); 6 Sterling water-tube boilers, 1,860 H. P.; 1 Uehling single-strand casting machine. By-product coke: Wabana ore. Molten metal to Sydney Mines Steel Works. Product: basic and foundry pig iron for own use, annual cap., 90,000 tons.

By-Product Coke Plant, Sydney Mines: 30 Bauer and 160 Bernard ovens, annual cap., 110,000 net tons. Surplus gas used under boilers; by-products not recovered. Boiler plant with 17 boilers (8 water-tube, 9 fire-tube) 3,676 H. P.

Sydney Mines Steel Works, Sydney Mines: blt. 1904-05; 5 B. O. H. fur. (two 50-ton, three 40-ton); one 200-ton mixer; ingots shipped to New Glasgow and rolled or forged into finished forms. Product: steel ingots, annual cap., 130,000 tons.

New Glasgow Works, New Glasgow, N. S.: blt. 1872; rolling mill blt. 1883, f. o. Aug., 1883; 42 heating fur. (21 two-door, 5 three-door, 16 cont.); 20 gas producers; 28" 2-h. 1-st. blooming; 18" 3-h. 2-st. roughing with 9" 3-h. 6-st. finishing; 9" 3-h. 7-st. guide; 9" 3-h. 6-st. guide; 20" x 48" 3-h. plate mill; 5 double-frame steam ham. (10-cwt. to 5-ton); 3 vertical hydraulic forging presses (two 500-ton, one 4,600-ton). Spike, bolt and rivet factory. Machine shop and structural shops, etc.

Product: mining and tram rails from 12-lb. to 40-lb.; fish plates, tie plates, angle bars; machinery, car, spring and agricultural implement steel; tank and boiler plates; heavy and light structural shapes; merchant bars, twisted concrete bars, spike, bolt, nut and rivet rods; locomotive axles, marine shafting, crank shafting, cold rolled shafting, rudder stalks, rudders and miscellaneous heavy

forgings. Annual cap. ; 95,000 tons of blooms and billets, 30,000 tons slabs ; 22,300 tons tank and boiler plate ; 47,000 tons other finished rolled products ; 7,500 tons railway spikes, 5,000 tons machine and carriage bolts and nuts, 3,000 tons rivets ; 15,000 tons railway, marine, and engine forgings.

The company also owns the Eastern Car Co. at New Glasgow, which builds steel and wooden cars, makes car wheels, etc.

The company owns and operates coal mines at Sydney Mines, annual cap., 500,000 tons ; Wabana red hematite ore mines at Bell Island, Conception Bay, Newfoundland, annual cap., 390,000 tons ; limestone quarry at Point Edward, Nova Scotia, annual cap., 80,000 tons.

OHIO FALLS IRON CO., New Albany, Indiana.

Inc. Aug., 1898 in Indiana. Capital stock: com. \$100,000.

George M. Clark, P.; C. E. Clark, T.; J. T. Clark, G. M.; George W. Weston, A.; Edward S. Short, G. S.; at New Albany. Maurice Joseph, V. P.; David J. Workum, Sc.; at Cincinnati, Ohio.

Brand: "Ohio Falls."

Works at New Albany: orig. blt. 1866; 2 single and one double puddling fur.; 9 scrap fur.; 1 alligator squeezer; six 4-d. reverb. coal-fired heat. fur.; 20" 3-h. 2-st. muck; 16" 2-h. 3-st., 10" 3-h. 5-st., 8" 3-h. 5-st. bar; 12" 2-h. 1-st. Belgian roughing with 10" 3-h. 3-st. finishing; one 5-ton ham.

Product: merchant bars, light structural shapes; wide flats up to 12" wide, iron square root angles for safes. Annual cap., 30,000 tons muck and scrap bar, 60,000 tons merchant bar iron.

Works at Covington, Ky., acquired from Licking Rolling Mill Co., dismantled.

Ohio Iron and Steel Co. (The), Lowellville, Ohio, see 1916 Directory, p. 238. Mary Furnace was sold to the Sharon Steel Hoop Co., Sharon, Pa., Feb. 1, 1918.

OHIO SEAMLESS TUBE CO. (The), Shelby, Ohio.

Inc. Nov. 28, 1916 in Ohio. Capital stock: com. auth. \$7,278,000, issued \$6,888,000; pref. 7% cum. auth. and issued \$1,722,000.

A. C. Morse, P.; Charles H. Wood, G. M.; R. C. Skiles, V. P. & A. G. M.; G. L. Reichert, Sc. & T.; B. C. Endslow, A. Sc. & A. T.; S. D. Inscho, Mill S.; F. L. Benham, S. M. & P. A.

Sales offices:

Chicago, Denton & Anderson, 1150 Peoples Gas Bldg.

Cleveland, Denton & Anderson, 1017 B. of L. E. Bldg.

Detroit, Denton & Anderson, Dime Savings Bank Bldg.

New York, J. P. Hilands, 2 Rector St.

Works at Shelby: blt. 1908-09; f. o. Feb., 1909; 3 piercing mills; three trains (each 20" 2-h. 4-st.); 3 cont. heat. fur.; 6 billet reheate. fur.; 3 hot saw fur.; 32 annealing fur.; 6 gas prod.; 15 pickling tubs; 7 ham. 350-lb. to 800-lb.; 33 cold-drawing benches.

Product: cold drawn seamless steel tubes, annual cap., 36,000 tons.

OHIO STEEL FOUNDRY CO. (The), P. O. Box 586, Lima, Ohio.

Inc. Feb. 17, 1907 in Ohio. Capital stock: com. auth. \$1,000,000, issued \$995,000; pref. 7% cum. auth. \$500,000, issued \$497,600.

J. W. Kaufman, Ch.; at Columbus, Ohio. J. E. Galvin, P.; F. G. Wright, 1 V. P.; J. T. Kaufman, Sc. & T.; D. R. Carpenter, A.; J. R. Hastings, G. S. M.; D. O. Wilson, P. A.; at Lima.

Sales offices: Chicago, Ill., F. W. Graves, 213 Railway Exchange; Lima, Ohio, J. R. Hastings; Springfield, Ohio, H. G. Shook.

Company operates three steel castings plants at Lima, Bucyrus and Springfield, Ohio, total cap., 40,000 tons.

Lima Works, Lima, Ohio: blt. 1907, f. o. Sept. 21, 1907; one 20-ton A. O. H. fur.; 2 annealing pits. Fuel, oil. Building two 20-ton B. O. H. fur. const. begun Dec., 1919, to be completed in June, 1920; annual cap., 36,000 tons. Product: locomotive, car and machinery castings; vanadium alloy steel castings; annual cap., 18,000 tons.

Bucyrus Works, Bucyrus, Ohio: blt. 1906-07, f. o. Mar., 1907; one 15-ton A. O. H. fur.; 5 heat. pits. Fuel, oil. (Formerly owned by Bucyrus Steel Casting Co.; acquired by the Ohio Steel Foundry Co., June 1, 1916). Product: steel ingots and steel car and locomotive castings; alloy steel castings; annual cap., 15,000 tons.

Springfield Works, Springfield, Ohio: blt. 1916, f. o. Sept. 1, 1916; one 4-ton Moore electric fur.; two 2-ton Bessemer converters installed 1916, idle. (Formerly owned by Blackwood Steel Foundry Co.; acquired by The Ohio Steel Foundry Co., March 1, 1917). Product: small electric steel castings; alloy steel castings; annual cap., 7,000 tons.

OIL WELL SUPPLY CO., 215 Water St., Pittsburgh, Pa.

Louis Brown, P.; L. C. Sands, V. P. & G. M.; Grant Hubley, 2 V. P.; Clarke S. Reed, Sc.; D. T. Brown, T.

Sales offices: Fort Worth, Texas; London, England; Los Angeles, Cal.; New York, N. Y.; San Francisco, Cal.; Tampico, Mexico; Tulsa, Okla.; and branch stores in all oil fields.

Company manufactures oil well supplies, boilers, engines, pumps, fittings, drilling tools, etc. Plants at Oil City, Pa.; Pittsburgh, Pa.; Oswego, N. Y.; Bradford, Pa.; Parkersburg, W. Va.; Poplar Bluffs, Mo.; Los Angeles, Cal. Small steel casting plant at Oil City Works, see below.

Imperial Works, Oil City, Pa.: one $\frac{1}{2}$ -ton Snyder electric furnace, f. o., April, 1919. Gray iron (12,000 tons) and malleable iron (4,500 tons) foundry.

Product: steel castings for own use, annual cap., 500 tons.

OKLAHOMA IRON WORKS, P. O. Box 463, Tulsa, Okla.

Inc. 1907 in Indian Territory. Capital stock: com. auth. \$3,000,000, issued \$1,250,000.

J. W. Sloan, P.; P. M. Iverson, V. P.; A. F. Bourne, Sc., T. & P. A.; P. F. Corgiat, A.; William Wright, G. S.; at Tulsa. A. Preyer, V. P.; at The Hague, Holland.

Works at Tulsa, Okla.: one 1-ton Rennerfelt electric fur. blt. 1917, f. o. Dec., 1917; 2 cupolas. Gray iron foundry.

Product: oil well supplies; electric steel castings and gray iron cast-

ings for own use. Annual cap., 350 tons electric steel castings, 3,000 tons gray iron castings.

OKLAHOMA STEEL CASTINGS CO., Tulsa, Oklahoma.

Inc. Jan. 28, 1920 in Oklahoma. Capital stock: com. auth. \$100,000.

Ernest H. Cornelius, P. & G. M.; J. L. McKenzie, V. P. & G. S.; E. R. Turner, Sc. & T.

Works at Tulsa: one 1½-ton Moore electric fur. to be installed in June, 1920, annual cap., 5,000 tons electric steel castings.

Old Dominion Iron & Nail Works Co., Richmond, Va., see 1916 Directory, p. 239; corporate name changed to Old Dominion Iron & Steel Corporation, July, 1917.

OLD DOMINION IRON & STEEL CORP., Belle Isle, Richmond, Va.

Inc. 1858 in Virginia. Capital stock: com. \$360,000.

Thomas S. Wheelwright, P.; H. R. Wayt, V. P. & G. M.; G. B. Williams, A. Sc. & A. T.

Brands: "Old Dominion" bar iron, "Hammer Brand" horseshoes.

Works at Belle Isle, Richmond: two Webb electric fur. (one 3-ton, one 4-ton) installed 1916, f. o. June 23, 1916; 10 double puddling fur.; 1 rotary squeezer; 5 heat. fur. coal-fired (three 3-d., two 4-d.); three 2-d. reheat. fur.; 20" 2-h. 2-st. muck, 18" 3-h. 3-st. bar, 12" 3-h. 1-st. roughing with 10" 3-h. 4-st. finishing, 9" 3-h. 4-st. horse-shoe.

Product: muck bar, refined bar iron, staybolt iron, engine bolt iron; horse and mule shoes; electric steel bars. Annual cap., 8,000 tons electric steel ingots; 6,000 tons steel billets, 6,000 tons muck bar; 60,000 tons finished rolled iron and steel.

Old Dominion Pig Iron Corporation, Roanoke, Va., see Flickwir, David W.

OLIVER CHILLED PLOW WORKS, South Bend, Indiana.

Inc. Oct. 14, 1901 in Indiana. Capital stock: com. \$500,000.

Joseph D. Oliver, P.; James Oliver, 2nd, V. P.; C. F. Cunningham, Sc. & W. M.; Joseph D. Oliver, Jr., T.; T. A. Freeman, C.; C. W. Moore, S.; W. A. Weed, G. S. M.; A. A. Frederick, P. A.

Works at South Bend, Ind.: one 2-ton Whiting converter; 1 cupola; f. o. Mar. 1, 1913. Fuel, coke. Gray iron foundry; 4 cupolas, annual cap., 30,000 tons. Malleable iron foundry; 4 air fur., 15,000 tons.

Product: steel castings for own use, annual cap., 3,000 tons.

OLIVER IRON & STEEL CO., South 10th & Muriel Sts., Pittsburgh, Pa.

Inc. 1889 in Pennsylvania. Capital stock: com. \$1,600,000.

Henry Oliver, P.; Charles Oliver, V. P. & G. M. S.; James C. Rea,

V. P. & Works M.; Henry Oliver Rea, V. P.; Charles E. Black, Sc. & P. A.; John Jenkins, A. Sc.; Ralph Theophilus, T.; J. F. Johnston, A.; J. C. Smith, M. S.

Sales offices: New York, H. L. Usher, 50 Church St.; San Francisco, E. W. Kratzer, Monadnock Bldg.

Works at Pittsburgh: blt. 1863; 8 heat. fur., powdered coal fuel (five 3-d., three cont.); 16" 3-h. 4-st. bar; 11" comb. cont. mill, 12-st. 2-h. cont. and 4-st. 2-h. finishing; 10" 3-h. 6-st. bar; 8" 3-h. 4-st. guide; 12 steam and drop ham. (1,000-lb. to 2,000-lb.). Bolt, nut, rivet and washer factory.

Product: bars and special shapes for own use; track, carriage and machine bolts and coach screws, $\frac{1}{4}$ " to 4"; nuts, $\frac{1}{4}$ " to $2\frac{1}{2}$ ", hex. and square; rivets, $\frac{1}{4}$ " to 2"; washers; hinges, wagon hardware, railway car forgings, railway track tools, telegraph pole equipment, picks, mattocks, crowbars, wedges, and drop forgings. Annual cap.; 100,000 tons rolled products, 800,000 kegs bolts, 139,200 kegs nuts, 95,000 kegs rivets, 28,000 kegs washers, 3,900 tons forgings.

OLIVER IRON MINING CO., Wolvin Bldg., Duluth, Minn.

Subsidiary of the United States Steel Corporation.

W. J. Olcott, P.; Pentecost Mitchell, V. P.; George D. Swift, Sc. & T.; W. W. Watson, Jr., A. Sc.; J. T. Melvin, A. T.; John L. Mullin, A.; W. J. O'Connor, A. A.; J. H. McLean, G. M.; J. H. Hearing, A. G. M.; R. E. Mace, P. A.; at Duluth. J. M. Sias, 2nd A. Sc.; at 71 Broadway, New York.

The company holds in fee or by lease iron ore properties in the Vermilion, Mesabi, Gogebic, Marquette and Menominee Ranges in the Lake Superior region.

The Oliver Iron Mining Co. operates under agreement the active mining properties of the Minnesota Iron Co., the Lake Superior Consolidated Iron Mines, the American Mining Co., the Chapin Mining Co. and other subsidiary mining companies of the United States Steel Corporation.

The mines of the Oliver Iron Mining Co. and other subsidiaries of the United States Steel Corporation in the Lake Superior region are as follows:

Gogebic Range: Davis, Geneva, Norrie-Aurora Group (North Norrie, East Norrie, Pabst, North Pabst, Aurora, North Aurora, and Vaughn), North Newport, Royal, Puritan and Tilden mines.

Marquette Range: Adams, Champion, Goodrich, Lake Superior Group ($\frac{3}{4}$ interest in Section 16, Section 21, Hard Ore, Hematite), Moore Group (Moore, Richards), Platt, Race Course and Winthrop mines.

Menominee Range: Aragon, Chapin Group (Chapin, Millie), Cuff, Iron Ridge, Riverton Group (Dober, Isabella) and Pewabic ($\frac{1}{2}$) mines.

Vermilion Range: Pioneer, Sibley and Soudan mines.

Baraboo Mining District: Iroquois mine.

Mesabi Range :

Virginia District : Higgins, Mountain Iron Group (Mountain Iron, Aetna), Prindle, Sauntry-Alpena Group (Sauntry, Alpena), Shiras, Stephens, Union ($\frac{1}{2}$), Virginia Group (Lone Jack, Mesabi Mountain, Ohio), Shaw, Sharon, Wanless. Eveleth District : Adams Group (Adams, Hull, Nelson, Leonidas), Auburn, Biwabik ($\frac{1}{4}$), Canton, Duluth, Fayal, Genoa Group (Genoa, Sparta), Gilbert Group (Gilbert, Elba), McKinley, Minnewas, Spruce Group (Spruce, Cloquet, Fayal No. 4).

Hibbing District : Burt-Pool, Carson Lake, Day, Donora, Hull-Rust, Kerr, Mahoning ($\frac{1}{5}$), Morris, Penobscot, Philbin, Sellers, Sweeney, Winifred.

Chisholm District : Chisholm, Chester, Clark, Duncan, Hartley Group (Hartley, Burt, Palmer), Humphreys, Leonard Group (Burt, Glen), Monroe-Tener, Myers, Pillsbury, St. Clair.

Canisteo District : Arcturus, Canisteo Group (Canisteo, Walker), Holman Group (Holman, Brown No. 1, Brown No. 2, Diamond), Hill Group (Hill, Delaware), Judd.

In addition to the foregoing mines the subsidiary companies own in fee or hold under long term leases, in the regions named, extensive acreages of mineral and timber lands containing large quantities of ore yet unopened and substantial tracts of standing timber held for future use in mining operations.

OLYMPIC STEEL WORKS, 151 Horton St., Seattle, Wash.

Inc. Aug. 15, 1915 in Washington. Capital stock : com. \$50,000.

C. W. Kucher, P. ; Robert Welles, V. P. & T.

Works at 151 Horton St., Seattle : 2 Greene electric fur. (one 1-ton, one 2-ton) ; first steel made Nov. 5, 1915.

Product : electric steel castings for sale for machinery and general purposes ; chrome and vanadium alloy steel castings ; annual cap., 2,100 tons.

OMAHA STEEL WORKS, Omaha, Nebraska.

Inc. 1910 in Nebraska. Capital stock : com. auth. \$350,000, issued \$337,000 ; pref. 7% cum. \$150,000.

John W. Towle, P. ; R. A. Lanssler, V. P. ; William Carey, V. P. ; James M. Kelley, Sc. & A. ; K. E. Vogel, T. & G. M. ; R. L. Hyde, G. S. M. ; R. A. Long, P. A.

Works at 48th and Leavenworth Sts., Omaha : one 3-ton Ludlum electric fur. ; first steel castings Sept. 5, 1919 ; one cupola ; gray iron foundry. (Formerly Omaha Structural Steel Works ; name changed in spring of 1919).

Product : steel ingots and castings for own use and for sale, trailer and tractor castings, annual cap., 12,000 tons (6,000 tons ingots, 6,000 tons castings) ; gray iron castings, 600 tons ; semi-steel castings, 300 tons.

ONONDAGA STEEL CO., P. O. Box 24, Syracuse, N. Y.

Inc. May 15, 1916 in New York. Capital stock : com. auth.

\$500,000, issued \$93,000; pref. 7% cum. auth. \$500,000, issued \$94,900.

S. S. Buckley, P.; A. J. Briggs, V. P.; E. D. Newkirk, T.; C. H. Canfield, Sc.

Works at East Syracuse, N. Y.: blt. 1916-17, f. o. March, 1917; 1 electric fur. (1½-ton), f. o. April, 1918; two 8-pot crucible fur. f. o. Jan., 1919; eight brick heat fur. (1-d.); four soaking pits; 18" 2-h. 1-st. and 10" 3-h. 5-st. bar mill, f. o. May, 1917; 3 box annealing fur.; 4 ham. (100-lb. to 3,000-lb.).

Product: high speed steel ingots for own use; annual cap., 800 tons (600 tons electric, 200 tons crucible); high speed tool steel bars, 1,000 tons.

Company formerly operated plant in leased quarters at 1119 East Water St., Syracuse. Lease given up and equipment removed to new plant at East Syracuse.

ONTARIO ELECTRIC STEEL CO., Poughkeepsie, New York.

Inc. Jan. 22, 1919 in New York. Capital stock: com. \$500,000; pref. 8% cum. \$600,000.

Company is controlled by Century Steel Co. of America.

F. B. Lown, P. & S. M.; E. E. Perkins, 1 V. P.; Charles B. Laister, 2 V. P. & G. M.; Deyo S. Freer, A. Sc. & A. T.; William S. Rennie, S.; Joseph Meyer, P. A.; at Poughkeepsie. Earnest E. Smith, Sc. & T.; at 52 Devonshire St., Boston, Mass.

Sales offices:

Atlanta, C. J. Kinsey, 34 So. Forsythe St.

Boston, Aborn Steel Co., 171 High St.

Buffalo, Aborn Steel Co., 520 Marine Bank Bldg.

Chicago, General Steel Co., Washington Blvd & Green St.

Detroit, George H. Marvin & Sons, 60 Cadillac Sq.

New York, Aborn Steel Co., 22 Clarke St.

Philadelphia, Aborn Steel Co., 269 Drexel Bldg.

Rochester, N. Y., Aborn Steel Co., 133 Andrews St.

Springfield, Mass., Charles C. Lewis Co., 32 Lyman St.

Works at Fulton, N. Y.: one 1½-ton Heroult electric fur.; one 6-ton Heroult electric fur. being installed; 14" 3-h. 5-st. guide mill; 10 rehear. fur. (two 1-d., one 2-d., six 3-d., one 4-d. coal-fired); 2 annealing fur.; 5 steam ham. (600-lb. to 4-ton). (Formerly owned by Fulton Steel Corp.; acquired by Ontario Electric Steel Co., Jan. 22, 1919).

Product: electric steel ingots; manganese, tungsten, chrome, vanadium, nickel alloy and high speed steels. Annual cap., 7,500 tons electric steel ingots, 5,000 tons rolled products.

OPSAL STEEL CO., Ltd., Dufferin & Quebec Sts., Vancouver, B. C., Canada.

Works at Dufferin & Quebec Sts., Vancouver: one 2-ton electric fur.; machine shop.

Product: electric steel castings for own use and for sale; annual cap., 1,200 tons; logging equipment, stump pullers, loading booms and mining machinery.

Oregon Iron & Steel Co., Portland, Ore., see 1916 Directory, p. 243. Oswego Furnace sold to Pacific Coast Steel Co., June 22, 1917.

Oriskany Ore and Iron Corp., Covington, Va., see 1916 Directory, p. 243, was acquired by Lavino Furnace Co., in February, 1918.

Osage Iron & Steel Co., Sand Springs, Oklahoma, see 1916 Directory, p. 243. Was sold to G. W. Armstrong & Co., Fort Worth, Texas in Jan., 1916.

OTIS ELEVATOR CO., 11th Ave. & 26th St., New York, N. Y.

Inc. Nov. 28, 1898 in New Jersey. Capital stock: com. auth. \$10,000,000, issued \$8,108,087; pref. 6% non-cum. \$6,500,000; bonds \$1,377,000.

F. C. Furlow, P.; A. G. Mills, V. P.; J. C. Knapp, V. P.; T. M. Logan, Sc.; R. H. Pepper, T.; C. K. Kirkbride, A.; G. E. Heilman, P. A.; at New York. G. R. Rebmann, V. P.; at 16th & Sansom Sts., Philadelphia. C. G. Comstock, V. P.; at 1373 East 6th St., Cleveland, Ohio.

Sales offices in all principal cities.

Product: elevators, hoisting machinery, electric motors and controllers, high speed elevator machinery.

The company operates works at Harrison, N. J., Quincy, Ill., Yonkers, N. Y., and Buffalo, N. Y. Connected with the Buffalo Works is the steel foundry described below.

Buffalo Works, Northland Ave. & Grider St., Buffalo, N. Y.: 2 Snyder electric fur. 3-ton; electric steel first made Mar. 16, 1914. Gray iron, semi-steel, bronze and brass foundry.

Product: steel castings for own use; annual cap., 2,200 tons.

OTIS STEEL CO. (The), Cleveland, Ohio.

Est. 1873, inc. Oct. 1, 1919 in Ohio. Capital stock: com. auth. 500,000 shares no par value, issued 411,668 shares; pref. 7% cum. auth. \$15,000,000, issued \$4,830,600.

William G. Mather, Ch.; George Bartol, P. & T.; H. F. Deverell, V. P.; D. T. Croxton, V. P.; H. B. Miller, Sc.; G. A. Paine, A. Sc. & A. T.; P. F. Wilson, A. P. & G. M.; D. W. Glanzer, G. S. A.; L. C. Parrott, P. A.

Sales offices:

Chicago, W. H. Meyst Co., W. A. Roome.

Detroit, George W. House.

Milwaukee, George Gibbs.

New York, E. A. Steif.

St. Paul, H. G. Thompson.

Cleveland Furnaces, Cleveland: 2 stacks; No. 1, 87' x 22' 6", blt 1902-3; f. o. Aug. 21, 1903; rebld. 1919; No. 2, 90' x 21' 4", blt.

1907-08; f. o. Sept. 18, 1909; rebld. 1918; 8 Kennedy 2-pass stoves (90' x 22'); 7 steam blowing eng. (150,000 cfm.); 23 water-tube boilers, 7,900 H. P., serving coke oven dept. also; 2 Uehling double-strand pig casting machines. By-product coke: Lake ore. By-product coke plant: 100 Semet-Solvay by-product coke ovens, annual cap., 385,000 net tons coke. (Formerly owned by Cleveland Furnace Co.; acquired by The Otis Steel Co., Oct. 1, 1919.)

Product: basic, foundry and malleable pig iron; annual cap., 350,000 tons.

Lakeside Works, 3131 Lakeside Ave., Cleveland: blt. 1873-74, f. o. 1874; 3 A. O. H. fur. (one 15-ton, two 20-ton); 5 B. O. H. fur. (30-ton); one 2-ton Tropenas converter; 30" 2-h. 1-st. blooming mill; 42" x 152" 3-h. 1-st. and 31" x 112" 3-h. 1-st. sheared plate mills; 6 heat. fur. (five 4-d., one 5-d.); 11 gas producers. Fuel, nat. gas., prod. gas, fuel oil and coal. Product and annual cap.: 98,000 tons basic, 5,000 tons acid, open hearth ingots; 500 tons basic, 28,000 tons acid, open hearth castings; 225 tons converter castings; nickel and chrome alloy steel castings; gray iron castings for own use, 200 tons; 76,000 tons ship, tank, boiler, bridge, still bottom and fire box plates.

Riverside Works, 3341 Jennings Rd., Cleveland: blt. 1913-14, f. o. Sept., 1914; 30" x 84" 3-h. 2-st. sheared plate mill; four 3-h. 1-st. jobbing plate mills, (one 30" x 62"-72", one 30" x 44"-54", two 30" x 38"-44"); 12 heat. fur. (ten 4-d., two cont.); 3 sheet fur. (two 1-d., one 2-d.) 10 gas prod.; 2 cold mills (30" x 54", 30" x 72"); 1 box annealing fur., 3 Costello fur.; 4 pickling mach., 8 pickling tanks; patent leveller; 2 circle, 6 straight shears. Fuel, nat. gas, prod. gas and coal. Product and annual cap.: 172,000 tons ship, tank, boiler, bridge and still bottom plates; 78,000 tons light plates, blue annealed and black sheets to No. 24 gage; galvanizing, stamping and enameling sheets.

Sheet Mill Plant: building in 1920; eight 30" sheet mills; 8 cont. heat. fur., 8 sheet fur.; 7 box annealing fur.; 5 shears; 2 pickling mach.; 3 galv. pots. Product: black and galvanized sheets, annual cap., 60,000 tons.

PACIFIC ALLOY & STEEL CO., Bay Point, Cal.

F. B. Nims, P.; J. M. Kroyer, V. P.; Percy S. Webster, Sc. & T. Works at Bay Point, Cal.: blt. 1917, f. o. Jan., 1918; electric furnaces for manufacture of ferro-alloys. (Formerly owned by Pacific Electro Metals Co.; acquired by Pacific Alloy & Steel Co., Aug. 1, 1919).

Product: ferro-manganese, silico-manganese, ferro-chrome and other ferro alloys, annual cap., 3,000 tons.

PACIFIC BRASS & STEEL FOUNDRY, East 7th & Salmon Sts., Portland, Ore.

A. Popick, P.; H. Montgomery, T.; E. Montgomery, Sc.; R. P. Hanson, S. M.

Steel Foundry, East 7th & Salmon Sts., Portland: crucible steel fur. (36 pots total) blt. 1919, f. o. Oct. 1, 1919.

Product: crucible steel castings, annual cap., 250 tons.

Brass and aluminum foundry, East 6th & Main Sts., Portland, annual cap., 250 tons.

PACIFIC CAR & FOUNDRY CO., 214 Alaska Bldg., Seattle, Wash.

Inc. July 1, 1917 in Washington.

William Pigott, P.; John Twohy, V. P.; O. D. Colvin, V. P. & G. S. M.; J. E. McInerny, Sc. & T.; John Purse, A.; at Seattle. H. N. Curd, G. M.; E. T. Fehnel, P. A.; at Renton, Wash.

Works at Renton, Wash.: one 1-ton Greene electric fur., f. o. April, 1918; 2 cupolas. Gray iron foundry.

Product: electric steel castings for own use and for sale; annual cap., 1,000 tons; gray iron castings, 1,800 tons.

PACIFIC COAST STEEL CO., Rialto Bldg., San Francisco, Cal.

Inc. May 13, 1909 in California. Capital stock: com. auth. \$500,000, issued \$434,600; pref. 6% cum. auth. \$500,000, issued \$434,600; bonds \$850,000.

E. M. Wilson, P. & T.; D. E. McLaughlin, V. P.; C. P. Burgess, C.; E. S. Houdlette, G. M. Southern Division; C. O. Nelson, P. A.; at San Francisco. William Pigott, V. P.; W. S. Burt, Sc.; T. S. Clingan, Manager Northern District; L. G. Knight, P. A.; at Alaska Bldg., Seattle, Wash.

Sales offices:

Los Angeles, E. C. Chamberlain, Union Oil Bldg.

Portland, W. J. Maguire, Northwestern Bank Bldg.

San Francisco, C. A. G. Weymouth, S. M.; E. L. Whitney, Export S. M.; A. J. Gray, Reinforcing S. M.; Rialto Bldg.

Seattle, P. W. Cotton, S. M., Alaska Bldg.

Shanghai, China, E. R. Morrison.

The company owns plants at South San Francisco and 16th Street, San Francisco, Cal.; Linnton and Oswego, Ore.; Seattle, (Youngstown), Wash.

Total annual cap.: 260,000 tons ingots, 20,000 tons muck and scrap bar, 235,000 tons rolled products.

South San Francisco Works, South San Francisco, Cal.: blt. 1910-11, f. o. Jan. 2, 1912; 6 B. O. H. fur. (four 40-ton, two 30-ton); 2 cont. ingot heat. fur.; 2 cont. billet heat. fur.; 22" 3-h. 1-st.; 18" 3-h. 3-st.; 10" 3-h. 4-st. and 10" 2-h. 1-st.; 12" 3-h. 1-st. Belgian roughing, 9" 3-h. 4-st. and 9" 2-h. 1-st. finishing. Fuel, oil. Machine shop for own use. Product: steel ingots, bars, angles, channels, and tees; annual cap., 125,000 tons ingots, 110,000 tons rolled products.

16th Street Works, San Francisco: blt. 1913, f. o. Oct., 1914; one 40-ton B. O. H. furnace. Fuel, oil. (Formerly owned by West Coast Iron Co.; acquired by Pacific Coast Steel Co., Dec., 1918.) Product: steel ingots, annual cap., 20,000 tons.

Seattle Works, Youngstown, Wash.: blt. 1904-05, f. o. May 6, 1905; four 40-ton B. O. H. fur., first steel made Sept. 30, 1915; 4 double puddling fur.; 1 rotary squeezer; 7 heat. fur. (four 4-d. reverb., 3 cont. (2 ingot and 1 billet); 32" 3-h. 4-st. billet, bar and structural, 16" 3-h. 2-st. and 16" 2-h. 1-st.; 12" 3-h. 4-st. and 12" 2-h. 1-st.; 9" 3-h. 4-st. and 9" 2-h. 1-st. merchant mills. Fuel, oil. Product: ingots, muck bar and scrap bar, bar iron and steel; flats, rounds, squares; light rails, 8-lb. to 20-lb.; structural shapes. Annual cap.; 90,000 tons ingots, 20,000 tons muck and scrap bar, 100,000 tons blooms and billets, 125,000 tons merchant bars and structural shapes.

Portland Works, Linnton, Ore.: construction begun Nov., 1918; one 40-ton B. O. H. fur., annual cap., 25,000 tons.

Portland Works, Portland, Ore., formerly owned by Pacific Hardware & Steel Co., dismantled in 1917.

Oswego Furnace, Oswego, Ore.: 1 stack, blt. 1888, f. o. Oct. 1888; 3 Whitwell stoves. (Formerly owned by Oregon Iron & Steel Co.; acquired by Pacific Coast Steel Co., June 22, 1917). Annual cap., 15,000 tons. Idle since 1894.

Irondale Furnace, Irondale, Wash., dismantled in 1919.

Pacific Electro Metals Co., San Francisco, Cal., built electric furnace plant for manufacture of ferro-alloys at Bay Point, Cal. in 1917; plant acquired by Pacific Alloy & Steel Co., Aug. 1, 1919.

Pacific Steel Co., Ltd., see Pacific Steel Products Co.

Pacific Steel Products Co., Eburne, B. C., Canada, built a plant at Eburne in 1916 which was destroyed by fire in Sept., 1916 and rebuilt in 1916-17. Company was reincorporated in Nov., 1916 as Pacific Steel Co., Ltd. Pacific Steel Co., Ltd., was merged with the Eburne Steel Co., Ltd., in the latter part of 1918. Eburne

Steel Co., Ltd., made an assignment for the benefit of its creditors, Jan. 4, 1919, T. M. Taylor, Kerrisdale, B. C., assignee. Acquired by Vancouver Rolling Mills Co., Ltd. in 1919.

PAGE STEEL & WIRE CO., 644 Union Arcade, Pittsburgh, Pa.

Org. 1883; inc. Dec. 11, 1901 in New Jersey. Capital stock: com. \$1,000,000; 1st pref. 6% non-cum. auth. \$1,200,000, outstanding \$786,000; 2nd pref. 7% non-cum. auth. \$1,000,000, outstanding \$730,000; bonds \$394,000. Formerly known as Page Woven Wire Fence Co.; name changed to Page Steel & Wire Co., Oct. 22, 1917. Walter B. Lashar, P.; Wilmot F. Wheeler, T.; William M. Wheeler, Sc.; at Bridgeport, Conn. William T. Morris, V. P.; at New York. E. C. Sattley, G. M.; John K. Boll, G. S. M.; C. N. Johns, Sales Engineer; at Pittsburgh. John E. Carr, A. T.; Thomas J. Collins, A.; F. S. Ougheltree, G. S.; Robert Darnton, G. S. M.; C. A. Bovee, P. A.; at Adrian, Mich. George A. Paff, G. S.; J. M. Schumm, P. A.; at Monessen, Pa.

Sales offices:

Adrian, Mich., Robert Darnton, G. S. M.

Chicago, M. G. J. Hoffman and W. H. Bleecker, 29 South La Salle St.

Detroit, W. C. Clark, 1147 Book Bldg.

Pittsburgh, 644 Union Arcade Bldg.

New York, W. T. Kyle, S. M., 30 Church St.

Plants at Monessen, Pa., and Adrian, Mich.: Monessen plant produces steel and wire products; Adrian plant produces wrought iron fence, ornamental iron work, wire-link and fabric fences for enclosures, partitions, etc.

Monessen Plant, Monessen, Pa.: blt. 1899-1900, first steel made, May 31, 1900; first rods rolled June 18, 1900; 2 B. O. H. fur. (60-ton); two 2-d. Morgan reheat. fur.; 24" 3-h. 1-st. blooming; semi-cont. rod mill with 14" 2-h. 4-st. cont. billet, 12" 2-h. 5-st. and 10" 2-h. 5-st. cont., 8" 2-h. 4-st. looping; one 1,500-lb. steam ham.; 3 pickling rings for wire; 350 wire drawing blocks for wire $\frac{3}{8}$ " to 28 gage; 12 barb wire mach.; 79 wire fence mach.; 3 galv. pans. Fuel, bit. coal, natural and producer gas.

Product: steel ingots, wire rods, plain and galvanized wire, barbed wire, woven wire fence, rope wire, spring wire, American Ingot Iron wire, and "Copperweld" copper clad steel wire; annual cap., 60,000 tons ingots, 60,000 tons wire rods, 60,000 net tons wire products, 10,000 tons rope and spring wire.

Page Woven Wire Fence Co., see 1916 Directory, p. 247; name changed to Page Steel & Wire Co., Oct. 22, 1917.

PANAMA CANAL (The), Balboa Heights, Canal Zone, Panama.

Col. Chester Harding, Governor; H. A. A. Smith, A.; at Balboa Heights. A. L. Flint, P. A.; at Washington, D. C.

Works at Balboa, Canal Zone: one 2-ton Tropenas converter blt. 1911-12 at Gorgona, completed and f. o. Jan. 31, 1912, transferred to Balboa Aug. 1, 1913; one 500-ton steam hydraulic forging press; 10 steam ham. up to 2,700-lb.; 4 bull-dozers, bending slabs, shears, forging and tempering fur. Gray iron and brass foundry. Ajax reclaiming rolls for rolling bars from scrap.

Product: steel castings, gray iron and brass castings for own use and for sale; annual cap., steel castings 3,600 tons, gray iron 10,000 tons, brass and bronze 250 tons; rolled bars from scrap.

PARDEE WORKS (The C.), Inc., Perth Amboy, N. J.

Inc. Jan. 8, 1895 in New Jersey. Capital stock: com. \$1,000,000. Ario Pardee, P.; Charles H. Edwards, V. P. & G. M.; Charles F. Eilert, Sc. & T.

Works at Perth Amboy, N. J.: blt. 1900; f. o. Dec. 1, 1900; 4 B. O. H. fur. (two 30-ton, two 50-ton); 4 heat. fur. (three 4-d., one cont.); 10 single hole soaking pits; 34" 2-h. 1-st. reversing blooming; 20" 3-h. 1-st. billet; 14" 3-h. 1-st. roughing; 12" 3-h. 5-st. and 9" 3-h. 5-st. finishing mills. Fuel, bit. coal in rolling mill, prod. gas in O. H. fur. Two shafting plants, producing turned and polished, also cold drawn shafting and finished shapes in squares, hexagons and flats.

Product: steel ingots; blooms, billets and slabs; merchant bars; annual cap., 50,000 tons ingots, 45,000 tons blooms and billets, 35,000 tons merchant bars.

PARKERSBURG IRON & STEEL CO., Parkersburg, W. Va.

Inc. 1901 in West Virginia. Capital stock: com. auth. \$500,000, issued \$400,000.

C. F. Niemann, P. & T.; A. E. Niemann, 1 V. P.; N. S. Snyder, 2 V. P.; J. H. Gray, Sc.; at Pittsburgh, Pa. J. H. Randolph, A.; W. L. Danks, G. S.; E. J. Hayman, G. S. M. & P. A.; V. T. Renner, A. M. S.; at Parkersburg.

Sales offices: New York, Fuller Bros. & Co., 139 Greenwich St.; Pittsburgh, Pa., Citizens Savings Bank Bldg.

Brands: "Parkersburg" and "Acme."

Works at Parkersburg, W. Va.: blt. 1901, f. o. Dec., 1901; four 3-d. billet heat. fur.; 22" 3-h. billet and sheet bar mill, with 1-st. of bull-heads; 12 pair and sheet gas heat. fur.; nine 26" black sheet mills, 3 roughing, 6 finishing (two 32", three 36", one 42"); five 26" single-stand cold mills; 8 box annealing fur.; 1 plunger pickling mach., 1 hand pickling tank; 2 galvanizing pots. Sheet metal factory and roofing department.

Product: black, uniform blue and galvanized steel sheets, special iron sheets, 16 to 30 gage, annual cap., 25,000 tons. Stove pipe, elbows, pans and other sheet metal products; corrugated and other stamped roofings, sidings, etc.

PARKESBURG IRON CO., Parkesburg, Pa.

Inc. Jan. 16, 1882 in Pennsylvania. Capital stock: com. auth. \$250,000, issued \$244,600.

Horace A. Beale, Jr., P.; E. H. Brodhead, 1 V. P. & G. M.; George Thomas, 3rd, 2 V. P., T. & G. S. M.; H. B. Wiese, Sc.; Harold Sudell, A.; J. R. Humpton, S.; J. H. Cooper, S.; C. L. Frankhauser, P. A.

Sales offices:

Boston, G. W. Denyven, 141 Milk St.

Chicago, L. P. Mercer, 1616 Fisher Bldg.

New Orleans, Woodward, Wight & Co., Ltd.

New York, R. J. Sheridan, 30 Church St.

Norfolk, Eagleston-Parke, Inc.

Philadelphia, W. H. S. Bateman, 822 Commercial Trust Bldg.

St. Louis, J. G. Miller.

St. Paul, Paul J. Kalman & Co.

San Francisco, J. A. Kinkead.

Parkesburg Iron Works, Parkesburg, Pa.: fifteen 1-d heat. fur., coal-fired; two 20" 3-h. 1-st. muck mills; four 2-h. sheared plate mills (one 23" x 60", three 23" x 56").

Product: iron boiler tube skelp, annual cap., 22,000 tons.

Charcoal Forge: 26 charcoal refinery fires, 3 steam ham. (3 ton). Steam power. Product: charcoal blooms from scrap for own use, annual cap., 22,000 tons.

Tube mill: added 1908, f. o. Nov. 9, 1908: one gas-fired skelp-bending fur.; 3 lap-weld fur.; 7 gas prod. Product: charcoal iron boiler tubes, 2" to 4", annual cap., 15,000 tons.

Spring City Dpt., Spring City, Pa.: Charcoal forge, blt. 1884, rebt. 1907; 8 charcoal refinery fires; 2 ham. (one 3,000-lb., one 3-ton).

Fuel, charcoal: steam power. (Formerly operated by Spring City Bloom Works; acquired by Parkesburg Iron Co., Dec. 11, 1916.)

Product: charcoal blooms from scrap for own use and for sale, annual cap., 7,000 tons.

PARRY SOUND IRON CO., Ltd., Parry Sound, Ontario, Canada.

Inc. Aug. 15, 1918 in Ontario.

Col. J. A. Currie, P.; F. H. Kilbourn, Sc.; C. G. Neeve, T.

Brand: "Waubic."

Parry Sound Furnace, Parry Sound: 1 stack, 60' x 12', blt. 1912-13, f. o. Aug. 22, 1913, remod. 1918; 2 Durham stoves, 30' x 26'; one turbo blower (12,000 cfm.); 3 tubular boilers, 200 H. P. Conn. coke: Lake ore. (Formerly owned by Standard Iron Co., Ltd., acquired by Parry Sound Iron Co., August, 1918.)

Product: foundry pig iron; annual cap., 30,000 tons.

PARSONS CO. (The), Newton, Iowa.

Inc. 1906 in Iowa. Capital stock: com. \$200,000.

W. C. Bergman, P.; F. H. Bergman, V. P.; H. C. McCardell,

Sc. & G. M.; O. F. Ecklund, T.; E. H. Geise, A.; M. S. Vincent, G. S.; J. E. DeMuth, G. S. M.; H. J. Lammers, P. A.

Works at Newton: blt. 1909, f. o. Aug. 18, 1909; one 1-ton Rennerfelt electric fur.; 5 crucible steel fur. abandoned July, 1916. Machine shop for jobbing and own use.

Product: trench excavating machinery; steel castings for own use and for sale, annual cap., 3,000 tons.

PECK ROLLING MILLS, Ltd., 602 Eastern Townships Bank Bldg., Montreal, P. Q., Canada.

Inc. Jan. 1, 1903 in Dominion of Canada. Capital stock: com. \$579,000.

T. Esmond Peck, P. & M. D.; J. B. Peck, V. P.; E. J. Fry, Sc. & T.; C. B. Lang, M.

Works on Lachine Canal: est. 1831; heat. fur., roll trains, cut and wire nail mach., tack mach., horseshoe mach., railway spike and ship spike mach., etc. Fuel, coal and oil.

Product: bar iron and bar steel, concrete bars, shovel plate, railway spikes, ship spikes, cut nails, wire nails, tacks, iron and steel horse-shoes, washers, etc.

PEERLESS DRAWN STEEL CO. (The), Massillon, Ohio.

Inc. Sept., 1913 in Ohio. Capital stock: com. auth. \$2,000,000, issued \$300,000; pref. 8% cum. auth. \$1,000,000, issued \$600,000.

Fred H. Snyder, P.; E. H. Birney, V. P., T., G. M., G. S. M. & P. A.; E. A. Griffiths, Sc.

Sales offices:

Chicago, F. H. Johnson, 208 South La Salle Street.

Cincinnati, R. V. Mann, 1019 First National Bank Bldg.

Cleveland, J. T. Au Werter, 811 Citizens Bldg.

Detroit, L. H. Carlisle, 1938 Penobscot Bldg.

New York, J. E. Vincent, Liberty Tower Bldg.

Rochester, N. Y., E. E. Guntert, 510 Cutler Bldg.

San Francisco, A. W. Dow, Call Bldg.

Works at Massillon, Ohio: building rolling mill; two 4-d. heat. fur.; 14" 3-h. 1-st. roughing, 10" 3-h. 2-st. and 10" 2-h. 1-st. finishing; to be completed in July, 1920, annual cap., 33,000 tons merchant bars. Cold drawing plant.

Product: cold drawn steel products, rounds, flats, hexagons, squares, screw stock, special shapes, alloy steels.

PELTON STEEL CO., 672 Kinnickinnic Ave., Milwaukee, Wis.

Inc. Mar. 1, 1916 in Wisconsin. Capital stock: com. \$100,000.

G. A. Reuss, P. & T.; Wm. H. Schuchardt, V. P., Sc. & G. M.;

S. C. Johnson, Works M.; M. R. Fleischer, A. M. & P. A.; C. H. Olroge, G. S. M.

Former works at Chicago Ave. & Elliott Pl. abandoned; equipment removed to new works on Kinnickinnic Ave., operation begun May 1, 1919.

Works at 672 Kinnickinnic Ave., Milwaukee: one 10-ton A. O. H. fur.; two 1½-ton Snyder electric fur.

Product: steel castings for sale, annual cap., 6,000 tons open hearth, 4,000 tons electric steel castings.

PENN ELECTRIC SMELTING CORPORATION, 165 Broadway, New York, N. Y.

Inc. Sept. 27, 1918 in New York.

Clements Batcheller, P.; David P. Earle, T.; G. F. Stringer, G. S. M.; E. E. Kirkland, P. A.; at 165 Broadway, New York. Edwin Corning, V. P.; Hiland G. Batcheller, V. P.; at Watervliet, N. Y. Ellis O. Friedman, Sc.; at 82 State St., Albany, N. Y. H. M. Shimer, G. S.; at Philadelphia, Pa.

Sales offices: Albany, E. O. Friedman, 82 State St.; Chicago, G. B. Hastings, 14 E. Jackson Blvd.; Montreal, A. C. Leslie & Co., Ltd.

Works at 19th St. & Washington Ave., Philadelphia: 4 special electric fur., f. o. 1916. Electric power from Philadelphia Electric Co.

Product: ferro-chrome, ferro-tungsten and ferro-vanadium; annual cap., 450 tons ferro-alloys.

PENN IRON & COAL CO. (The), 1300 Leader-News Bldg., Cleveland, Ohio.

Inc. Sept. 27, 1881 in Ohio. Capital stock: com. \$1,000,000.

F. B. Richards, P.; L. C. Hanna, Jr., 1 V. P.; C. N. Osborne, 2 V. P. & T.; L. R. Close, A.; P. J. Moran, G. M.; C. K. Sheridan, P. A.; at Cleveland. H. S. Ream, Sc.; E. Bowman, G. S.; at Dover, Ohio.

Sales agents: M. A. Hanna & Co., Cleveland, Ohio.

Dover Furnace, Dover, Ohio: 1 stack, 85' x 20' 6", blt. 1854, remod. 1917; 5 stoves (3 Cowper-Roberts, 70' x 18'; one Foote, 75' x 19'; one McKee, 90' x 22'); 3 steam blowing eng. (65,000 cfm.); 14 water-tube boilers, 3,100 H. P.; one Pittsburgh Coal Washer single-strand casting machine. By-product and Conn. coke: Lake ore.

Product: bessemer, basic and malleable pig iron, annual cap., 146,000 tons.

PENN IRON & STEEL CO., Creighton, Pa.

Inc. May 22, 1916 in Pennsylvania. Capital stock: com. \$150,000.

G. T. Lewis, P. & G. M.; C. J. Nieman, Sc. & T.; at Creighton. Lewis W. Hicks, 1 V. P.; at Pittsburgh. S. N. Hicks, 2 V. P.; at Denver, Col.

Works at Creighton: blt. 1916-17, f. o. 1917; 19 single puddling fur.; 1 rotary squeezer; three 3-d. heat. fur.; 20" 3-h. 2-st. muck mill; 18" 3-h. 3-st. bar mill; 14" and 10" 3-h. 5-st. guide mill. Fuel, coal.

Product: low-phosphorus melting bar, refined iron, special staybolt and engine bolt iron, U. S. Navy chain iron. Annual cap., 10,000 tons muck bar, 12,000 tons finished rolled products.

Penn Iron Co., Ltd., Lancaster, Pa., see 1916 Directory, p. 251; reorganized as Penn Steel & Iron Corporation, Feb. 13, 1917.

Penn Marine & Ordnance Castings Co., Inc., see 1916 Directory, p. 251; name changed to Penn Seaboard Steel Corporation, June, 1916.

PENN SEABOARD STEEL CORPORATION, 1417 Sansom St., Philadelphia, Pa.

Inc. Dec., 1915 in New York. Capital stock: 200,000 shares, no par value. Formerly Penn Marine & Ordnance Castings Co., Inc.; name changed to Penn Seaboard Steel Corporation, June, 1916.

J. B. Warren, P.; George Satterthwaite, V. P.; C. F. Jemison, Sc. & T.; H. W. Fielden, A.; G. A. Pedrick, P. A.

Sales offices: Boston, 703 Oliver Bldg.; Chicago, 1618 Marquette Bldg.; Cleveland, 804 Swetland Bldg.; New York, 2 Rector St.; Philadelphia, 1417 Sansom St.

Penn Works, Chester, Pa.: blt. 1892, f. o. Sept. 25, 1892; 5 A. O. H. fur. (three 25-ton, one 8-ton, one 5-ton). Gray iron foundry for own use (annual cap., 750 tons). (Formerly owned by Penn Steel Castings and Machine Co.; acquired by Penn Seaboard Steel Corporation, Feb. 1, 1916). Product: open hearth steel castings for sale; annual cap., 62,000 tons.

Baldt Works, New Castle, Del.: blt. 1903-04, f. o. Apr. 22, 1905; 6 B. O. H. fur. (30-ton); 3 soaking pits (two 2-hole, one 4-hole) oil fuel; one 30" x 84" 2-h. sheared plate mill. (Formerly owned by Baldt Steel Co.; acquired by Penn Seaboard Steel Corporation, Feb. 1, 1916). Product: steel ingots, nickel and vanadium alloy steel ingots, annual cap., 100,000 tons; ship, tank, boiler, flanging and special alloy plates, annual cap., 64,000 tons.

New Haven Works, New Haven, Conn.: blt. 1903; 3 B. O. H. fur. (30-ton); 1 A. O. H. fur. (30-ton). (Formerly owned by Safety Insulated Wire & Cable Co.; acquired by Penn Seaboard Steel Corporation, Oct. 11, 1916). Product: steel ingots for sale, annual cap., 40,000 tons (25,000 tons basic, 15,000 tons acid).

PENN STEEL & IRON CORPORATION, 241 North Plum St., Lancaster, Pa.

Inc. Feb., 1917 in New York. Capital stock: auth. \$5,000, issued \$4,210; pref. 7% cum. auth. \$150,000, issued \$102,500; bonds \$200,000.

H. M. Buck, P.; at 30 Church St., New York. J. F. Steinman, V. P. & T.; I. Z. Buckwalter, Sc.; at Lancaster.

Sales offices:

Boston, Mass., J. C. Barr, 84 State St.

New Orleans, La., J. O. Elmer Co., 223 South Peters St.

New York, H. M. Buck, 30 Church St.

Works at Lancaster, Pa.: f. o. April, 1873; 8 double puddling fur.; 1 rotary squeezer; six 3-d. heat. fur.; 18" 3-h. 2-st. muck; 16" 3-h. 3-st. bar; 10" 3-h. 6-st. tandem guide; 9" 3-h. 4-st. guide. Fuel,

bit. coal. (Formerly the Penn Iron Co., Ltd.; reorganized as Penn Steel & Iron Corp., Feb. 13, 1917.)

Product: muck and scrap bar; merchant bar iron, rounds, squares and flats; boat spikes, black and galvanized; annual cap., 12,000 tons muck and scrap bar, 20,000 tons merchant bars.

Penn Steel Castings & Machine Co., Front & Penn Sts., Chester, Pa., see 1916 Directory, p. 251, was acquired by the Penn Seaboard Steel Corporation, Feb. 1, 1916.

PENNSYLVANIA BRAKE BEAM CO., 943 East Market St., Danville, Pa.

Inc. May 11, 1904 in Pennsylvania. Capital stock: com. \$20,000. James W. Trenchard, P.; S. H. Hitchner, Sc.; at Bridgeton, N. J. E. M. Applebaugh, V. P., T., G. M., G. S. M. & P. A.; at Danville.

Works at Danville: 1 cont. coal-fired heat. fur.; 24" 3-h. 2-st. roll train. Fuel, coal. Machine shop, own use. (Formerly owned by T. J. Price, trustee; acquired by Pennsylvania Brake Beam Co., July 3, 1917.)

Product: special shapes for brake beams and commercial purposes, deck and I beams, channels, light rails; annual cap., 15,000 tons.

Pennsylvania Steel Co. of New Jersey, Philadelphia, Pa., see 1916 Directory, p. 252. Was purchased by the Bethlehem Steel Co., Bethlehem, Pa., March 1, 1916, including Pennsylvania Steel Co. of Pennsylvania, Maryland Steel Co., Spanish-American Iron Co., Penn-Mary Coal Co., and other properties. In May, 1917 Bethlehem Steel Co. sold the Lochiel Furnace to E. E. Marshall, Philadelphia, Pa.

PERRY IRON CO., 600 Western Reserve Bldg., Cleveland, Ohio.

Inc. July 12, 1906 in Pennsylvania. Capital stock: com. \$600,000, bonds, \$247,000.

William McLauchlan, P.; W. J. Gruss, V. P.; S. E. Boöl, Sc.; E. P. Williams, T.; H. S. Pickands, P. A.; at Cleveland. F. W. Coburn, G. S.; at Erie, Pa.

Sales agents: Pickands, Mather & Co., 600 Western Reserve Bldg., Cleveland.

Brand: "Perry."

Perry Furnace, Erie, Pa.: 1 stack, 75' x 18' 2", blt. 1906-07, f. o. June 16, 1907; 4 stoves (3 McClure, 70' x 21', one McKee, 70' x 22'); 2 steam blowing eng. (36,000 cfm.); 6 water-tube boilers, 2,400 H. P.; one single-strand Uehling casting mach. By-product and beehive coke: Lake ore.

Product: foundry, malleable and basic pig iron, annual cap., 109,500 tons.

PETTIBONE MULLIKEN CO., 725 Marquette Bldg., Chicago, Ill.
Inc. June 21, 1912 in New York. Capital stock: com. \$7,000,000;
pref. 7% cum. \$1,750,000.

Alfred H. Mulliken, P. & T.; C. H. Eib, V. P.; E. N. Strom, V. P.;
H. R. Prest, Sc.

Works at 48th Ave. & Division St., Chicago: blt. 1908, f. o. Feb.,
1909; one 2-ton Heroult electric fur. added 1918-19; f. o. Mar. 17,
1919; two 4-ton Schwartz steel fur. (abandoned).

Product: steel castings for sale and for own use; manganese steel
castings; frogs, guard rails, crossings, switches, switch stands, etc.
Annual cap., 4,285 tons electric steel castings, 35,000 tons frogs,
crossings, etc.

Philadelphia Steel and Forge Co., see 1916 Directory, p. 256. Name
changed to Tacony Steel Co., April 1, 1917.

Phillips Sheet & Tin Plate Co., Weirton, W. Va., see 1916 Directory,
p. 257; name changed to Weirton Steel Company, July 1, 1918.

PHOENIX HORSE SHOE CO., Rookery Bldg., Chicago, Ill.

Inc. 1892. Capital stock: com. auth. \$3,000,000; issued
\$2,063,000.

J. W. Kiser, P.; at 347 Madison Ave., New York. S. H. Roberts,
Sc. & T.; at Rookery Bldg., Chicago. Thomas F. Hotchkiss, V. P.,
G. M. & P. A.; at Joliet, Ill.

Sales offices: Chicago, A. W. Sersmith, 209 South La Salle St.; New
York, M. F. O'Connor, 347 Madison Ave.

Brands: "Phoenix," "Bull Dog."

The company operates two plants for the manufacture of horse
and mule shoes and toe calks. A rolling mill for manufacture of
horseshoe bars is connected with each of these works.

Joliet Works, Joliet, Ill.: blt. and f. o. 1893; 32 heat. fur. (25 coal-
fired, 7 oil-fired); 2 gas producers; 6 trains (four 9", one 10", one
20"). Product and annual cap.: 24,000 tons bars.

Poughkeepsie Works, Poughkeepsie, N. Y.: blt. 1873; 24 coal-fired
heat. fur.; 6 trains (four 9", two 18"); 2 gas producers. Product
and annual cap.: 20,000 tons bars.

PHOENIX IRON CO. (The), 22 South 15th St., Philadelphia, Pa.

Inc. April 27, 1855 in Pennsylvania. Capital stock: com. \$700,-
000; pref. 7% cum. \$800,000; bonds \$1,200,000.

David Reeves, P.; Samuel J. Reeves, V. P. & P. A.; George Gerry
White, Sc.; Geo. C. Carson, Jr., T.; A. H. Cordery, G. S. M.;
at Philadelphia. Wm. H. Reeves, V. P. & G. S.; Frank P. Norris,
G. M.; at Phoenixville, Pa.

Sales offices:

Boston, Mass., W. H. Allen, Jr., 110 State St.

New York, N. Y., D. W. Sisson, 49 William St.

Rochester, N. Y., S. G. Case, Chamber of Commerce Bldg.

Washington, D. C., W. E. Sturges, Jr., Munsey Bldg.

Phoenix Iron Works, Phoenixville, Pa.: est. 1790; Steel works; blt. 1888-89, f. o. Feb., 1889; 6 B. O. H. fur. (three 150-ton, three 200-ton); 5 soaking pits (one 3-hole, four 4-hole); 9 heat. fur. (one 3-d., four 4-d., three 6-d., one cont.); 36" 2-h. 1-st. reversing blooming mill; 5 structural mills (24" 3-h. 4-st., two 22" 3-h. 4-st., 13" 3-h. 4-st., 9" 3-h. 4-st.); 7 steam ham. Bridge works, eye-bar plant, foundry for steel and gray iron castings, bolt, nut and rivet works. The fabrication of all structural steel work is contracted for by Phoenix Bridge Co., Phoenixville, a subsidiary.

Product: steel ingots; bars, beams, channels, angles, tees, miscellaneous structural shapes; eye-bars, forged steel eye-bars, rounds, etc.; bolts, nuts and rivets for own use; gray iron and steel castings for own use and for sale; erect railroad and highway bridges, iron and steel buildings. Annual cap.; 226,000 tons ingots, 200,000 tons heavy and light structural shapes, 8,000 tons forged products, 6,000 tons gray iron and 2,500 tons steel castings, 75,000 tons fabricated structural work.

The company owns 1,330 acres of iron ore lands in Chester, Montgomery, Berks and Lancaster Counties, Pennsylvania. It also owns 15 acres limestone lands at Port Kennedy, Pa.

PINE IRON WORKS CO., Pine Forge, Pa.

Inc. 1902 in Pennsylvania. Capital stock: com. \$75,000.

James B. Bailey, P.; J. E. Dougherty, A. T.; J. A. Whitacre, G. S.; at Pine Forge. F. R. Smith, Sc. & T.; at Harrisburg, Pa.

Pine Iron Works, Pine Forge, Pa.: blt. 1881; two 3-d. heat. fur.; 26" x 84" 2-h. and 26" x 72" 3-h. plate mills; one 100" Morgan shear. Fuel, bit. coal. Product: iron and steel boiler, ship, tank and floor plates, annual cap., 20,000 tons.

Steel Works at Newberry, Williamsport, Pa. (leased from Sweet's Steel Co.): blt. 1903-04, f. o. July 27, 1904; 3 B. O. H. fur. (25-ton); 5 gas prod. Fuel, coal and prod. gas. Product: steel ingots, annual cap., 36,000 tons.

Lucknow Forge, Lucknow, Pa. (leased from John W. Reily): blt. 1883, f. o. Dec. 10, 1883; 10 forge fires; 1 heat. fur.; 1 run-out fire; 1 steam ham. Fuel, charcoal. Steam power. Product: charcoal blooms from scrap for own use and for sale; annual cap., 6,500 tons.

Pioneer Iron Co., Negaunee, Mich., see 1916 Directory, p. 259. Pioneer Furnace No. 2 at Marquette, Mich., was taken over by the Cleveland-Cliffs Iron Co., Dec. 31, 1916.

PITTSBURGH CRUCIBLE STEEL CO., Oliver Bldg., Pittsburgh, Pa.

Inc. Feb. 20, 1911. Subsidiary of Crucible Steel Co. of America.

Midland Works, Midland, Pa.:

Midland Furnaces: 2 stacks, No. 1, 85' x 22', blt. 1905-06, f. o.

Sept. 6, 1906, rebld. 1914; No. 2, 92' x 22' 6", construction begun June 2, 1918, to be completed about May 1, 1920; 5 McClure 3-pass stoves, 100' x 21', 3 two-pass stoves under construction; 4 steam blowing engines (75,000 cfm.); 14 boilers, 5,900 H. P.; 1 Uehling double-strand pig casting machine; slag granulating pit, annual cap., 90,000 tons. Coke: Lake ore. Product: basic pig iron, annual cap., No. 1, 162,250 tons, No. 2, 200,000 tons.

By-product coke plant: 100 Koppers by-product ovens, under construction, annual cap., 435,000 net tons coke.

Beehive coke plant: 240 beehive ovens, annual cap., 150,000 net tons, idle.

Steel works: blt. 1911-12, f. o. Aug. 4, 1913; 10 B. O. H. fur. (90-ton); 2 A. O. H. fur. (90-ton); 600-ton metal mixer; seven 4-hole soaking pits; cont. heat. fur.; 40" 2-h. 1-st. reversing blooming; 28" 3-h. 1-st. billet; 24" 2-h. 3-st. bar; 14" roughing and 12" to 8" finishing Morgan continuous bar mill. Steel foundry, steel castings for own use.

Product: ingots, alloy steel ingots, billets and merchant bars. Annual cap., 383,250 tons ingots (321,200 tons basic, 62,050 tons acid); 350,000 tons billets, slabs, and merchant bars.

PITTSBURGH FORGE & IRON CO., 1306 Chamber of Commerce Bldg., Pittsburgh, Pa.

Inc. 1867, reinc. 1919 in Pennsylvania. Capital stock: com. auth. \$300,000, issued \$300,000.

F. E. Richardson, P.; Ben. G. Wells, V. P.; W. I. Miller, Sc. & T.; James P. McLean, A.; John H. Baer, G. S.; Charles Clark, P. A.

Sales office: Chicago, R. A. Dugan, Railway Exchange Bldg.

Brands: "Atlas," "Atlas Special" for rolled products.

Works at North Side, Pittsburgh, Pa.: blt. 1864; 30 single puddling fur.; 1 squeezer; 6 heat. fur. (one 3-d., five 4-d.); 8 gas prod.; 20" 3-h. 2-st. muck; 16" 3-h. 3-st. bar; 9" 3-h. 5-st. guide; 8 steam ham. (500-lb. to 6-ton); one 500-ton forging press. Bolt and spike department. Fuel, prod. gas.

Product and annual cap.: muck and scrap bar (25,000 tons); merchant bars (11,000 tons), skelp, flue and pipe iron (3,000 tons), spike and bolt rods (6,000 tons); track bolts and screw spikes (2,000 kegs), heavy marine and machine forgings, railway car axles, driving axles, crank pins and piston rods (25,000 tons).

PITTSBURGH IRON & STEEL FOUNDRIES CO., Oliver Bldg., Pittsburgh, Pa.

Est. 1837; inc. Oct. 23, 1899 in Pennsylvania. Capital stock: com. \$600,000.

J. Ramsey Speer, Ch.; Charles McKnight, P. & T.; J. McK. Speer, 1 V. P.; C. F. Blue, Jr., 2 V. P. & G. S. A.; H. V. Blaxter, Sc.; E. C. B. Gould, A. G. S. A.; at Pittsburgh, B. F. Parlett, Jr., S.; S. J. Nock, A. & A. Sc.; J. J. O'Neill, P. A.; at Midland, Pa.

Sales office: 314 Oliver Bldg., Pittsburgh; district offices at Chicago and San Francisco.

Works at Midland, Pa.: blt. 1907; 2 A. O. H. fur. (one 20-ton, one 25-ton); first steel made June 27, 1912; 3 cupolas. Fuel, natural gas and oil.

Product: "Adamite" rolls and castings; iron and steel castings for sale for rolling mills, shipyard and railroad castings, etc.; annual cap., 8,500 tons steel castings, 50,000 tons iron castings.

PITTSBURGH METALLURGICAL CO., Inc., Niagara Falls, N. Y.

Inc. June, 1913 in Delaware. Capital stock: com. \$250,000.

A. F. Plock, P. & G. M.; Clark White, V. P.; Charles Nicholas, G. S.; Laurence Bright, G. S. M. & P. A.; at Niagara Falls. Kenneth Seaver, Sc. & T.; J. W. McVicker, A.; at Pittsburgh, Pa.

Sales agents: Eaton, Rhoades & Co., Oliver Bldg., Pittsburgh.

Works at Montour Junction, Coraopolis: ferro-alloys first made, 1917; one 1,800 K. W. electric furnace. Abandoned in 1919.

Product: 25% and 50% ferro-silicon, annual cap., 2,000 tons.

Company is building works at Niagara Falls, N. Y., with three electric fur. for the manufacture of ferro-silicon and ferro-chrome; to be completed in May, 1920; annual cap. to be about 2,000 tons ferro-chrome, 5,000 tons ferro-silicon.

PITTSBURGH RADIUM CO., 311 Park Building, Pittsburgh, Pa.

Inc. June 22, 1916 in Utah. Capital stock: com. auth. \$500,000, issued \$330,000.

W. J. Stevenson, P.; R. W. Russell, Sc.; Henry Fitzpatrick, T.; at 311 Park Bldg., Pittsburgh. Joel H. Fuller, V. P.; at Rockefeller Bldg., Cleveland, Ohio.

Works at Denver, Col.: 2 Wile electric fur., f. o. 1917; power from the Denver Gas & Electric Co. Old plant at Denver, Col., abandoned in 1919; new plant built at Denver in 1919.

Product: ferro-vanadium, ferro-uranium, ferro-tungsten, ferromolybdenum, ferro-manganese; annual cap., 1,250 tons.

PITTSBURGH ROLLS CORPORATION, 41st & Willow Sts., Pittsburgh, Pa.

Inc. July 24, 1917 in Virginia. Capital stock: com. auth. \$2,500,000, issued \$1,500,000; pref. 7% cum. auth. \$500,000, issued \$500,000; bonds \$1,000,000.

D. L. Eynon, P.; Q. S. Snyder, T.; P. M. Fleming, A.; Dan Lewis, G. S.; J. L. Boitano, P. A.

Sales agents: A. J. Ramsay, Otis Bldg., Chicago, Ill.; Drummond, McCall & Co., Montreal, Canada.

Phoenix Roll Works, 41st St. & A. V. R. R., Pittsburgh: one 20-ton A. O. H. fur., f. o. Aug., 1917; one 12-ton A. O. H. fur. added 1919; 3 cupolas; 5 air fur.; 7 annealing ovens.

Product: "Phoenix Metal" patent semi-steel, chill and sand rolls and pinions; steel rolls and pinions; annual cap., 25,000 tons.

PITTSBURGH SEAMLESS TUBE CO., Beaver Falls, Pa.

Inc. Aug. 15, 1901 in Pennsylvania. Capital stock: com. auth. \$5,000,000, issued \$1,200,000.

Edward H. Wells, P.; J. P. Sneddon, V. P.; E. E. McPherson, Sc.; F. J. Cluley, T. & P. A.; H. H. Murray, S.

Works at Morado Station: blt. 1899, f. o. Dec. 20, 1899; 2 billet heat. fur., 2 piercing mills, 2 trains (22" 2-h. 1-st.).

Product: cold drawn and hot finished seamless steel tubes; annual cap., 15,000 tons blanks for cold drawn, and 22,000,000 feet hot finished seamless tubes.

Pittsburgh Sheet & Tin Plate Co., acquired plant at Marietta, Ohio, formerly owned by Union Sheet & Tin Plate Co., from The Commonwealth Title Insurance & Trust Co., Philadelphia, in 1916; reorganized as Pittsburgh Tin Plate & Steel Corporation, Jan., 1919.

PITTSBURGH STEAMSHIP CO., Rockefeller Bldg., Cleveland, Ohio, and Wolvin Bldg., Duluth, Minn.

H. Coulby, P.; A. F. Harvey, V. P.; E. C. Collins, V. P.; H. A. Kelley, Sc.; A. L. Macgregor, A. A.; at Cleveland. J. H. McLean, V. P.; George D. Swift, T.; J. T. Melvin, A. T.; A. G. Caldwell, 2 A. T.; John L. Mullin, A.; W. J. O'Connor, A. A.; at Duluth. J. M. Sias, A. Sc.; at 71 Broadway, New York.

The Pittsburgh Steamship Co. owns or operates on the Great Lakes in the transportation of iron ore, coal and limestone for United States Steel Corporation interests 78 steamships, 21 barges and 2 supply boats.

PITTSBURGH STEEL CO., 700 Union Arcade Bldg., Pittsburgh, Pa.

Inc. July 1, 1901 in Pennsylvania. Capital stock: com. \$7,000,000; pref. 7% cum. \$10,500,000.

John Bindley, P.; Emil Winter, 1 V. P.; D. P. Bennett, 2 V. P. & T.; B. L. Cogshall, A. P.; C. E. Beeson, Sc.; Clayton Snyder, A. T.; W. K. Given, A.; J. G. Deericks, G. S. M.; Robert McMillan, P. A.; at Pittsburgh. M. E. Johnson, A. G. S. M.; at Equitable B'dg., New York. C. J. Mogan, G. S.; at Monessen.

Sales offices:

Chicago, George W. Jones, McCormick Bldg.

Dallas, H. B. Webster, Southwestern Life Bldg.

Memphis, E. W. Watson, Exchange Bldg.

New York, Chas. M. Porcher, Equitable Bldg.

San Francisco, A. C. Rulofson & Co., Monadnock Bldg.

Product: pig iron, billets, rounds for seamless tubes, hoops, bands and cotton ties; wire rods, bright, annealed and galvanized wire, barbed wire, wire fence, wire nails and staples.

Brand: "Pittsburgh Perfect."

The company owns and operates plants at Monessen and Glassport, Pa. It controls the following subsidiary companies:

Pittsburgh Perfect Fence Co., Ltd.

Pittsburgh Steel Ore Co., which owns the Rowe Mine on the Cuyuna Range.

Pittsburgh Steel Sales Co.

Standard Land & Improvement Co.

Monessen Coal & Coke Co.

Monessen Southwestern Railway Co.

Monessen Works, Monessen, Pa.; Monessen Furnaces; 2 stacks, 90' x 22' 6"; blt. 1912-13, f. o. Aug. 5 and Aug. 28, 1913, relined 1919; 8 McClure 3-pass stoves, 100' x 22'; 4 steam blowing eng. (50,000 cfm.); 14 water-tube boilers, 7,000 H. P.; 1 double-strand pig casting mach.; 2 Greenawalt sintering plants for flue dust, annual cap., 24,000 tons; 2 slag granulating pits, cap. 25 cars per day. Conn. coke: Lake ores. Product: basic pig iron; annual cap., 360,000 tons.

Open Hearth Dept.: 12 B. O. H. fur. (60-ton); metal mixer (600-ton); first steel made Aug. 3, 1908. Annual cap., 620,000 tons ingots.

Rolling Mill Dept.: orig. blt. 1901-02; 2 cont. billet heat. fur.; six 5-hole soaking pits; 46" 3-h. 1-st. blooming; 28" 3-h. 2-st. billet; 18" 2-h. 6-st. bar mill; Garrett rod mill; Morgan cont. rod mill; 15 pickling tubs; 485 wire drawing blocks for wire $1\frac{5}{32}$ " to 18 gage; 317 wire nail mach.; 131 barbed wire mach.; 46 wire fence mach.; 10 galvanizing pans. Product: blooms, billets and bars, wire rods, plain wire, galvanized wire, wire nails, barbed wire, wire fence; annual cap., 550,000 tons blooms, billets and bars; 300,000 tons wire rods; 335,000 net tons plain wire, 120,000 net tons gal. wire, 2,500,000 kegs (100-lb.) wire nails, 90,000 net tons barbed wire, 80,000 net tons wire fencing.

Glassport Works, Glassport, Pa.: blt. 1899-1900; f. o. March, 1900; 1 cont., 2 regen. gas heat. fur.; 2 trains (10" and 8" hoop and band mills); 1 hammer. Fuel, producer gas and bit. coal. Product: hoops, bands, cotton ties; annual cap., 36,000 tons.

The company owns and operates the Rowe Mine, and has substantial interest in Bennett Mining Co. and Mesaba Cliffs Iron Mining Co. It also owns and operates 400 rectangular coke ovens at Alicia, Pa., annual cap., 350,000 net tons coke.

PITTSBURGH STEEL FOUNDRY CO., 1209 House Bldg., Pittsburgh, Pa.

Inc. 1899 in Pennsylvania. Capital stock: com. \$1,500,000.

Stewart Johnston, P. & P. A.; J. M. Lockhart, 1 V. P.; E. R. Williams, 2 V. P. & G. S. M.; John Bright, Sc. & T.; at Pittsburgh. G. A. Hassel, G. S.; at Glassport, Pa.

Sales office: Philadelphia, H. V. Seth, 929 Real Estate Trust Bldg. Works at Glassport, Pa.: blt. 1899, first steel made Nov., 1899; 3 B. O. H. fur. (two 20-ton, one 25-ton); one A. O. H. fur. (20-ton). Fuel, nat. gas and oil. Machine shop for jobbing and own use.

Product: steel castings and steel ingots for sale; nickel, chrome and vanadium alloy steel castings; annual cap., 60,000 tons castings (46,000 basic, 14,000 acid); 3,000 tons ingots (2,000 tons basic, 1,000 tons acid).

PITTSBURGH STEEL PRODUCTS CO., Union Arcade Bldg., Pittsburgh, Pa.

Inc. Feb. 9, 1909 in Pennsylvania. Capital stock: com. \$2,000,000. Willis F. McCook, P.; Edward H. Bindley, V. P. & G. M.; Emil Winter, V. P.; W. C. Reitz, Sc. & T.; W. L. Rowe, A. Sc. & A. T.; John T. Johnson, A.; Richard R. Harris, G. S. M.; H. Llewellyn, P. A.; at Pittsburgh. M. Wickstrom, S. Monessen Works; at Monessen. W. C. Sutherland, S. Allenport Works; at Allenport. Sales offices: Chicago, C. F. Palmer, McCormick Bldg.; Detroit, C. R. Phillips, Dime Savings Bank Bldg.; New York, J. A. Voelker, Equitable Bldg.

Company operates two plants for the manufacture of seamless steel tubes, one at Monessen, Pa., the other at Allenport, Pa. These plants are equipped with six billet piercing mills and six rolling mills, supplementary benches and other machinery for finishing tubes; specialty department for forming special shapes.

Product: all sizes and gages of seamless steel tubing up to 6" dia., annual cap., 120,000 tons.

PITTSBURGH TIN PLATE & STEEL CORPORATION, 554 Union Arcade Bldg., Pittsburgh, Pa.

Inc. Jan. 21, 1919 in Delaware. Capital stock: com. auth. \$1,500,000, issued \$850,000; pref. 8% cum. auth. \$1,500,000, issued \$650,000.

Lakin C. Taylor, P.; John W. White, Sc.; C. E. Waters, T. & P. A.; C. E. Buchanan, A.; at Pittsburgh. E. Cooper Shapley, V. P.; at Philadelphia. J. H. Metzler, G. S.; at Marietta, Ohio.

Sales office: 170 Broadway, New York.

Sales representatives: Scott, Sugden & Lamont at Los Angeles, San Francisco, Seattle and Singapore.

Works at Marietta, Ohio: blt. 1902-03, f. o. April 15, 1903; 4 sheet and 4 pair fur.; 4 hot-black plate (tin) mills (26" x 28" to 28" x 44"); 4 stands cold mills; 4 box annealing fur.; 1 Mesta pickling mach.; 1 hand pickling tank; 10 tinning sets (8 for coke tinplates, 2 forterne plates). (Formerly owned by Pittsburgh Sheet & Tinplate Co.; acquired by Pittsburgh Tin Plate & Steel Corp., Jan., 1919.)

Product and annual cap.: 12,000 tons black plate for tinning and special finish plate; 115,000 base boxes tinplates, 200,000 boxes terne plates.

PITTSBURGH VALVE, FOUNDRY AND CONSTRUCTION CO., 26th St. and A. V. R. R., Pittsburgh, Pa.

Inc. Nov., 1900 in Pennsylvania. Capital stock: com. \$575,000; pref. 6% cum. \$575,000.

C. A. Anderson, P.; J. Roy Tanner, V. P. & G. M.; James D. Robertson, V. P. & G. S. M.; Samuel G. Patterson, Sc. & T.; A. Roy Carson, A.; Alex S. Carson, P. A.

Sales offices:

Birmingham, Young & Vann Supply Co., 1725 First Ave.
Boston, George S. Seltzer, 19 Milk St.
Chicago, J. B. Longini, McCormick Bldg.
Cleveland, Henry M. Wilson, Rockefeller Bldg.
Detroit, Detroit Power Piping Co., 1021 Dime Bank Bldg.
New York, George B. Anderson, 30 Church St.
Philadelphia, Charles A. Anderson, Jr., Widener Bldg.

Works at 26th St. & A. V. R. R., Pittsburgh (ground leased, buildings owned): one 1½-ton 2-phase arc electric fur. installed Dec., 1916, f. o. Dec., 1916. Gray iron, semi-steel and brass foundry.

Product: steel castings for own use and for sale, annual cap., 800 tons; gray iron and semi-steel castings, 6,000 tons; brass castings, 360 tons. Valves, fittings and power piping.

Plattsburg Alloys Corporation, 60 Wall St., New York, built electric furnace plant for manufacture of ferro-silicon at Plattsburg, N. Y., in 1917, f. o. Sept. 1, 1917; acquired by American Carbide Co. early in 1919. Plattsburgh Alloys Corporation was dissolved May 17, 1919. On June 21, 1919, American Carbide Co. sold this plant to The Farmers' Standard Carbide Co., Plattsburgh. The latter company will manufacture calcium carbide only.

Pocahontas Pig Iron Corporation, Roanoke, Va., acquired Graham Furnace from the Virginia Iron, Coal & Coke Co., Aug. 13, 1917. Furnace was operated for the corporation in 1917 and 1918 by John B. Guernsey & Co.; sold to Roanoke Consolidated Iron Corporation, Oct. 1, 1919 and leased to Edward E. Marshall.

POLLAK STEEL CO. (The), P. O. Box 1461, Cincinnati, Ohio.
Inc. 1911 in Ohio.

Emil Pollak, P.; Maurice E. Pollak, V. P.; Julian A. Pollak, V. P.; E. J. Schriever, Sc.; F. Dunbar, G. S.; Charles Judah, T.; J. G. Myers, P. A.; at Cincinnati, Bernard E. Pollak, V. P.; D. E. Sawyer, G. S. M.; at 120 Broadway, New York.

Sales offices:

Boston, George W. Denyven, 259 Franklin St.
Chicago, Frank W. Graves, Railway Exchange Bldg.
Denver, Duncan Bond, Colorado National Bank Bldg.
Detroit, C. A. S. Engineering Co., 790 Woodward Ave.
Houston, Texas, C. G. Elliott, G. F. Cotter Supply Co.
Knoxville, Tenn., W. S. Murrian, 605 Fourth St.
Marquette, Mich., Lake Shore Engine Works.
New Orleans, Otto Schwartz, 515 Whitney Bldg.
New York, D. E. Sawyer, 120 Broadway.
Philadelphia, F. R. Smith, 417 Widener Bldg.

Portland, Ore., Hickok & Hickok, Henry Bldg.

Richmond, Va., William L. Jeffries, Jr., Mutual Bldg.

St. Louis, E. R. Hensel, Security Bldg.

St. Paul, B. W. Parsons.

San Francisco, Hickok & Hickok, 604 Hobart Bldg.

Company operates forge shops at Cincinnati, Ohio and South Chicago, Ill.; and a rolling mill at Marion, Ohio.

Marion Works, Marion, Ohio: blt. 1915-16; 1 cont. heat. fur.; 16" 2-h. 1-st. slitting mill; two 16" 3-h. 1-st. roughing; three 14" 3-h. 2-st. finishing mills. Fuel, coal. (Formerly owned by Interstate Iron & Steel Co.; acquired by The Pollak Steel Co., December 1, 1919). Product: steel rounds, squares, angles, flats, "U" bars, channel flats, concrete bars, etc.; annual cap., 40,000 tons.

Cincinnati Plant, Carthage Station, C. H. & D. R. R., Cincinnati. Product: railway car and locomotive axles and forgings, forgings for automobiles, tractors, agricultural implements, and general industrial work; heavy forgings for marine work, engines and machinery; annual cap., 125,000 tons.

South Chicago Plant, 98th St. & Baltimore Ave., South Chicago. Product: railway car and locomotive axles and forgings, drop forgings for automobiles, tractors, agricultural implements and industrial work; annual cap., 100,000 tons.

Portland Iron & Steel Co., Portland, Maine. Formerly owned steel plant and rolling mill leased by Bancroft and Martin Rolling Mills Co. Rolling mill equipment acquired by Bancroft & Martin Rolling Mills Co., Jan. 1, 1917. The 25-ton B. O. H. fur. (long idle) still remains the property of Portland Iron and Steel Co.

PORTLAND ROLLING MILLS, Ltd. (The), St. John, N. B., Canada.

Inc. Mar. 22, 1899 in Province of New Brunswick. Capital stock: pref. auth. \$90,000.

R. H. Anderson, P.; W. E. Sinclair, V. P.; W. L. Smith, Sc., T., G. M., G. S. M. & P. A.

Brand: "Monarch."

Works at St. John: blt. 1856; rolling mill added 1860, burned and rebt. 1889; 1 busheling fur.; six 3-d. reheat. fur.; 24" 2-h. 3-st.; 18" 2-h. 2-st.; 12" 3-h. 4-st.; 9" 3-h. 4-st. bar mills. Fuel, coal. Spike shop. Cut nail mill with 16 machines, idle for many years.

Product and annual cap.: 3,000 tons scrap bar, 4,800 tons merchant bar iron; 600 kegs railway spikes; 1,200 kegs ship spikes.

Port Moody Steel Works, Ltd., Vancouver, B. C., Canada, see 1916 Directory, p. 264. Works at Port Moody, B. C., said to have been leased to Aetna Iron & Steel Co. and afterwards sold to the Columbia Iron and Steel Co., were sold to the Hyatt Steel Products, Ltd., Bank of Ottawa Bldg., Vancouver, Canada, April 1, 1919.

Potts Brothers Iron Co., Pottstown, Pa., see 1916 Directory, p. 264.

Pottsgrove Iron Works at Pottstown, Pa. was sold to the Nagle Steel Co., Pottstown, Pa., Oct. 15, 1918.

Potts, William M., Wyebrooke, Pa.

Isabella Furnace at Wyebrooke: 1 stack, 60' x 7' 9", blt. 1835, last rebld. 1886; cold blast. Charcoal: local, Lake and foreign ore.

Product: car wheel pig iron, annual cap., 5,400 tons. Last active in 1894. For lease.

Powers (The James F.) Foundry Co., Elkton, Md., see 1916 Directory, p. 265; steel converter sold and removed to The Acme Steel Co., Akron, Ohio in 1916.

PRATT & LETCHWORTH CO., 189 Tonawanda St., Buffalo, N. Y. Inc. Jan. 1, 1896 in New York. Capital stock: com. \$2,400,000; bonds \$600,000.

John C. Bradley, Ch.; John H. Bradley, P. & G. M.; Franklin D. Locke, V. P.; John P. Williams, V. P. & G. S. M.; Willis M. Edwards, Sec., T; Harry M. Lewis, G. S.; Geoffrey J. Letchworth, P. A. Sales office: Detroit, Allen Mosher, 401 Free Press Bldg.

Works at 189 Tonawanda St., Buffalo: orig. blt. 1861; first O. H. steel 1876; four 20-ton A. O. H. fur. Malleable iron foundry.

Product: locomotive and general steel castings for sale, annual cap., 20,000 tons. Malleable iron castings, annual cap., 20,000 tons.

PRESSED STEEL CAR CO., Farmers Bank Bldg., Pittsburgh, Pa. Inc. Jan. 12, 1899 in New Jersey. Capital stock: com. \$12,500,000; pref. 7% non-cum. \$12,500,000.

F. N. Hoffstot, P.; N. S. Reeder, V. P.; J. F. MacEnulty, V. P.; C. E. Church, Sec. & A. T.; at 24 Broad St., New York. J. B. Rider, V. P. & G. M.; W. A. Chamberlain, A.; C. A. Lindstrom, A. P.; H. E. Swartz, T.; F. D. Evans, A. Sc. & A. T.; J. H. Hackenburger, P. A.; at Pittsburgh. J. H. Regan, A. Sc. & A. T.; at Peoples Gas Bldg., Chicago. P. M. Collier, A. G. M.; C. W. Wrenshall, G. S.; at McKees Rocks, Pa. R. M. Mitchell, G. S.; at Pittsburgh, North Side Works.

Sales offices:

New York, C. E. Postlethwaite, G. S. M., 24 Broad St.

Chicago, H. H. Gilbert, M. S., Western Dist., Peoples Gas Bldg.

Pittsburgh, K. C. Gardner, M. S., Central Dist., Farmers Bank Bldg.

St. Paul, H. H. McPherson, Merchants Bank Bldg.

Washington, D. C., L. O. Cameron, Munsey Bldg.

London, England and Paris, France, Davis & Lloyd (agents).

Buenos Aires, Argentina, Portalis & Co.

Shanghai, China, Henry R. Cooper, Jr., McBain Bldg.

Product: pressed and structural steel and composite cars for all classes of railway traffic, tank cars, street cars, mine cars, trucks,

truck frames, bolsters, centre plates, brake beams, stake pockets, stakes, gray iron car wheels, and misc. appliances and specialties for railway cars and misc. pressed steel specialties; oil storage tanks and refinery tanks.

The company owns and operates two car building plants, the Allegheny Freight Car Plant at Pittsburgh, North Side, and the McKees Rocks Freight and Passenger Car Plant at McKees Rocks. Annual cap., 45,000 steel and composite freight cars, 500 steel passenger, baggage, postal, express or street cars; 120,000 truck frames, 250,000 bolsters, 15,000 kegs bolts, 150,000 kegs rivets. The company also leases a steel and malleable iron foundry at McKees Rocks, known as Pennsylvania Malleable Works, described below. The company owns the capital stock of the Central Car Wheel Co., with a plant at McKees Rocks for the manufacture of gray iron car wheels; and the Western Steel Car & Foundry Co. with a plant at Hegewisch, Ill., for the manufacture of freight cars and car parts. The company owns the Koppel Industrial Car & Equipment Co., with plant at Koppel, Beaver Co., Pa., for the manufacture of narrow gauge railway materials, including portable and permanent track, mine cars, cane cars and industrial cars of all descriptions; also plant built in 1919 for the repair of standard gage railway cars. It also controls through stock ownership the Pittsburgh, Allegheny and McKees Rocks R. R. Co., with 25 miles of track, 8 locomotives and 132 freight cars and Steamboat, "Steel Queen."

Pennsylvania Malleable Works, McKees Rocks, Pa. (leased; owned by Pennsylvania Malleable Co.): blt. 1898, f. o. 1899; 1 Swindell & Smythe A. O. H. fur. (15-ton); first steel Nov. 3, 1903. Fuel, nat. gas and pulv. coal. Malleable iron foundry.

Product: steel castings for sale, annual cap., 7,200 tons; malleable iron castings, 20,000 tons; cast-iron car wheels.

Primos Chemical Co., see 1916 Directory, p. 266; acquired by Vanadium Corporation of America, Jan. 1, 1920.

Princess Furnace Co. (Inc.), Glen Wilton, Va., see 1916 Directory, p. 266; acquired by Princess Iron Corporation in April, 1918.

PRINCESS IRON CORPORATION, Glen Wilton, Va.

Inc. Mar. 11, 1918 in Virginia. Capital stock: com. \$1,500,000; pref. 8% cum. \$402,500; bonds \$300,000.

Howard F. Hansell, Jr., P.; Charles E. Loxley, V. P., T. & G. S. M.; George D. Lewis, Sec.; at Philadelphia. Curtis Claypoole, A.; J. Banks Hudson, G. M., G. S. & P. A.; at Glen Wilton.

Sales agents: The Matthew Addy Co., at Real Estate Trust Bldg., Philadelphia and First National Bank Bldg., Cincinnati, Ohio.
Brand: "Princess."

Princess Furnace, Glen Wilton, Va.: 1 stack, 65' x 14'2", blt. 1883-84, rebt. 1912, relined 1919; 3 two-pass Foote stoves, 60' x 16';

1 three-pass Massicks & Crooke stove, 70' x 17'; 2 steam blowing eng. (13,000 cfm.); 6 boilers (5 water-tube, one tubular) 1,250 H. P.; one rotary kiln nodulizing fur. working on foreign lump pyrites cinder, annual cap., 12,000 tons. Pocahontas, New River and Wise Co. coke: local brown hematite and pyrites nodules and at times Lake ore. (Formerly owned by Princess Furnace Co., Inc.; acquired by Princess Iron Corporation, April, 1918.)

Company owns Callie and Circle brown ore mines at Glen Wilton, annual cap., 50,000 tons; operates on lease a limestone quarry at Craigsville, Va., annual cap., 24,000 tons:

Product: foundry pig iron, annual cap., 36,000 tons.

PUGET SOUND IRON & STEEL WORKS, (The), Tacoma, Wash.

Inc. Dec. 9, 1895 in Washington. Capital stock: \$30,000.

John L. Roberts, P., T. & G. M.; E. D. Roberts, V. P.; W. E. Morris, Sc. & P. A.; John L. Roberts, T. & G. S.

Selling agents: Portland, Oregon, F. B. Mallory Co.; San Francisco, Cal., Western Equipment Co.; Vancouver, B. C., Gibson's, Ltd. Works at Tacoma, Wash.: blt. 1895; two 5,000-lb. modified Bessemer converters, f. o. Dec., 1910; 3 cupolas. Fuel, coke. Machine shop for jobbing and manufacture of logging, hoisting, mine and marine engines. Gray iron and brass foundry.

Product: steel castings for sale; manganese and special high carbon steel castings; annual cap., 6,000 tons.

PULASKI IRON CO., 1008 Real Estate Trust Bldg., Philadelphia, Pa.

Inc. Mar. 17, 1884 in Virginia. Capital stock: com. \$450,000.

Horace L. Haldeman, P. & P. A.; B. Frank Hiestand, V. P.; Harry C. Griefzu, Sc. & T.; G. Kammerer, A. Sc. & A. T.; at 1008 Real Estate Trust Bldg., Philadelphia. Percival Johnson, G. M.; M. E. Bowman, A.; at Pulaski.

Brand: "Pulaski."

Furnace at Pulaski, Va.: 1 stack, 80' x 18', blt. 1887, f. o. Feb., 1888; last rebt. 1916; 5 stoves (3 Whitwell, 2 Nelson two-pass); 2 turbo-blowers; 10 boilers, 3,000 H. P. Pocahontas coke: local brown hematite, red hematite and manganiferous iron ores from own mines, purchased Mundie clinker and Lake ore. Company owns and operates iron ore mines at Buchanan, Grady, Vesuvius and Cripple Creek, Virginia, annual cap., 75,000 tons; limestone quarry at Cripple Creek, annual cap., 40,000 tons; coal mine and 448 beehive coke ovens at Eckman, W. Va., annual cap., 115,000 net tons coke.

Product: foundry, high-silicon and mill pig iron, annual cap., 90,000 tons.

PULLMAN CO. (The), Chicago, Ill.

Inc. Feb. 22, 1867 in Illinois. Capital stock: com. \$120,000,000.

J. S. Runnells, P.; E. S. Taylor, A. P.; Clive Runnells, V. P.;

Richmond Dean, V. P.; J. F. Kane, Sc.; W. J. Peters, A. T.; E. C. Morris, A.; at Chicago. J. B. Weaver, V. P.; E. R. Slagle, G. S. M.; H. P. Walden, P. A.; at Pullman, Ill.

The company owns and operates large carbuilding works at Pullman, Ill., comprising shops for the manufacture of wooden passenger and freight cars, steel-underframe, and all-steel passenger and freight cars. Connected with the works is the rolling mill described below.

Rolling Mill at Pullman: blt. 1883-84; 2 forge fires; 7 heat. fur. (two 3-d., one 4-d., gas-fired; four 3-d. coal-fired); 6 gas producers; 18" 3-h. 2-st. bar, 10" 3-h. 4-st. guide; 8" 3-h. 4-st. guide mills. Fuel, coal and prod. gas.

Product: scrap bar, car and merchant iron and steel and special shapes; annual cap., 15,000 tons scrap bar, 60,000 tons merchant bar.

PUNXSUTAWNEY FURNACE CO., Du Bois, Pa.

Inc. 1912 in Pennsylvania. Capital stock: com. \$300,000.

L. W. Robinson, P.; at Rochester, N. Y. B. M. Clark, V. P.; Frank Becker, G. S.; at Punxsutawney, Pa. F. G. St. Clair, Sc., T., A., G. M. & P. A.; C. H. Emerick, G. S. M.; at Du Bois. Brand: "Punxy."

Punxy Furnace, Punxsutawney, Pa. (Owned by Rochester and Pittsburgh Coal and Iron Co.; leased to Punxsutawney Furnace Co., April 1, 1912): 1 stack, 80' x 14', blt. 1896-97, f. o. Sept. 29, 1897; rebld. 1919; 4 Kennedy 2-pass stoves (80' x 18'); 3 steam blowing eng. (40,000 cfm.); 8 water-tube boilers, 2,000 H. P. Beehive coke: Lake ore.

Product: foundry pig iron; annual cap., 80,000 tons.

Punxsutawney Iron & Steel Co., Punxsutawney, Pa., see Clark Steel Hoop Co., and Danville Iron & Steel Co.

QUEEN CITY FOUNDRY CO., Fourth & Wazee Sts., Denver, Col.

Inc. 1890 in Colorado. Capital stock: com. \$200,000.

Alfred Cordingly, P.; Frank Cordingly, V. P.; George A. Cordingly, T. & P. A.; James Donlevy, A.

Works at Denver: blt. 1891; one 4,000-lb. Whiting converter, f. o.

1914; one 1-ton Booth-Hall electric fur., f. o. Nov., 1918; 3 cupolas; gray iron and semi-steel foundry (annual cap., 2,000 tons).

Product: steel castings, railroad, mining and general machinery castings, chrome alloy steel castings; annual cap., 1,500 tons converter, 1,500 tons electric steel castings.

QUINCY STEEL CASTING CO., Inc., 30 Fayette St., Atlantic, Mass.

Inc. April 20, 1917 in Massachusetts. Capital stock: com. auth. \$25,000, issued \$7,600.

Roy G. Lundin, P., T. & G. M.

Works at 30 Fayette St., Atlantic: one 8-pot crucible steel fur., f. o. Aug. 4, 1917.

Product: crucible steel castings, annual cap., 150 tons.

Racine Iron & Metal Co., Racine, Wis., see 1916 Directory, p. 269; properties sold and company liquidated in 1916.

RACINE STEEL CASTINGS CO., Racine, Wis.

Inc. Aug. 18, 1908 in Wisconsin. Capital stock all owned by Belle City Malleable Iron Co.

Judson F. Stone, P.; at Chicago, Ill. C. S. Anderson, Sc. & T.; M. J. Goepfert, G. S.; at Racine.

Works at Racine: blt. 1908, f. o. Oct. 8, 1908; one 3-ton Heroult electric fur., f. o. June, 1916; crucible fur., dismantled in June, 1916.

Product: steel ingots and steel castings for sale, castings for motor trucks and tractors; annual cap., 5,500 tons (2,500 tons ingots, 3,000 tons castings.)

RAIL JOINT CO. (The), 61 Broadway, New York, N. Y.

Inc. 1905 in New York. Capital stock: com. \$2,000,000; pref. \$2,000,000.

Victor C. Armstrong, P.; W. Paton Thomson, V. P.; Benjamin Wolhaupter, Sc.; Fernando C. Runyon, T.

Sales offices:

Boston, India Bldg.

Chicago, Railway Exchange Bldg.

Denver, Equitable Bldg.

Montreal, 606 McGill Bldg. (The Rail Joint Co. of Canada, Ltd.).

New York, 61 Broadway.

Philadelphia, Pennsylvania Bldg.

St. Paul, Merchants Bank Bldg.

St. Louis, Commonwealth Trust Bldg.

San Francisco, 74 New Montgomery St.

Troy, N. Y., Burden Ave.

Product: patented base supported and 100% rail joints for standard, girder and special rail sections; also patented insulated joints, step or compromise rail joints and patented joints for frogs and switches.

Troy Works, Troy, N. Y.: orig. blt. 1819; 2 cont. billet heat. fur.; 1 cont. reheat. fur.; two 21" 3-h. 4-st. bar; 9" Belgian with 12" 3-h. 1-st. roughing, 9" 3-h. 6-st. and 9" 2-h. 1-st. finishing. Fuel, oil for fur.; coal for boilers. Product: rail joints and bars for railroad equipment, annual cap., 60,000 tons.

In addition to its works at Troy, N. Y., the company has eight other manufacturing and distributing points where its patented machinery and devices are used to produce rail joints and parts thereof under contract with other mills. Delivery points are: Joliet, Ill.; Pittsburgh, Johnstown and Steelton, Pa.; Buffalo and Troy, N. Y.; Sault Ste. Marie, Ont.; Columbus, Ohio.

RAILWAY STEEL-SPRING CO., 30 Church St., New York, N. Y.

Inc. Feb. 25, 1902 in New Jersey. Capital stock: com. \$13,500,000; pref. 7% cum. \$13,500,000.

F. F. Fitzpatrick, P.; A. S. Henry, V. P.; M. B. Parker, Sc.; H. S. Banghart, T.; J. L. Suffern, A.; F. J. Foley, G. S. M.; H. C. Harrington, P. A.

Sales offices: Chicago, Ill.; Denver, Col.; Detroit, Mich.; Louisville, Ky.; Norfolk, Va.; St. Louis, Mo.; St. Paul, Minn.

Brand: "Latrobe."

Product: merchant steel, locomotive and car wheel tires, steel rings and flanges, steel-tired wheels for locomotive and passenger equipment, elliptical and coil springs for locomotive, passenger and freight equipment, machinery springs, vanadium and chrome-nickel alloy steel ingots and tool steel.

Latrobe Plant, Latrobe, Pa.: blt. 1888-89, f. o. Aug., 1889; 6 A. O. H. fur. (two 20-ton, one 30-ton, three 40-ton); one 3-ton Heroult electric fur.; five 2-d., four cont. heat. fur.; 5 trains tire rolls; 4 steam ham. (4-ton to 20-ton). Fuel, nat. gas. Machine shop for own use. Product: tires, steel rings, and flanges; alloy steel ingots and tool steel. Annual cap., 100,000 tons open hearth, 2,500 tons electric steel ingots; 50,000 tons locomotive and car wheel tires, steel rings, etc.

Inter-Ocean Plant, Chicago Heights, Ill.: blt. 1909-10, f. o. April 20, 1910; three 50-ton B. O. H. fur.; one 2-d. and two cont. heat. fur.; 3 pit fur.; 3 tire mills; 1 hydraulic forging press. Fuel, prod. gas. Machine shop for own use. Product: ingots, locomotive and car wheel tires and car wheels with rolled steel tires; annual cap., 80,000 tons ingots.

Detroit Works, Detroit, Mich.: f. o. May, 1882, seven 2-d. and four 3-d. reheat. fur.; 18" 3-h. 4-st. bar, 12" 3-h. 1-st. roughing and 9" 3-h. 4-st. guide mills. Fuel, bit. coal. Machine shop for own use. Product: merchant steel, annual cap., 40,000 tons.

The company operates spring works as follows: Chicago Works, Chicago Heights, Ill.; French Works, Pittsburgh, Pa.; Scott Works, Philadelphia, Pa.; St. Louis Works, East St. Louis, Ill. Annual cap., 100,000 tons springs. The company also operates steel-tired wheel works: Depew Works, Depew, N. Y.; Hudson Works, Hudson, N. Y.; Pullman Works, Pullman, Ill.; Scranton Works, Scranton, Pa.

READING IRON CO., Baer Bldg., Reading, Pa.

Inc. Aug. 12, 1889 in Pennsylvania. Capital stock: \$1,000,000.

L. E. Thomas, P.; W. W. Williams, V. P. in charge of Sales and Operation; John M. Callen, V. P. in charge of Purchases and Distribution of Material; George W. Delany, Sc.; H. N. Yost, T.; W. E. Dunham, Production Engineer; E. J. Mishler, S. M.; G. F. D. Hallman, P. A.

Sales offices:

Chicago, R. A. Griffin, 409 Conway Bldg.

Cincinnati, Charles Neblett, 32 Hulbert Block.

Houston, Texas, J. R. Edwards, 702 Mason Bldg.

New York, H. S. Carland, 99 John St.

Philadelphia, A. R. Kinsler, 932 Drexel Bldg.

Pittsburgh, F. M. English, 608 First National Bank Bldg.

Product: pig iron; bar iron, angles; wrought iron pipe, oil well casing, tubing and drill pipe, charcoal iron boiler tubes; nail plate, cut nails; sugar mills, cotton presses, heavy castings, forgings, etc.; muck bar and skelp for own use.

Keystone Furnace Dept., Reading, Pa.: 1 stack, 79' x 18', blt. 1898-99, rebt., 1912-13, relined 1919; 4 Massicks & Crooke stoves, 75' x 19' 6"; 4 steam blowing eng. (58,000 cfm.); one Rust and 8 Cahall boilers, 2,500 H. P. Conn., W. Va. and by-product coke: Lake ore, Swedish ore and Adirondack magnetite and concentrates.

Product: foundry and forge pig iron, annual cap., 100,000 tons. Crumwold Furnace Dept., Emaus, Pa.: 1 stack, 75' x 16' 1", blt. 1872, rebt. 1909, relined 1919; 3 Roberts stoves, 80' x 20'; 2 steam blowing eng. (20,000 cfm.); 4 bat. water-tube and 1 bat. cylindrical boilers, 1,750 H. P. Coke: N. Y. and N. J. magnetite, Lake and Swedish ore.

Product: foundry and mill pig iron, annual cap., 62,000 tons.

Total pig iron capacity, 162,000 tons.

Montour Rolling Mills Dept., Danville, Pa.: orig. built 1845; 21 double and 1 single puddling fur.; 3 rotary squeezers; six 3-d. heat. fur.; four 20" 3-h. 1-st. muck, 20" 3-h. 3-st. bar and skelp, 18" 3-h. 3-st. bar, 12" 3-h. 5-st. bar. Fuel, bit. coal. Product: muck bar, merchant bar iron, grooved skelp; annual cap., 30,000 tons muck bar, 60,000 tons finished rolled products.

Danville Puddle Dept., Danville, Pa.: blt. 1883; 10 double puddling fur.; 1 rotary squeezer; 20" 3-h. 1-st. muck mill. Fuel, bit. coal. Product: muck bar, annual cap., 10,000 tons.

Ninth Street Mills Dept., Reading, Pa.: orig. blt. 1868; 17 double puddling fur.; 2 rotary squeezers; six 4-d. Laughlin gas heat. fur.; 8 gas producers; 23½" 3-h. 2-st. muck, 14" 3-h. 3-st. skelp, universal plate mill with 22" x 50" roughing, 23" x 31" finishing stands. Fuel; bit. coal and prod. gas. Product: muck bar, skelp, socket iron; annual cap., 22,250 tons muck bar, 70,000 tons finished rolled products.

Oley Street Mills Dept., Reading, Pa.: orig. blt. 1896-97; 33 double puddling fur.; 3 rotary squeezers; four 3-d. Laughlin gas heat. fur.; 2 coal-fired fagot heat. fur.; 7 gas producers; two 20" 3-h. 2-st. muck mills, 22" x 59" 3-h. universal plate mill. Fuel, bit. coal and prod. gas. Product: muck bar, annual cap., 50,000 tons; and skelp, annual cap., 42,000 tons.

Sheet Mill Dept., Reading, Pa.: blt. 1863; 12 double puddling fur.;

- one rotary squeezer; four 1-d. coal hand-fired heat. fur.; 22" 2-h. 1-st. muck, 22" x 50" 2-h. sheared plate mill with one roughing and one finishing stand. Fuel, bit. coal. Charcoal bloomery: blt. 1910, f. o. May 24, 1910; 12 knobbling fires; 1 ham. (4,500-lb.). Annual cap., 9,500 tons charcoal blooms from scrap for own use only. Product: muck bar, sheared skelp, and charcoal boiler-tube iron; annual cap., 15,000 tons muck bar, 10,000 tons skelp.
- Tube Works Dept., Reading, Pa.: orig. blt. 1856; 8 pipe mills (3 butt-weld, 5 lap-weld); 2 galvanizing pots. Product: wrought iron pipe, boiler tubes, oil well tubing and casing, poles, signal pipe, etc.; butt-weld pipe from $\frac{1}{8}$ " to 2", lap-weld from 1 $\frac{1}{4}$ " to 20" dia. Annual cap., 240,000 tons (186,000 tons black pipe, 30,000 tons galvanized, 24,000 tons boiler tubes).
- Scott Foundry Dept., Reading, Pa.: orig. blt. 1854; one 2-ton Tropenas converter, f. o. Oct. 18, 1910; 2 cupolas, foundry for gray iron, semi-steel, air furnace castings. Product: steel castings for own use, annual cap., 2,500 tons. Gray iron castings for rolling mills and general machinery, annual cap., 25,500 tons.
- Forge Dept., Reading, Pa.: orig. blt. 1850; 5 ham. (1 shingling 5-ton, four forge 12-ton, 6-ton, 3-ton and 3,000-lb.). Product: marine, cotton press and general iron and steel forgings; annual cap., 5,000 tons light and 10,000 tons heavy forgings.
- Birdsboro Dept., Birdsboro: blt. 1848; 16 double puddling fur., 4 heat. fur.; 20" 3-h. muck and 24" skelp and nail plate; 75 cut nail machines; steam, electric and water power. Electroplate galvanizing plant. Fuel, bituminous coal. (Formerly owned by the E. & G. Brooke Iron Co.; acquired by Reading Iron Co., Jan. 5, 1920.) Product: muck bar, nail plate and skelp; cut nails, plain and galvanized. Annual cap., 100,000 kegs cut nails, 18,000 tons rolled products.
- Pottstown Dept., Pottstown: blt. 1884-85, rebld. 1894; 22 double puddling fur.; 2 squeezers; two oil heat. fur.; three 21" 2-h. 1-st. muck; 22" 3-h. 1-st. grooved nail plate; 105 cut nail machines. Fuel, bit. coal and oil. (Formerly owned by George B. Lessig Co.; acquired by Reading Iron Co., Aug. 16, 1919.) Product: muck bar, nail plate and "Reading" cut nails; annual cap., 30,000 tons muck bar, 15,000 tons nail plate, 200,000 kegs cut nails.
- Columbia Mill, Columbia, Pa.: blt. 1854; 14 double puddling fur.; six 2-d. heat. fur.; 18" 3-h. 2-st. muck; 18" 3-h. 3-st. and 10" 3-h. 5-st. skelp mills. (Formerly owned by Susquehanna Iron Co.; acquired by Reading Iron Co., April 1, 1920.) Product: muck bar, skelp; annual cap., 20,000 tons muck bar, 40,000 tons skelp.
- Susquehanna Mill, Columbia, Pa.: blt. 1860; 15 single and 8 double puddling fur.; 18" 3-h. 2-st. muck mill. (Formerly owned by Susquehanna Iron Co.; acquired by Reading Iron Co., March 7, 1920.) Product: muck bar; annual cap., 20,000 tons.

The Reading Iron Co. owns iron ore rights in Albemarle, Amherst and Nelson Counties, Va., aggregating 3,400 acres; also the Big Pond Furnace lands in Cumberland County, Pa., containing 5,923 acres; 7,540 acres of coal lands at Kimmelford, Somerset Co., Pa., with operating mine producing 1,000 tons per day; 260 acres of timber and ore lands at New Ringgold, Schuylkill Co., Pa.; 600 acres timber and farming lands at Millerstown, Perry Co., Pa.; limestone quarry at Bowers Station, Pa., annual cap., 18,000 tons.

READING STEEL CASTING CO., Reading, Pa.

Inc. July 19, 1916 in Pennsylvania. Capital stock: com. auth. \$272,500, issued \$206,400; pref. 7% cum. auth. \$127,500, issued \$127,500.

J. Turner Moore, P. & G. M.; M. G. Moore, V. P. & G. S. M.; A. P. Haines, Sc.; D. R. Bomberger, T.; Samuel Huber, G. S.; D. S. Light, P. A.

Works at Reading: blt. 1901, f. o. May 1, 1901; four 2-ton Tropenas converters; 2 A. O. H. fur. (20-ton); 2 cupolas. Machine shop.

Product: steel castings for sale; alloy steel castings; annual cap., 28,200 tons (7,200 tons converter, 21,000 tons open-hearth castings).

Redcliff Rolling Mills & Bolt Co., Ltd. (The), Redcliff, Alberta, Canada, see 1916 Directory, p. 273, was sold to the Canadian Western Steel Co., Calgary, Alberta, Canada, May 1, 1916; and acquired by Canadian Western Steel Corporation, July 1, 1919.

RED RIVER COMPANY, Clarksville, Tenn.

Inc. Nov. 13, 1919 in Tennessee. Capital stock: com. \$100,000. Graham Macfarlane, P.; Graham Macfarlane, Jr., V. P. & G. M.; L. C. Nisbet, Sc. & T.; P. D. Cospen, G. S. & P. A.; at Clarksville.

Sales agents: Hickman, Williams & Co., Cincinnati, Ohio.

Brands: "Red River" and "Helen."

Helen Furnace at Clarksville (leased; owned by Red River Furnace Co.): 1 stack, 70' x 16', blt. 1892, f. o. Dec. 8, 1895; relined 1919; 3 Whitwell stoves, 60' x 20'; 3 steam blowing engines; 15 boilers (3 Cahall water-tube, 12 flue) 1,350 H. P. Coke: local brown ore. Company owns iron mines at Louise and Hortense, Tenn., and limestone quarry, annual cap., 30,000 tons, at Clarksville.

Product: foundry, high silicon and silvery pig iron and ferro-silicon, annual cap., 36,000 tons.

Red River Furnace Co., Clarksville, Tenn., see 1916 Directory, p. 273, owns Helen Furnace, Clarksville, leased to Red River Iron Works, December, 1915; leased to Red River Company, Dec. 1, 1919.

REED FOUNDRY & MACHINE CO., Kalamazoo, Mich.

Inc. May 12, 1913 in Michigan. Capital stock: com. auth. \$100,000, issued \$50,000.

Joseph E. Brown, P.; H. C. Lutge, V. P.; J. E. Welborn, Sc. & T.

Works at Kalamazoo: one 1½-ton converter, blt. 1914, f. o. July, 1914. Fuel, coke.

Product: steel castings for sale and for own use for general machinery purposes, automobiles, engines, etc., annual cap., 2,000 tons.

REEVES MANUFACTURING CO., Dover, Ohio.

Inc. Oct., 1900 in Ohio. Capital stock: com. \$1,000,000.

H. C. Greer, P.; at Morgantown, W. Va. James Rees, V. P.; J. A. Krantz, Sc. & P. A.; A. J. Krantz, T.; A. H. Reeves, S.; Clem Shamp, A. S.; R. G. Harrison, G. S. M.; at Dover.

Dover Rolling Mill at Dover: blt. 1903-04, f. o. Oct. 13, 1904; three 3-d. coal-fired heat. fur.; rotary squeezer; 20" 3-h. 2-st. skelp; 8 black sheet mills (28" x 34" to 28" x 44"); 4 cold mills (three 24" x 44", one 24" x 52"); 8 comb. heat. fur.; 8 box annealing fur.; 1 Mesta 3-arm pickling mach.; 3 galvanizing pots, annual cap., 20,000 tons. Charcoal forge: blt. 1903-04, f. o. Oct. 19, 1904; 16 knobbling fires; one 5,000-lb. steam ham. Charcoal blooms for own use from scrap., annual cap., 15,000 tons.

Product: charcoal iron blooms, skelp; black and galvanized iron and steel sheets; annual cap., 15,000 tons billets and bars, 10,000 tons skelp, 36,000 tons sheets, 5,000 tons long terne plates.

Reily, John W., see 1916 Directory, p. 274, owns Lucknow Forge, Lucknow, Pa., leased to Pine Iron Works.

RELIANCE STEEL CASTING CO., 28th & Smallman Sts., Pittsburgh, Pa.

Inc. 1910 in Pennsylvania. Capital stock: com. \$200,000.

J. A. Kelly, P.; E. A. Blasdel, Sc., T. & G. M.; J. G. Thompson, P. A.

Works at 28th & Smallman Sts., Pittsburgh: blt. 1910, f. o. Jan. 2, 1911; one 20-ton A. O. H. fur. Machine shop.

Product: steel castings; chrome, nickel and manganese alloy steel castings for own use and for sale; castings for blast furnace tops; crushing machinery, rolls and gear blanks; annual cap., 6,000 tons.

REPLOGLE STEEL CO., 120 Broadway, New York, N. Y.

Inc. Oct. 30, 1919 in Delaware. Capital stock: com. auth. 500,000 shares no par value, issued 250,000 shares.

J. Leonard Replogle, Ch.; L. K. Diffenderfer, T.; at 120 Broadway, New York. W. H. Brevoort, P.; at 111 Broadway, New York. C. M. MacNeill, V. P.; at 25 Broad St., New York. S. H. Bell, Sc. & P. A.; at Wharton, N. J.

Sales office: 120 Broadway, New York.

Wharton Furnaces, Wharton: 2 stacks; No. 1, dismantled Dec., 1919; No. 2, 90' x 21' 6", blt. 1900-01, f. o. Aug. 15, 1901, rebuilt 1920; No. 3, 90' x 21' 6", blt. 1902-03, f. o. Nov. 13, 1903, rebuilt 1920; 8 hot-blast stoves (8 Roberts, 100' x 20'); 6 steam blowing eng. (323,000 cfm.); 24 water-tube boilers, 8,400 H. P.; Pittsburgh

Coal Washer Co. double-strand pig casting machine; sintering plant for flue dust, magnetic concent rates and residuum scale. By-product and Conn. coke: New Jersey magnetite and Lake ores. (Formerly owned by Wharton Steel Co.; taken over by Replogle Steel Co., Nov. 6, 1919.)

Product: basic, bessemer and foundry pig iron; annual cap., 292,000 tons.

Company owns Replogle Mine at Wharton and Hibernia Mine at Hibernia, N. J., annual cap., 360,000 tons iron ore; limestone quarry at Ogdensburg, N. J., annual cap., 200,000 tons limestone.

REPUBLIC IRON & STEEL CO., Republic Bldg., Youngstown, Ohio. Inc. May 3, 1899 in New Jersey. Capital stock: com. auth. \$27,352,000, issued \$27,191,000; pref. 7% cum. \$25,000,000; bonds Dec. 31, 1918, \$12,941,000.

John A. Topping, Ch.; at 17 Battery Place, New York. T. J. Bray, P.; H. L. Rownd, V. P.; J. W. Deetrick, V. P. & G. M.; Richard Jones, Jr., Sec.; H. M. Hurd, T.; C. M. Pierce, A.; P. J. Gordon, G. S.; W. B. Topping, G. S. M.; S. H. Hedges, P. A.; at Youngstown.

Sales offices:

Birmingham, E. M. Barnes, Woodward Bldg.

Buffalo, 903 White Bldg.

Cincinnati, M. E. McKee, First National Bank Bldg.

Chicago, H. W. Craig, 1008 McCormick Bldg.

Cleveland, W. E. Collier, 540 Leader-News Bldg.

Dallas, Texas, William Anderson, 831 Wilson Bldg.

Detroit, C. S. Powers, 625 Ford Bldg.

New York, Frank Phalen, 17 Battery Place.

Philadelphia, W. H. Oliver, 902 Morris Bldg.

Pittsburgh, C. T. Johnston, Oliver Bldg.

St Louis, T. R. Talbot, Federal Reserve Bank Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Product: pig iron; blooms, billets, slabs and sheet bars; merchant bars, concrete bars, shapes, small I beams, channels, sheared plates, skelp, pipe; steel sheets and sheet metal products, cold rolled shafting, turnbuckles, spikes, bolts, nuts, washers, etc.

Haselton Furnaces, Youngstown: 5 stacks.

No.	Present size	Built	Last rebuilt	Relined
1	74' 5" x 16' 9 $\frac{3}{4}$ "	1867	1913	1917
2	85' x 21'	1905-06	1918	—
3	85' x 21'	1905-06	1917	—
4	90' 4 $\frac{1}{2}$ " x 22'	1910-11	1914	1917
5	95' x 22'	1916-17	—	—

Nineteen stoves (12 Kennedy center-comb. including four 101' 10" x 22', eight 97' 10" x 22'; 7 side-comb. stoves, six 101' 10" x 22', one 80' x 18'); 13 steam blowing eng. and 3 steam turbo-

blowers (347 000 cfm.); 37 water-tube boilers, 22,583 H. P., serve also in part open hearth and water purification dept.; 2 Uehling double-strand pig casting mach.; 5 slag granulating pits, annual cap., 510,000 tons. By-product and Conn. coke: Lake ore. Iron foundry for own use. Product: bessemer and basic pig iron, annual cap., 900,000 tons.

Hannah Furnace, Youngstown: 1 stack, 75' 3½" x 16' 5", blt. 1880, last rebt. 1917; 4 stoves (3 Kennedy side-comb., 80' x 18'; 1 McClure center-comb., 85' x 18'); 3 steam blowing eng. (52,000 cfm.); 7 water-tube boilers, 2,710 H. P.; one slag granulating pit, annual cap., 62,000 tons. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 120,000 tons.

Atlantic Furnace, New Castle, Pa.: 1 stack, 75' x 16' 3¾", blt. 1868, last rebt. 1913, relined 1917; 4 Kennedy side-comb. stoves, 80' x 18'; 3 steam blowing eng. (52,000 cfm.); 6 water-tube boilers, 2,400 H. P.; one slag granulating pit, annual cap., 62,000 tons. Installing one Uehling pig casting machine. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 120,000 tons.

Hall Furnace, Sharon, Pa.: 1 stack, 62' 1" x 14' 1", blt. 1845, last rebt. 1910, relined 1917; 5 iron pipe stoves; 3 steam blowing eng. (25,000 cfm.); 4 water-tube boilers 1,315 H. P.; one slag granulating pit, annual cap., 31,000 tons. Conn. coke: Lake ore. Product: bessemer and basic pig iron, annual cap., 60,000 tons.

Pioneer Furnaces, Thomas, Ala.: 3 stacks; No. 1, 85' x 20', blt. 1886-88, last rebt. 1915, relined 1919; No. 2, 85' x 18', blt. 1889-90, last rebt. 1916; No. 3, 85' x 20', blt. 1901-02, last rebt. 1908, relined 1918; 12 Massicks & Crooke stoves, 85' x 21'; 14 steam blowing eng. (196,000 cfm.); 22 water-tube boilers, 9,400 H. P.; one Uehling double-strand pig casting mach.; 3 slag granulating pits, annual cap., 203,000 tons. Beehive coke: local red and brown hematite ore. Product: foundry and mill pig iron; annual cap., 325,000 tons.

Total annual capacity of the 11 blast furnaces, 1,525,000 tons.

Open Hearth Steel Works, Youngstown: blt. 1910-13, first steel June 12, 1911, first rolled products June 13, 1911; 14 B. O. H. fur. (70-ton); one 400-ton mixer; molten metal from Haselton Furnaces; 8 four-hole soaking pits; 5 cont. rehear. fur.; 40" 2-h. 1-st. blooming; 21" 2-h. 4-st. cont. billet; 18" 2-h. 6-st. cont. comb. sheet bar and billet; 16" 2-h. 8-st. and 14" 2-h. 3-st. cont. merchant; one 3-h. sheared plate mill, 32" and 22" x 90". Fuel, producer gas and coke oven gas. Product: ingots; blooms, billets, slabs, sheet bars; boiler, tank, ship and bridge plates, skelp, merchant bars, light structural shapes. Annual cap., 670,000 tons ingots.

Bessemer Steel Works, Youngstown: blt. 1900, first steel Sept. 10, 1900; two 10-ton Bessemer converters; 6 cupolas; one 250-ton mixer; molten metal from Haselton Furnaces; 5 four-hole soaking pits; 40" 2-h. 1-st. blooming; 26" 2-h. 3-st. semi-cont. billet; 28"

2-h. 2-st. and 28" 3-h. 1-st. sheet bar; 18" 2-h. 4-st. cont. billet. Fuel, prod. gas. Product: ingots, billets, sheet and tinplate bars, and flats. Annual cap., 725,000 tons ingots.

Brown-Bonnell Works, Youngstown: orig. blt. 1846; 10 cont. heat. fur.; 20" 3-h. 2-st. and 20" 2-h. 1-st. skelp; 20" 3-h. 2-st. and 20" 2-h. 1-st. bar; 12" 3-h. 4-st. and 12" 2-h. 1-st. bar; 10" 2-h. 2-st. cont. and 10" 3-h. 7-st. hand; 10" 2-h. 4-st. cont. and 10" 3-h. 3-st., 10" 2-h. 2-st. hand; 10" cont. skelp, with 12" 2-h. 2-st. hor., 12" 2-h. 2-st. vert., 10" 2-h. 3-st. hor., 10" 2-h. 1-st. edging, 10" 2-h. 3-st. finishing; 10" to 8" hoop with 10" 3-h. 1-st., 8" 3-h. 5-st., 10" 3-h. 1-st.; 8" cont. with 10" 2-h. 4-st. roughing, 8" 3-h. 3-st. and 8" 2-h. 2-st. finishing; 7" cont. with 10" 2-h. 5-st. roughing, 7" 2-h. 3-st. and 7" 3-h. 3-st. finishing; spike and washer dept. Product: merchant bars, light structural shapes, hoops, skelp, spikes and washers. Annual cap., 450,000 tons rolled products, 150,000 kegs spikes, 18,000 kegs washers.

Mahoning Valley Works, Youngstown: cold rolled shafting works. Product: piston rods and line shafting from $\frac{1}{4}$ " to 5" diameter, annual cap., 7,500 to 10,000 tons.

Tube Works, Youngstown: blt. 1909-10, f. o. April, 1910; 3 butt-weld fur. for pipe $\frac{1}{8}$ " to 3"; 6 lap-weld fur. for pipe 2" to 16"; 2 galvanizing pots; 3 coupling welding machines. Product: standard, extra strong, double extra strong, tubing, casing, drive and misc. pipe, annual cap., 228,000 tons.

Niles Works, Niles, Ohio: blt. 1909, f. o. Nov. 1, 1909; 1 sheet, 2 pair and 1 annealing fur.; 1 jobbing plate mill, 28" x 60"; 9 sheet and 9 pair fur.; 9 hot black sheet mills (two 28" x 34", three 28" x 38", three 28" x 42", one 28" x 46"); 5 cold mills (one 22" x 60", four 22" x 48"); 3 box annealing fur.; 6 pickling mach.; 4 galvanizing pots. Fuel, coal. (Formerly owned by The Deforest Sheet & Tinplate Co.; acquired by Republic Iron & Steel Co., May 9, 1919). Will add in 1920 eight hot black sheet mills (one 30" x 64", three 30" x 44", four 30" x 38"); 6 cold mills (one 26" x 66", five 26" x 48"); 8 sheet and 8 pair fur.; 6 double box annealing fur.; annual cap., 60,000 tons black sheets. Product: steel sheets, galvanized sheets, black plate for tinning, annual cap., 52,000 tons; metal roofing, siding, ceiling, etc., pressed steel products.

Inland Works, East Chicago, Ind.: blt. 1889; 6 double puddling fur.; 10 busheling fur.; 1 squeezer; six 5-d. heat. fur.; 21" 3-h. 2-st. muck. bar; 18" 3-h. 2-st. and 18" 2-h. 1-st. bar; 14" 3-h. 2-st., 9" 3-h. 3-st. and 9" 2-h. 1-st. guide; 10" 3-h. 1-st., 8" 3-h. 3-st., 8" 2-h. 1-st. guide. Product and annual cap.: muck and scrap bar, 40,000 tons, merchant bars, 60,000 tons.

Sylvan Works, Moline, Ill.: blt. 1894; 1 cont. heat. fur.; 16" 3-h. 1-st. slitting and roughing, 12" 3-h. 4-st. intermediate, 12" 3-h. 2-st. and 12" 2-h. 1-st. finishing rail rerolling mill. Fuel, coal.

Product: merchant bars, agricultural shapes; annual cap., 50,000 tons.

Indiana Bolt Works, Muncie, Ind. Product: bolts, nuts and washers, annual cap., 17,000 tons. Brazil wrought iron open hexagonal turnbuckles, annual cap., 1,200 tons.

IRON ORE PROPERTIES

In the Lake Superior region the company operates the Cambria and Lillie mines in the Marquette Range and the Bray, Schley, Victoria, Franklin, Pettit, Kinney and Gordon mines in the Mesabi range, estimated annual cap., 2,000,000 tons. The company also controls the Minckler and Sherwood mines at Iron River, Mich. The company owns a one-half interest in the Union Ore Co. and an interest in the Mahoning Ore & Steel Co., which operate mines in the Mesabi Range; and a one-half interest in the Antoine Ore Co., which operates mines in the Menominee Range.

In Alabama the company has large holdings of red and brown iron ore lands and operates the following mines on this property; Alfretta (4 slopes), Raimund (3 slopes), Houston, Tannehill, and Spaulding. The company owns a one-half interest in the Potter Ore Co.

COAL AND COKE PROPERTIES.

By-product Coke Works, Youngstown, Ohio: blt. 1913-15, f. o. April, 1914; 143 Koppers by-product coke ovens, annual cap., 700,000 net tons of coke. By-product recovery plant. Otto benzol plant, annual cap., 3,600,000 gals.

The company owns coking coal lands in Fayette Co., Pa. with 646 beehive coke ovens (400 at Republic, 246 at Martin), annual cap., 452,200 net tons. The company also owns about 1,900 acres of steam coal lands in Washington Co., Pa.

In Alabama the company owns and operates the Warner, Sayretton, Thompson, and Palos mines and 1,010 beehive coke ovens (910 at Thomas, 100 at Republic) with an annual cap., of 606,000 net tons coke.

The company owns an interest in the Lake Erie Limestone Co. and the Union Limestone Co., which operate quarries near Carbon, Pa.; also owns the Dale quarry at Dale, Ala., and the Dolomite quarry at Thomas, Ala.

The company owns the Republic Transportation Co. and an interest in the Cambria Steamship Co., which are engaged in the ore carrying trade on the Great Lakes.

The company also owns an interest in the Republic Supply Co. and the General Water Co.

RHODE ISLAND CRUCIBLE STEEL CO., 604 South Main St., Providence, R. I.

Org. May, 1910; not incorporated.

Works at 604 South Main St., Providence: four 8-pot crucible fur., f. o. Jan. 8, 1920. Fuel, oil.

Product: small steel castings, annual cap., 1,200 tons.

Rhode Island-Perkins Horse Shoe Co., Providence, R. I., see 1916 Directory, p. 279; stockholders voted to liquidate in Aug., 1917; rolling mill sold and dismantled.

RICHMOND IRON WORKS, Richmond Furnace, Mass.

Inc. April 18, 1905 in Massachusetts. Capital stock: com. \$80,000.

Samuel G. Colt, P., T. & G. M.; Ray C. Williams, V. P., Sc. & G. S.

Selling agents: Rogers, Brown & Co., Cincinnati.

Brand: "Richmond."

Richmond Furnace, Richmond Furnace, Mass.: 1 stack, 35' x 9', blt. 1829, rebt. 1863, remod. 1905; 28-pipe iron stove; 2 steam blowing eng. (3,000 cfm.); 2 water-tube boilers, 150 H. P. Charcoal: local limonite ore. Company owns iron ore mine near furnace, annual cap., 12,000 tons.

Product: warm blast charcoal pig iron, annual cap., 5,000 tons.

Cheshire Furnace at Cheshire, Mass., was dismantled in 1919.

River Furnace Co. (The), see 1916 Directory, p. 280, merged in The McKinney Steel Co., Jan., 1918.

Riverdale Iron & Steel Co., see Armour Steel Co.

RIVERDALE ROLLING MILL CO., 136th St. & I. C. R. R., Chicago, Ill.

Inc. Aug. 30, 1917 in Illinois. Capital stock: com. \$60,000.

H. A. Lanman, P.; Charles B. Lanman, Sc.; E. B. Lanman, T.

Selling agent: F. W. Graves, 213 Railway Exchange Bldg., Chicago.

Works at 136th St., Riverdale, Chicago: two 4-d. coal-fired heat. fur.; 18" 3-h. 1-st. muck, 10" 3-h. 5-st. bar. (Formerly owned by Armour Steel Co.; acquired by Riverdale Rolling Mill Co. in 1917).

Product: merchant bars; annual cap., 6,000 tons scrap bar, 11,000 tons finished rolled products.

RIVERSIDE STEEL CASTING CO., Lincoln Highway & Passaic River, Newark, N. J.

Inc. April 7, 1905 in New Jersey. Capital stock: com. auth. \$100,000, issued \$33,800; pref. 8% cum. auth. \$25,000, issued \$20,000.

Thomas Malcolm, P.; J. Smylie Kinne, Sc. & T.; Daniel Guldner, P. A.; at Newark. J. Phillip Bird, V. P.; at 30 Church St., New York.

Works at Kearny, N. J. (leased; owned by Newark Plaster Co.): three 8-ton A. O. H. fur., f. o. Dec. 11, 1911; crucible steel fur., abandoned in 1916.

Product: steel castings for sale, annual cap., 1,500 tons.

ROANE IRON CO., Chattanooga, Tenn.

Inc. 1867 in Tennessee. Capital stock: com. \$1,000,000; bonds \$313,000.

D. P. Montague, P.; L. D. Tyson, V. P.; M. Chamberlain, Sc. & T.; at Chattanooga. E. O. Wells, G. S.; at Rockwood, Tenn.

Selling agents: Boston, Mass., and New York City, Alley & Page; Chicago, Cincinnati and Cleveland, Domhoff & Joyce Co.; St. Louis, The Matthew Addy Co.

Brand: "Rockwood."

Rockwood Furnaces, Rockwood, Tenn.: 2 stacks, No. 1, 80' x 16', blt. 1893, f. o. Jan. 6, 1894, reblt. 1901; No. 2, 80' x 17', f. o. July, 1901; 8 fire-brick stoves (five 75' x 20', three 75' x 18'); 6 Macbeth steam blowing eng. (86,000 cfm.); 8 water-tube and 16 flue boilers, 3,065 H. P. Coke: local ore. Company owns 375 beehive coke ovens (150 idle) at Rockwood, annual cap. of active ovens, 85,000 net tons: iron ore mines at Rockwood and near Chamberlain, Tenn.; annual cap., from all ore mines, 300,000 tons: coal property, leased to a mining company, annual cap., 200,000 tons. Iron foundry, annual cap., 600 tons. Machine shop.

Product: foundry and forge pig iron, annual cap., 140,000 tons.

Roanoke Consolidated Iron Corporation, Roanoke, Va., owns Graham Furnace, Graham, Va., leased to Edward E. Marshall.

ROBESONIA IRON CO., Ltd. (The), 21 South 12th St., Philadelphia, Pa.

Inc. April 1, 1885 in Pennsylvania. Capital stock: com. \$300,000. William C. Freeman, Ch.; Robert C. Lea, Sc. & T.; at Philadelphia. John W. Gocher, G. S.; at Robesonia.

Selling agents: Robert C. Lea & Co., 426 Stephen Girard Bldg., 21 South 12th St., Philadelphia.

Brand: "Robesonia."

Robesonia Furnace, Robesonia, Pa.: 1 stack, 80' x 18', blt. 1855, last reblt. 1915, relined 1918; 4 stoves (2 McClure, 85' x 18', 2 Roberts, 90' x 18'); 3 Weimer steam blowing eng. (34,000 cfm.); 7 water-tube boilers, 2,200 H. P.; one Greenawalt sintering pan, blt. 1915, annual cap., 20,000 tons sintered Cornwall ore. Coke: Cornwall ore and purchased low-phosphorus ores. Company owns mining rights at Cornwall Ore Banks, Cornwall, Pa., annual cap., 100,000 tons.

Product: low-phosphorus pig iron, annual cap., 60,000 tons.

Rochester & Pittsburgh Coal & Iron Co., see 1916 Directory, p. 282, owns Adrian Furnace, Dubois, Pa., leased to Adrian Furnace Co.; and Punxy Furnace, Punxsutawney, Pa., leased to Punxsutawney Furnace Co.

ROCKAWAY ROLLING MILLS CORPORATION, Rockaway, N. J.

Inc. July 1, 1919 in Delaware. Capital stock: 60,000 shares, no par value.

C. C. Grover, P. & G. M.; at Rockaway. H. F. Hansell, Jr., V. P.;

George D. Lewis, Sc. & T.; at Broad & Sansom Sts., Philadelphia, Pa.

Rockaway Rolling Mill, Rockaway: blt. 1900-01; three 3-d. coal-fired heat. fur.; 14" 3-h. 1-st. roughing and 10" 3-h. 4-st. guide mill. Fuel, coal.

Product: merchant bar iron and steel, angles, double refined iron and staybolt iron, annual cap., 13,000 tons.

Rockaway Rolling Mill (The), Rockaway, N. J., see 1916 Directory, p. 282; acquired by Rockaway Rolling Mills Co., July, 1918; acquired by Rockaway Rolling Mills Corporation, September, 1919.

ROEBLING'S (JOHN A.) SONS CO., 612 South Broad St., Trenton, N. J.

Inc. Jan. 1, 1876 in New Jersey. Capital stock: com. \$15,000,000.

K. G. Roebling, P.; W. A. Roebling, V. P.; F. W. Roebling, Jr., Sc. & T.; A. C. Cooley, A. Sc. & A. T.; C. C. Cooley, G. S. M.; J. W. Gaskill, P. A.

Sales offices:

Atlanta, Ga., 69 Walton St.

Boston, Mass., 93 Pearl St.

Chicago, Ill., 165 West Lake St.

Cleveland, Ohio, 701 St. Clair Ave., N. E.

Los Angeles, Cal., 216 South Alameda St.

New York, N. Y., 117 Liberty St.

Philadelphia, Pa., 223 Arch St.

Pittsburgh, Pa., Sandusky & Robinson Sts., North Side.

Portland, Ore., 487 Lovejoy St.

San Francisco, Cal., 624 Folsom St.

Seattle, Wash., 900 First Ave., South.

Washington, D. C., 1107 Woodward Bldg.

Product: iron, steel and copper rods and wire, wire strand and rope, flat wires, insulated wires and cables, wire cloth.

Kinkora Works, Roebling, N. J.: blt. 1905-06; 6 A. O. H. fur. (30-ton); 6 B. O. H. fur. (40-ton); 9 cont. heat. fur.; 16 gas. prod.; 35" 3-h. 1-st. blooming mill; 18" cont. and looping rod mill with 20-st. 18" to 11". Fuel, coal, prod. gas. and oil. Heavy and fine wire drawing blocks, wire from .001 to .460, galvanizing (7 pans), tempering and annealing shops. Wire cloth and netting shops.

Product: ingots, billets, wire rods, wire and wire cloth, annual cap., 150,000 tons ingots, 115,000 tons wire rods, 90,000 tons plain wire.

Upper Works, Trenton, N. J.: est. 1852; 2 cont. heat. fur.; 4 gas prod.; 18" modified Garrett rod mill with 18" 3-h. 2-st. roughing and 18" to 11" 2-h. 12-st. looping mill. Wire mills, galvanizing (19 pans), tinning and heat treating departments, cold rolling mills, wire rope shops and insulating depts. Product: steel and

copper rods, wire, wire rope, flat wire and insulated wire. Annual cap., 40,000 tons wire rods, 60,000 tons plain wire.

Buckthorn Works, Trenton, N. J.: reblt. 1915; rope shop, insulated wire and cable depts.

Total annual cap., 150,000 tons ingots (70,000 acid, 80,000 basic open hearth); 155,000 tons wire rods, 150,000 tons plain wire, 25,000 net tons copper rods and copper wire.

§ **ROGERS-BROWN IRON CO., Erie County Bank Bldg., Buffalo, N. Y.**
Inc. Dec. 27, 1909 in New York. Capital stock: com. \$5,000,000, pref. 7% cum. auth. \$2,000,000, issued \$1,550,000; bonds \$7,436,000. William A. Rogers, P.; Hugh Kennedy, V. P. & G. M.; John D. Larkin, 2 V. P.; Wm. S. Rogers, Sc.; H. T. Clement, T.; David G. Williams, A.; John H. Kennedy, G. S.; Charles H. Byron, P. A. Selling agents: Rogers, Brown & Co.

Rogers-Brown Iron Co. Furnaces, Buffalo: 4 stacks (2 thin-lined); Nos. 1 and 2, each 80' x 20', blt. 1902-04; No. 1, f. o. Sept. 27, 1904, No. 2, July 5, 1905; Nos. 3 and 4, 85' x 21', blt. 1910-12; No. 3, f. o. Feb. 5, 1912, No. 4, Aug. 1, 1912; 16 Kennedy one-pass stoves, 102' x 22'; 9 steam blowing eng. (82,000 cfm.); 48 watertube boilers, 12,000 H. P. Coke: Lake ore. One Uehling double-strand casting machine.

Product: foundry, malleable, basic and bessemer pig iron, annual cap., 500,000 tons.

The company owns the lease of the Susquehanna Mine at Hibbing, Minn.; controls the Munro Iron Mining Co., which operates the Rogers, Chicagon and Hiawatha Mines near Iron River, Mich., and the Munro Mine at Norway, Mich.; annual cap., about 1,500,000 tons.

The company also controls the Cascade Coal & Coke Co., which has 800 beehive ovens at Sykesville and Tyler, Pa.; annual cap., about 500,000 net tons coke.

ROME IRON MILLS, Inc., 30 Church St., New York, N. Y.

Inc. May 1, 1917 in New York. Capital stock: 20,000 shares, no par value; 15,500 shares issued.

E. M. Zehnder, P.; at 1025 Electric St., Scranton, Pa. B. A. Clements, V. P. & G. S. M.; Lee Deutsch, Sc. & T.; F. N. Foote, C.; at 30 Church St., New York. J. M. Strawbridge, G. S.; at Rome, N. Y.

Works at Rome, N. Y.: orig. blt. 1868; 14 double puddling fur.; one rotary squeezer; five 3-d. reverb. heat. fur.; one 20" 3-h. 2-st. muck; 18" 3-h. 3-st. bar, 12" 3-h. 3-st. guide, 8" 3-h. 5-st. guide. Fuel, bit. coal. Machine shop.

Product: staybolt and engine bolt iron; annual cap., 28,000 tons.

Rome Merchant Iron Mill, Rome, N. Y. Name changed to Rome Iron Mills, Inc., May, 1916.

ROSS-MEEHAN FOUNDRIES, Chattanooga, Tennessee.

Inc. Jan. 15, 1889 in Tennessee. Capital stock: com. \$60,000.

G. F. Meehan, P. & G. M.; R. E. L. Meehan, V. P. & G. S. M.;
M. G. Y. Forman, Sc. & T.; Henry Bond, A.; T. D. Buford, P. A.

Works at Chattanooga: blt. 1889; one 2,200-lb. Tropenas converter,
f. o. Feb. 5, 1914; one cupola. Gray iron, semi-steel and malleable
iron foundry; 2 cupolas. Machine shop.

Product: steel castings for own use and for sale, annual cap., 3,000
tons; gray iron (20,000 tons), semi-steel (15,000 tons), white iron
(5,000 tons) and malleable iron (12,000 tons) castings.

ROTHERT PROCESS STEEL CO., 622 Harriman St., Seattle, Wash.

Inc. Oct. 20, 1915 in Washington.

E. H. Rothert, P. & G. M.; E. L. Gaines, Sc. & T.; A. F.
Slater, G. S. M.

Works at Seattle: one 2-ton electric fur., one 2-ton alloy (electric) fur.

Product: steel ingots, alloy steel ingots; carbon and high speed tool
steel; annual cap., 550 tons.

Rudgear-Merle Co., San Francisco, Cal., see 1916 Directory, p. 285.,
was sold to the Simmons Co., Kenosha, Wis., Jan. 1, 1916.

RUSSELL SHOVEL CO. (The), Aliquippa, Pa.

Works at Aliquippa: built 1893; 3 heat. fur.; 1 train rolls.

Product: shovel blanks for own use only, annual cap., 1,700 tons.

Safety Insulated Wire & Cable Co., New York, see 1916 Directory, p. 286. Steel casting plant at New Haven, formerly owned by National Steel Foundry Co., sold to Penn Seaboard Steel Corporation, Oct. 11, 1916.

St. Louis Blast Furnace Co., St. Louis, Mo., see 1916 Directory, p. 286. Missouri Furnace was sold to the Mississippi Valley Iron Co. in 1916.

ST. LOUIS COKE & CHEMICAL CO., 208 South La Salle St., Chicago, Ill.

Capital stock: com. \$1,000,000; pref. 8% cum. auth. \$10,000,000, issued \$5,000,000.

Clement Studebaker, P.; Arthur Roberts, Ch. Ex. Com.; George W. Niedringhaus, V. P.; George T. Buckingham, V. P.; Scott Brown, Sec. & T.; A. C. Barclay, C.; at 208 S. La Salle Street, Chicago. L. E. Fischer, G. M.; P. E. Irvine, G. S.; at 737 Boatmens Bank Bldg., St. Louis. T. G. Kus, P. A.; at 1003 Lytton Bldg., Chicago.

Sales office: W. G. Maguire, 208 South La Salle St., Chicago.

Blast furnace and by-product coke plant, Granite City, Ill.: 1 stack, construction begun Aug. 16, 1919, to be completed about June 1, 1920, 86' x 20' 6"; four stoves, 100' x 22', 2 steam turbo-blowers (20,000 cfm.); 7 water-tube boilers, 4,160 H. P.; one single-strand pig casting mach. By-product coke; Lake ore. Product: basic pig iron, annual cap., 200,000 tons.

By-product coke plant (building); 80 Roberts flueless by-product ovens, annual cap., 510,000 net tons coke. By-product recovery plant. Robert's benzol plant, annual cap., 2,930,000 gals. light oil.

ST. LOUIS FROG & SWITCH CO., 6500 Easton Ave., St. Louis, Mo.

Inc. June 12, 1906 in Missouri. Capital stock: com. auth. \$200,000, issued \$198,400; pref. 7% cum. auth. \$150,000, issued \$77,200. John J. Lichter, P.; R. S. Colnon, V. P.; R. E. Einstein, Sec., T. & G. M.

Sales agents:

Chicago, M. C. B. Co., McCormick Bldg.

Dallas, Texas, W. D. Jenkins, Praetorian Bldg.

Denver, Alfred Connor, Majestic Bldg.

Houston, Texas, W. D. Jenkins, 810 Carter Bldg.

Los Angeles, Western Engineering Sales Co., 407 East 3rd St.

New Orleans, W. D. Jenkins, Whitney Central Bldg.

Salt Lake City, R. J. Cooper, Kearns Bldg.

San Francisco, American Transmarine Co., Inc.

Works at 6500 Easton Ave., St. Louis: two 3-ton Tropenas converters, f. o. Oct., 1914; 2 cupolas. Fuel, coke.

Product: manganese steel castings for railroad track work, crushing machinery and safes; small carbon steel castings for general purposes, annual cap., 3,500 tons. Frogs, switches, crossings, switch stands, special track work, etc., annual cap., 6,000 tons. Drop forgings, machine forgings, car forgings and pressed steel work, annual cap., 2,500 tons.

ST. LOUIS SCREW CO., Clarence & Bulwer Aves., St. Louis, Mo. Est. 1887, inc. Apr. 15, 1911. Capital stock: com. \$750,000; bonds \$90,000.

E. J. Miller, P. & G. M.; W. S. Ashton, V. P.; Geo. Gruenewald, Sc. & T.; A. E. Krug, G. S. M.; G. A. Guenther, P. A.

Works at 6900 North Broadway, St. Louis: blt. 1914-15, f. o. May, 1915; four heat. fur. (two 4-d., two 5-d.); 5 single and 1 double busheling fur.; 1 squeezer; 2 forge fires; 20" 3-h. 2-st. muck; 18" bar with 1-st. 2-h. and 2-st. 3-h.; 14" 3-h. 2-st. roughing, 9" finishing with 2-st. 2-h. and 2-st. 3-h.; one 500-lb. ham. Fuel, pulverized coal.

Product: bolt, nut and rivet rods for own use; merchant bars, rounds, squares $\frac{3}{8}$ " to 3", flats to 8" wide; annual cap., 45,000 tons.

Bolt, Nut and Screw Plant, Clarence & Bulwer Aves., St. Louis.

Product: bolts, nuts, screws, spikes and washers, 20,000 tons.

St. Louis Steel Foundry Co., Wellston, P. O., St. Louis, Mo., see 1916 Directory, p. 287; plant closed down and dismantled in 1919.

ST. MAURICE FOUNDRIES, Ltd., Three Rivers, P. Q., Canada.

H. G. French, P. & G. M.; W. J. Miller, V. P.; Paul Dumoulin, Sc. & T.

Works at Three Rivers: one modified Bessemer converter. Gray iron, semi-steel and brass foundry.

Product: steel castings, annual cap., 2,000 tons; gray iron and semi-steel castings, 500 tons; brass, copper, phosphor-bronze and aluminum castings.

SALISBURY IRON CORPORATION, Lime Rock, Conn.

Inc. Jan., 1920 in Delaware. Capital stock: com. 20,000 shares, no par value; pref. \$400,000.

William M. McIntyre, P.; Andrew Fulkerson, Sc.

Brand: "Salisbury."

Canaan Furnaces, East Canaan, Conn.: 2 stacks, No. 1, 40' x 9' 6", blt. 1840, rebt. 1880; No. 3, 35' x 9', blt. 1872; new stack 45' x 10' 4½", construction begun June 1, 1918, work suspended Jan. 1919; warm blast, iron pipe stoves, rotary blowers; 5 tubular

boilers, 1,000 H. P. Charcoal: brown hematite ore from own mines. Retort plant for charcoal (idle). Gray iron and car wheel foundry. (Formerly owned by Barnum-Richardson Co.; acquired by Salisbury Iron Corporation, Jan., 1920.)

Product: charcoal pig iron, annual cap., 10,000 tons.

Company owns and operates iron ore mines at Ore Hill, Conn., and Boston Corners, N. Y., annual cap., 24,000 tons.

SALT LAKE IRON & STEEL CO., 540 West Seventh St. South, Salt Lake City, Utah.

Inc. 1915 in Utah. Capital stock: com. \$200,000; pref. 7% cum. \$100,000; bonds \$70,000.

O. C. Beebe, P.; David A. Smith, V. P.; Willard R. Smith, Sc.; A. G. Beebe, T.; George M. Stratton, G. M.; George A. Parry, P. A.

Works at 540 West Seventh St. South, Salt Lake City: blt. 1904; one 6,000-lb. Tropenas converter, f. o. Sept. 2, 1911; 2 cupolas. Gray iron and semi-steel foundry, machine shop, boiler shop, blacksmith shop and structural fabricating shop.

Product: steel castings for own use and for sale, nickel-chrome alloy steel castings; annual cap., 3,600 tons. Gray iron (3,000 tons) and semi-steel (1,000 tons) castings, brass castings, mining machinery and structural iron work.

Samson Iron Works, Stockton, Cal., see 1916 Directory, p. 287. Was sold to the Samson Sieve-Grip Tractor Co., Aug. 28, 1916.

Samson Sieve-Grip Tractor Co., Stockton, Cal., acquired works of Samson Iron Works, Stockton, Aug. 28, 1916; crucible furnaces dismantled April, 1918; electric fur. installed 1916. Steel foundry dismantled Feb., 1919. Company is owned by General Motors Corporation.

Schuylkill Haven Rolling Mill, Schuylkill Haven, Pa., see 1916 Directory, p. 288; acquired by The National Steel Rolling Co., April 6, 1920.

Scottdale Furnace Co., Cleveland, Ohio, see 1916 Directory, p. 288; merged in McKinney Steel Co., in January, 1918.

SCRANTON BOLT & NUT CO., Scranton, Pa.

Inc. May 17, 1899 in Pennsylvania. Capital stock: com. \$500,000. E. M. Zehnder, P.; C. E. Brodhead, V. P. & G. S. M.; L. M. Horton, Sc. & T.; J. W. Leverich, G. S.; at Scranton. C. H. Zehnder, V. P.; at 120 Broadway, New York.

Sales offices: Philadelphia, Foster Manufacturing & Supply Co., 20th & Venango Sts.; Richmond, Va., Taylor Brothers, 618 East Main St.

Works at Scranton: blt. 1899; 7 double puddling fur.; 1 squeezer; six 3-d. heat. fur.; 20" 3-h. 2-st. muck, 18" 3-h. 2-st. bar, 12" 3-h. 5-st. guide, 10" bar with 14" 3-h. 1-st. and 10" 3-h. 5-st., 16" 2-h. 1-st. universal mill for bars to 10" wide. Fuel, pulverized coal. Machine shop for own use. Bolt and nut factory.

Product: merchant bars, light rails, bolts, nuts, spikes, etc.; annual cap., 40,000 tons bars, 15,000 tons bolts, nuts, etc., 40,000 kegs spikes.

SCULLIN STEEL CO., 6700 Manchester Ave., St. Louis, Mo.

Inc. July 7, 1899 in Missouri. Capital stock: com. \$1,500,000; bonds, \$728,500.

Harry Scullin, P.; G. L. L. Davis, V. P.; V. C. Turner, Sec. & T.; L. C. Perry, G. S.; J. W. Hargate, P. A.; at St. Louis. F. L. Norton, V. P.; at Grand Central Terminal Bldg., New York.

Sales offices:

Chicago, E. S. Wortham, McCormick Bldg.

New York, F. L. Norton, V. P., Grand Central Terminal Bldg.

St. Paul, B. W. Parsons, Merchants Bank Bldg.

Works at St. Louis: twelve 30-ton B. O. H. fur. Fuel, oil. Machine shop for jobbing. Building a rolling mill to be completed about May, 1920 to consist of 22" 3-h. 4-st., 16" 3-h. 2-st. roughing with 12" 3-h. 5-st. finishing mills, to roll merchant steel, squares, rounds to 6", beams and channels 4" to 12", angles to 6" x 6", flats to 12", Z bars, and light rails to 40-lb. section.

Product: steel ingots and steel castings, bolsters and truck sides; annual cap., 100,000 tons steel ingots, 75,000 tons steel castings.

SEABOARD STEEL & MANGANESE CORPORATION, 2 Rector St., New York, N. Y.

Stanton S. Freeman, Receiver.

Temple Furnace, Temple, Pa.: 2 stacks (alternate); No. 1, 75' x 16', rebt. 1875, relined 1918; No. 2, 80' x 18', blt. 1917-18, f. o. July 25, 1918; 4 McClure 3-pass stoves (three 75' x 18', one 75' x 20'); 3 steam blowing eng.; 4 water-tube and 2 sets cylindrical boilers, 1,600 H. P. Conn coke: Lake and Port Henry ore. Product: foundry pig iron, annual cap., 50,000 tons; or ferro-manganese and spiegeleisen, annual cap., 15,000 tons.

Seaboard Steel Casting Co., Chester, Pa., see 1916 Directory, p. 289, was sold to the Penn Seaboard Steel Corp., May, 1916. The Penn Seaboard Steel Corp. sold the plant to the American Locomotive Co., July 2, 1917.

SEATTLE SMELTING CO., 204 Mehlhorn Bldg., Seattle, Wash.

Works at Seattle: one 3-phase 450 KW electric furnace, f. o. 1918.

Product: ferro-manganese.

SEIDEL, J. A., Marysville, Pa.

J. A. Seidel, Owner; John Seidel, Manager.

Perry Forge, Marysville: blt. 1862; 7 forge fires; 1 hammer (2,000-lb.).

Product: charcoal blooms from scrap for sale, annual cap., 4,000 tons

Seidel Brothers, Marysville, Pa., see 1916 Directory, p. 290, Perry Forge acquired by J. A. Seidel.

SELLERS MANUFACTURING CO., 4651 Pensacola Ave., Chicago, Ill.

Inc. April 24, 1895 in Illinois. Capital stock: com. auth. \$400,000. issued \$300,000; pref. 6% cum. auth. \$400,000, issued \$350,000.

John M. Sellers, P.; G. M. Hogan, Sc. & G. S. M.; at 1201 McCormick Bldg., Chicago. R. A. Van Houten, V. P. & G. M.; W. H. Siegmund, T.; Fred Knaus, G. S.; H. J. Stumpf, P. A.; at 4651 Pensacola Ave., Chicago.

Sales office: 1201 McCormick Bldg., Chicago, Ill.

Works at Mayfair, Chicago: blt. 1907; 6 rotary busheling fur.; 1 squeezer; 4 heat. fur. (one 3-d., three 5-d.); 22" 3-h. 1-st. bar, 22" 3-h. 3-st. bar; one ham. 6,000-lb. Finishing dept. for shearing, punching, etc., tie plates, angle bars, etc.

Product: iron tie plates, angle bars and switch slide plates, annual cap., 18,000 tons scrap bar, 40,000 tons tie plates, angle bars, etc.

SENECA IRON & STEEL CO., 307 Erie County Savings Bank Bldg., Buffalo, New York.

Inc. Oct. 18, 1906 in New York. Capital stock: com. \$750,000. Hugh Kennedy, P.; James S. Paterson, V. P.; H. M. Van Horn, Sc.; Alexander Paterson, T. & G. M.; A. T. Hunt, S. M.; Austin T. Hunt, P. A.

Works at Blasdell, Erie Co., N. Y.: blt. 1907, f. o. Oct. 7, 1907; 7 comb. heat. fur.; 14 hot sheet mills, 28" x 48"; 8 cold mills, 24"; 8 double-box annealing fur.; 2 pickling mach. Fuel, coal and producer gas.

Product: blue annealed and black sheets, stamping, deep drawing, enameling, japanning and automobile sheets, annual cap., 80,000 tons.

Seyfert Rolling Mill, Seyfert Station, Reading, Pa., see 1916 Directory, p. 290. Was leased to Nagle Steel Co., Pottstown, Pa., June 1, 1916 and sold to that company February 6, 1919.

Seyfert, Simon, Estate of, Blandon, Pa., see 1916 Directory, p. 291, was sold to the Blandon Rolling Mill, Inc., Blandon, Pa., March 13, 1917.

Shapiro, Morris and Roney, John D., Owners, Pratt & Fremont Sts., Baltimore, Md.

Works at Baltimore & 8th Sts., Baltimore (R. R. Station, Highlandtown): blt. 1916, f. o. Jan., 1917; nine electric fur. (six 3-phase arc, 3 resistance). Electric power from Baltimore Gas & Electric Co. (Formerly owned by Tungsten Products Co. of Maryland; acquired by Shapiro and Roney, Feb. 11, 1920). *For sale or lease.*

Product: ferro-tungsten and ferro-molybdenum; annual cap., 1,000 tons.

SHARON FOUNDRY CO., P. O. Box 541, Sharon, Pa.

Inc. March, 1902 in Pennsylvania. Capital stock: com. auth. \$500,000, issued \$492,000.

W. W. Shilling, P. & G. M.; Thomas Kennedy, Sc., T. & G. S.; Joseph H. Kennedy, G. S. M.

Works at Wheatland, Pa.: blt. 1903; two 2-ton A. O. H. fur.; f. o. Dec. 18, 1905.

Product: steel castings for sale, machinery castings; annual cap., 10,000 tons.

SHARON STEEL HOOP CO., Sharon, Pa.

Inc. Oct. 8th, 1900 in Pennsylvania. Capital stock: com. auth. \$15,000,000, issued \$12,300,000; bonds \$1,600,000.

Severn P. Ker, P.; H. T. Gilbert, V. P.; Trusten P. Draper, V. P.; J. Reid Evans, Sc. & T.; R. I. Maher, A.; B. E. Kibbee, G. S. M.; A. D. Troth, P. A.

Sales offices:

Chicago, Arthur S. Booth, McCormick Bldg.

Cincinnati, S. E. Anning, Union Trust Bldg.

Cleveland, G. A. Singer, Garfield Bldg.

Detroit, A. A. Keally, Book Bldg.

New York, Edward Caterson, 17 Battery Place.

Philadelphia, Harrison Bldg.

St. Louis, E. R. Hensel Steel & Copper Co., Security Bldg.

San Francisco, J. W. Richards, Monadnock Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Mary Furnace, Lowellville, Ohio: 1 stack, 81' x 19', blt. 1845, last remod. 1898, relined 1919; 5 Kennedy 2-pass side-combustion stoves (four 80' x 18', one 80' x 20'); 3 steam blowing eng. (40,000 cfm.); 8 water-tube boilers, total 3,750 H. P.; 1 Heyl & Patterson single-strand pig casting machine; 1 slag granulating pit, annual cap., 72,000 tons. Conn. coke: Lake ore. Gray iron foundry (1,200 tons). (Formerly owned by The Ohio Iron & Steel Co.; acquired by the Sharon Steel Hoop Co., Feb. 1, 1918).

Product: basic pig iron; annual capacity, 130,000 tons.

Steel Plant, Lowellville, Ohio: blt. 1914-15; first steel made Sept. 1, 1915; 6 B. O. H. fur. (75-ton); four 4-hole soaking pits; 34" 2-h. 1-st. reversing blooming; 21" 2-h. 8-st. Morgan continuous sheet bar and billet mill. Fuel, producer gas. (Formerly owned by the Youngstown Iron & Steel Co.; acquired by the Sharon Steel Hoop Co., March 1, 1917). Product: steel ingots, annual cap., 250,000 tons; slabs, blooms, billets and sheet bars; annual cap., 210,000 tons.

Rolling Mill, Youngstown, Ohio: blt. 1901; f. o. Sept. 4, 1901; plate mill added 1910; 30" x 72" 3-h. sheared plate mill; two 2-h. jobbing plate mills (30" x 60"; 29" x 48"); 7 hot black sheet mills (two 29" x 32", two 29" x 36", two 29" x 42", one 29" x 48"); 4 cold mills (26" x 66", 26" x 56", two 26" x 48"); 4 box annealing fur.; 4 hand pickling tanks; 2 galvanizing pots. (Formerly owned by the Youngstown Iron & Steel Co.; acquired by the Sharon Steel Hoop Co., Mar. 1, 1917). Product: sheared plates and black, blue annealed and galvanized sheets; annual cap., sheared plates 54,000 tons, black sheets 70,000 tons.

Sharon Works, Sharon, Pa.: blt. 1900-01, f. o. Mar. 15, 1901; 5 B. O. H. fur. (30-ton); 2 A. O. H. fur. (30-ton); first acid steel made April 24, 1903; first basic steel made Feb. 8, 1905; 7 regenerative heat. fur. (4-d.); 3 cont. recuperative heat. fur.; 25" 3-h. 1-st. blooming, 14" 2-h. 5-st. billet; 18" 2-h. 3-st. and 14" 2-h. 5-st. strip mill; 12" 2-h. 4-st. and 10" 2-h. 5-st. hoop; 12" 2-h. 4-st. and 9" 2-h. 5-st. hoop; 8" 2-h. 5-st. hoop; 2 pickling machines; 3 cont. pickling tanks; 2 galv. pots. Fuel, prod. gas. Product and annual cap.: 150,000 tons ingots (108,000 tons basic, 42,000 tons acid); 135,000 tons blooms, billets and slabs; 180,000 tons hoops, bands, strips and cotton ties.

SHARPSVILLE FURNACE CO. (The), 2119 Oliver Bldg., Pittsburgh, Pa.

Inc. May, 1906. Capital stock: com. \$100,000; pref. 6% cum. auth. \$100,000, none issued; bonds \$110,000.

George S. Davison, P.; A. P. Meyer, Sc.; Allen S. Davison, T.; at Pittsburgh. R. W. Coats, G. S.; at Sharpsville.

Selling agents: Allen S. Davison Co., Pittsburgh.

Sharpsville Furnace at Sharpsville, Pa.: 1 stack, blt. 1847, last remod. 1908, 65' x 15'; 4 stoves; 3 steam blowing eng. (21,000 cfm.); 5 water-tube boilers, 1,500 H. P. Slag granulating pit, annual cap., 25,000 tons. Coke: Lake ore.

Product: bessemer, malleable and foundry pig iron, annual cap., 70,000 tons.

Shawinigan Electro Products Co. (The), Baltimore, Md., name changed to The Baltimore Electro Alloys Co., Dec. 17, 1919.

SHAWINIGAN FOUNDRIES, Ltd., Shawinigan Falls, P. Q., Canada.

Inc. Dec. 28, 1919 in Dominion of Canada. Capital stock: com. auth. \$75,000, issued \$70,000; pref. 7% cum. auth. \$75,000, issued \$45,000.

C. G. Macartney, P. & G. M.; at McGill Bldg., Montreal. W. G. Dauncey, V. P. & G. S.; C. M. Hall, Sc., T. & P. A.; at Shawinigan Falls.

Sales office: McGill Bldg., 211 McGill St., Montreal.

Works at Shawinigan Falls: f. o. Aug., 1917; one 5-ton electric fur.; electric power from Shawinigan Water & Power Co. (Formerly

owned by Fraser, Brace & Co., Ltd., acquired by Shawinigan Foundries, Ltd., Jan. 1, 1920.) Gray iron, semi-steel, brass, bronze and aluminum foundry.

Product: low-phosphorus and foundry pig iron from scrap, annual cap., 8,000 tons; gray iron, brass, bronze, etc., castings.

Sheffield Coal & Iron Co., 71 Broadway, New York, see 1916 Directory, p. 292; acquired by Sheffield Iron Corporation, Aug. 13, 1917.

SHEFFIELD IRON CORPORATION, 71 Broadway, New York, N. Y.
Inc. Aug. 13, 1917 in New York. Capital stock: com. 20,500 shares, no par value; pref. 7% non-cum. \$675,000; bonds \$550,000. Walter S. Reed, P.; James R. Floyd, V. P. & T.; John S. Levis, Jr., Sc. & A. T.; A. C. Edwards, A. Sc.; at 71 Broadway, New York.

Sales agents: Birmingham, Ala., Tutwiler & Brooks; Boston, Mass., J. O. Henshaw; Cincinnati, Ohio, The Matthew Addy Co.

Sheffield Furnace, Sheffield, Ala.: 1 stack, 75' x 17', blt. 1887-88, last rebt. 1917-18, blown in Aug. 1918; 5 Roberts stoves, 90' x 20'; 3 steam blowing eng.; 5 Sterling water-tube boilers, 2,500 H. P. Coke: local brown hematite ore. Two stacks abandoned and dismantled. (Formerly owned by Sheffield Coal & Iron Co.; acquired by Sheffield Iron Corp., Aug. 13, 1917.)

Product: foundry pig iron, annual cap., 90,000 tons.

The company owns iron ore mines at Russellville, Ala., and West Point, Tenn., annual cap., 180,000 tons; 300 beehive coke ovens at Jasper, Ala., annual cap., 125,000 tons.

SHELBY IRON CO., Shelby, Ala.

Inc. 1890 in New Jersey. Capital stock: com. \$1,000,000.

M. W. Bush, P.; J. G. Hendrick, A. T.; at Birmingham, Ala.

W. W. Jacobs, V. P.; at Hartford, Conn. B. Y. Frost, Sc. & T.;

at 80 Broadway, New York. D. F. Farrar, S.; at Shelby, Ala.

Selling agents: New York, Alley & Page, 16 Exchange Place; Birmingham, Ala., Hammond-Byrd Iron Co.

Brand: "Shelby."

Shelby Furnaces, Shelby, Ala.: 2 stacks, No. 1, 60' x 14', blt. 1863, rebt. 1899; No. 2, 60' x 14', blt. 1873; 6 iron pipe stoves, 18' x 12'; 3 steam blowing eng. (30,000 cfm.); 5 water-tube boilers, 1,500 H. P. Charcoal: local brown and purchased hard red ore from Birmingham district. Foundry for washer and furnace plant castings, annual cap., 100 tons.

Product: warm-blast charcoal pig iron, annual cap., 50,000 tons.

The company owns brown iron ore mine at Shelby, Ala., annual cap., 60,000 tons; also 49 charcoal kilns at various points, annual cap., 2,100,000 bushels.

Shelby Steel Tube Co., Pittsburgh, Pa., see 1916 Directory, p. 293, was taken over by the National Tube Co., July 1, 1917.

Shenandoah Iron & Coal Co., Philadelphia, Pa., see 1916 Directory, p. 294, purchased by J. T. Jackson, 13th & Chestnut Sts., Philadelphia, Jan., 1916 under foreclosure proceedings. Company dissolved.

SHENANGO FURNACE CO. (The), 812 Oliver Bldg., Pittsburgh, Pa. Inc. Jan. 23, 1906 in Pennsylvania. Capital stock: \$5,000,000. W. P. Snyder, Ch.; W. P. Snyder, Jr., P.; C. D. Dyer, V. P.; George L. Collord, V. P. & G. M.; H. M. Wilson, Sec.; Henry Irwin, Jr., T.; at Pittsburgh. E. J. Maney, M. of Mines; at Duluth, Minn. Paul O. Menke, S. of Blast Furnaces; at Sharpsville, Pa. Stewart Dyer, S. of Coal and Coke Works; at Wilpen, Pa. C. J. Peck, M. of Steamships; at Cleveland, O.

Sales agents: W. P. Snyder & Co., Pittsburgh, Pa.

Brands: "Shenango," "Mabel Malleable."

Products: pig iron, iron ore, coal and coke.

Shenango Furnaces, Sharpsville, Pa.: 3 stacks, No. 1, 88' x 21', blt. 1906, rebt. 1914, relined 1919; 4 McClure stoves, 85' x 20'; No. 3, 80' x 18' 6", blt. 1895, rebt. 1911, relined 1919; 4 McClure stoves, 85' x 19' 6"; No. 4, 75' x 15', blt. 1872, last rebt. 1916; 4 Pollock iron pipe stoves; 10 steam blowing eng. (140,000 cfm.); 17 water-tube boilers, 7,000 H. P.; one Heyl & Patterson double-strand casting machine; one slag granulating pit (annual cap., 90,000 tons); slag crushing plant, annual cap., 200,000 tons. Gray iron foundry, annual cap., 3,000 tons. Conn. coke: Lake ore.

Product: bessemer, basic and malleable pig iron, annual cap., 435,000 tons.

Iron ore properties: on the Mesabi Range owns lease of the Shenango, Webb, Whiteside and Tioga mines; annual cap., 2,000,000 tons; South Tener mine as reserve. On the Menominee Range owns one-half interest in Antoine Ore Co., which operates the Clifford and Traders mines. On the Cuyuna Range owns 680 acres of undeveloped ore lands.

Steamship properties: owns the steamers, "Shenango," 12,000 tons; "Col. James M. Schoonmaker," 14,000 tons; and "William P. Snyder, Jr.," 14,000 tons. Associated interests own the stock of The Shenango Steamship Co., steamers; "W. P. Snyder," 10,000 tons, and "Wilpen," 11,000 tons.

Coal and coke properties: owns 650 acres of coal lands at Wilpen, Westmoreland Co., Pa., annual cap., 400,000 tons. Also 200 beehive coke ovens at Wilpen, annual cap., 120,000 tons coke.

Limestone properties: owns interest in capital stock of Lake Erie Limestone Co., with large quarries at Lowellville, Ohio, annual cap., 250,000 tons.

SIMMONS COMPANY, Kenosha, Wis.

Inc. Dec., 1915 in Delaware. Capital stock: com. auth. \$20,000,000, issued \$8,543,500; pref. auth. \$20,000,000, issued \$7,000,000. Z. G. Simmons, P.; A. H. Lance, V. P. & T.

Company operates plants at Kenosha, Wis., San Francisco, Cal., Elizabeth, N. J., Atlanta, Ga., and 6 plants in Canada, for the manufacture of metal beds, springs, cots, couches, etc. The company operates rolling mills as described below, for the production of parts for own use.

Kenosha Works, Kenosha, Wis.: rolling mill built 1916, f. o. Aug. 15, 1916; 1 cont. rail heat. fur.; 16" 3-h. 1-st., 12" 3-h. 6-st. and 9" 3-h. 4-st. bar mills. Product: splits and rerolls old rails into angles, flats, squares and rounds for own use only, annual cap., 35,000 tons.

San Francisco Works, San Francisco: blt. 1900; rolling mill added 1906-07, f. o. Mar. 4, 1907; 2 heat. fur., one cont. rail heat. fur.; 12" 3-h. 7-st. bar mill. (Formerly owned by Rudgear-Merle Co.; acquired by the Simmons Co., Jan. 1, 1916.) Product: splits and rerolls old rails into angles, flats, rounds and squares for own use only, annual cap., 15,000 tons.

SIMONDS MANUFACTURING CO., 55 North St., Fitchburg, Mass. Inc. April 1868, in Massachusetts. Capital stock: com. auth. \$2,000,000, issued \$1,800,000; pref. 7% cum. \$1,000,000.

Alvan T. Simonds, P.; Thomas F. Howarth, V. P.; Harlan K. Simonds, T.; Gifford K. Simonds, G. M.; John E. Kelly, Sec. & G. S. M.; at Fitchburg. Henry A. Sargent, V. P.; at Portland, Oregon. O. A. Olson, V. P.; at Chicago, Ill.

Sales offices in the large cities.

Product: saws, machine knives, files, high grade steel sheets and bars. Operates saw plants at Fitchburg, Mass., Chicago, Ill., and Montreal, P. Q., Canada; steel plant at Lockport, N. Y.

Lockport Works, Lockport, N. Y.: blt. 1910-11; four 30-pot crucible fur.; two 6-ton Heroult electric fur., f. o. Sept. 7, 1911; 11 heat. fur. (five 2-d., three 3-d., three 6-d.); 6 rehear. fur. (four 2-d., two 3-d.); 16" bar mill with 4-st. 3-h. and 1-st. 2-h.; 10" bar mill with 4-st. 3-h. and 1-st. 2-h.; one sheet roughing mill, 24" x 54"; 6 sheet finishing mills (24" x 72" circular saw finishing mill; 22" x 15" band saw mill with 1-st. 3-h. roughing, 1-st. edging, 1-st. 3-h. and 1-st. 2-h. finishing; two 20" x 32" hand saw mill with 1-st. 3-h. and 1-st. 2-h.; 18" x 34" 2-h. 2-st. cross-cut mill; 30" x 90" 2-h. 2-st. large circle mill); one steam ham. (8,000-lb.); 2 annealing fur.; 2 pickling tanks.

Product: saw plates for own use, high grade steel sheets, alloy sheets, and bars for sale. Annual cap., 10,000 tons crucible and 11,000 tons electric steel ingots, 7,000 tons bars, 6,000 tons sheets.

SINGER MANUFACTURING CO., Singer Bldg., New York, N. Y. Musconetcong Furnace, Stanhope, N. J.: 1 stack, 80' x 17', blt. 1871, rebld. 1900; 3 fire-brick stoves, 79' x 19' and 1 equalizer; 2 steam blowing eng.; 1 water-tube and 12 tubular boilers, 970 H. P. Coke: New Jersey magnetite, Lake, Cuban and other ores. (For-

merly owned by Musconetcong Iron Works; merged in Singer Manufacturing Co., May, 1917.)

Product: foundry pig iron for own use only, annual cap., 50,000 tons.

Rolling Mill, Elizabethport, N. J.: blt. 1903; heat. fur.; hot and cold trains; annealing fur.; wire drawing blocks.

Product: rounds, flats, etc., for own use only, annual cap., 15,000 tons.

SIVYER STEEL CASTING CO., 37th Ave. & Mitchell St., Milwaukee, Wis.

Inc. Jan., 1909 in Wisconsin. Capital stock: com. auth. \$350,000, issued \$225,000; pref. auth. \$50,000, issued \$30,600.

F. L. Sivyver, P.; C. R. Messinger, 1 V. P.; Donald Frazer, 2 V. P.; Wm. C. Frye, Sec. & T.; R. J. Doty, G. S.; Burtner Fleeger, G. S. M.; L. S. Peregoy, A. Sc. & P. A.

Selling agent: St. Paul, Minn, S. J. Pfaff, Pioneer Bldg.

Works at 37th Ave. & Mitchell St., Milwaukee, Wis.: blt. 1910, f. o. Apr. 3, 1910; 2 electric fur. (one 1-ton Snyder, one 3-ton Pittsburgh); first electric steel, Apr. 19, 1916; crucible fur. dismantled in 1915; one 1-ton Tropenas converter.

Product: steel castings for sale for automobiles, auto trucks, tractors and general machinery; vanadium and nickel alloy steel castings; special carbon steels; steel wheels for motor trucks. Annual cap., 7,500 tons electric, and 2,500 tons converter, steel castings.

SIZER FORGE CO., 244 Larkin St., Buffalo, N. Y.

Inc. 1902 in New York. Capital stock: com. \$125,000; bonds \$500,000.

C. B. Porter, P.; G. F. Scherer, V. P.; S. R. Norton, V. P. & G. M.; T. W. Hammond, Sec. & T.; V. B. Schupp, G. S. M.; J. H. Watkins, P. A.

Sales offices:

Chicago, Marshall C. Edmunds, 208 South LaSalle St.

Detroit, L. D. Stanton, 459 Book Bldg.

New York, J. A. Gibney, Jr., 111 Broadway.

Philadelphia, S. H. deCoursey, 473 Bourse Bldg.

Pittsburgh, D. A. Stuart, 1108 First National Bank Bldg.

San Francisco, Ford & Geirrine, Merchants' Exchange Bldg.

Springfield, Mass., W. L. Goodrich, Massasoit Hotel.

Works at 244 Larkin St., Buffalo: rebt. 1917-19; two 10-ton Heroult electric fur.; 2 hydraulic forging presses (1,000-ton, 1,500-ton); 5 steam ham. (2,500-lb. to 12,000-lb.); ten 4-d. heat. fur.; smith shop with 800-lb. ham. Machine shop.

Product: steel ingots; alloy steel ingots; steel forgings of all descriptions and of any analysis or heat treatment, forged only, rough or finished machined. Annual cap., 24,000 tons electric steel ingots.

SKAGIT STEEL & IRON WORKS, Sedro-Woolley, Wash.

Inc. Nov. 1, 1914 in Washington. Capital stock: com. \$15,000; bonds \$25,000.

Frank Fritsch, P.; D. G. McIntyre, V. P. & G. M.; S. S. McIntyre, Sc. & T.

Works at Sedro-Woolley: blt. 1913; f. o. June 14, 1913; one 1-ton Tropenas converter; one 1,750-lb. Rennerfelt electric fur. added 1918; two cupolas. Gray iron foundry. Machine shop.

Product: steel castings for sale for machinery purposes, annual cap., 1,400 tons; gray iron castings, annual cap., 2,500 tons.

SLATINGTON IRON & STEEL CO., Woolworth Bldg., New York, N. Y.

Inc. Nov. 28, 1916 in Pennsylvania. Capital stock: com. auth. \$200,000, issued \$125,000.

Robert Grant, P.; C. H. Thompson, Sc. & A.; John L. Watts, T.; at Woolworth Bldg., New York. W. L. Orton, V. P. & G. M.; Walter Schall, G. S.; at Slatington, Pa.

Selling agent: Robert Grant, Woolworth Bldg., New York.

Works at Slatington, Pa.: blt. 1890; 6 single puddling fur.; 1 rotary squeezer; three 3-d. heat. fur.; 20" 3-h. 1-st. muck; 16" 2-h. 2-st., 10" 3-h. and 2-h. 5-st. bar mills. Fuel, bit. coal. (Formerly owned by Edwin German; acquired by Iron Products Co., Phila, August 24, 1916; acquired by Slatington Iron & Steel Co., Dec., 1916.)

Product: merchant bar iron and steel, annual cap., 4,500 tons muck bar, 6,500 tons rolled products.

SLIGO FURNACE CO., 915 Olive St., St. Louis, Mo.

Inc. in Missouri. Capital stock: com. \$100,000.

C. L. Rogers, P.; H. H. Douglass, Sc. & A.; at 915 Olive St., St. Louis. N. A. Doyle, V. P.; C. D. Eaton, V. P.; S. S. Delano, T.; W. E. Hedgcock, P. A.; at 165 Broadway, New York. F. K. Jones, G. S.; at Sligo, Dent Co., Mo.

Sligo Furnace, Sligo, Mo.: 1 stack, 65' x 11'; blt. 1880, rebt. 1891, relined 1919; 2 Foote stoves; 2 steam blowing eng.; 3 water-tube boilers, 750 H. P. Charcoal: local and Michigan hematite ore. Company owns 67 charcoal kilns at Sligo, Mo., annual cap. 2,000,000 bushels of charcoal.

Product: warm blast charcoal pig iron, No. 5 to A A Scotch; annual cap., 20,000 tons.

SLIGO IRON & STEEL CO., 42 Broadway, New York, N. Y.

Inc. 1916 in Delaware. Capital stock: com. auth. 250,000 shares, no par value; issued 122,000 shares.

W. W. Darley, P.; F. L. Watson, V. P. & T.; E. C. Malmberg, Sc.; at 42 Broadway, New York. P. T. Duffy, V. P.; at Connellsville, Pa.

Sligo Rolling Mills, Connellsville: rebt. 1903; 19 single puddling fur.; squeezer; six 4-d. heat. fur.; 1 open annealing fur.; 20" 3-h.

2-st. muck; 16" 3-h. 1-st. roughing, 16" 3-h. 1-st. and 16" 2-h. 1-st. finishing, 16" 2-h. 1-st. bull head; 12" 3-h. 1-st. roughing, 9" 3-h. 3-st. and 9" 2-h. 1-st. guide; plate mill with 24" x 66" 2-h. roughing and 24" x 60" 3-h. finishing; 1 drop ham.; 1 shingling ham.; 2 forge fires. Fuel; coal. (Formerly owned by Charles Davidson, Connellsville; acquired by Sligo Iron & Steel Co. in March, 1917.)
 Product: iron and steel merchant bars, sheared plates and sheets; annual cap., 7,000 tons muck bar, 40,000 tons bars, 24,000 tons plates and sheets.

SLOSS-SHEFFIELD STEEL & IRON CO., American Trust Bldg., Birmingham, Ala.

Inc. 1899 in New Jersey. Capital stock: com. \$10,000,000; pref. 7% non-cum. auth. \$10,000,000, issued \$6,700,000; bonds \$2,000,000.

J. W. McQueen, P.; Hugh Morrow, V. P.; Russell Hunt, Sec. & T.; Hugh Franklin, A.; W. B. Dowell, P. A.

Sales offices:

Birmingham, L. Sevier, American Trust Bldg.

Boston, William J. Breen, 84 State Street.

Chicago, David Evans, 1061-2 McCormick Bldg.

Cincinnati, Domhoff & Joyce Co.

Glasgow, Scotland, Wm. Jacks & Co., 19 St. Vincent Place.

El Paso, Texas, The Evans Sales Co., 329 First National Bank Bldg.

Los Angeles, Spreckles Bros. Commercial Co., 200 Citizens National Bank Bldg.

New York, Debevoise-Anderson Co., 56 Liberty St.

Philadelphia, F. D. Dimmick, 2025 Land Title Bldg.

Portland, Ore., Rolph, Mills & Co., 401 Spaulding Bldg.

St. Louis, J. B. Fisher, 1325 Central National Bank Bldg.

San Francisco, Rolph, Mills & Co., 149 California St.

Seattle, Rolph, Mills & Co., Colman Bldg.

Brands: "Sloss" "Noala."

Product: foundry and forge pig iron.

City Furnaces, Birmingham, Ala.: 2 stacks, 82' 6" x 18'; No. 1, blt. 1881-2, last rebt. 1913-14, relined 1917; No. 2, blt. 1882, last rebt. 1906, relined 1916; twelve 4-pass stoves (four 85' x 20' 9", eight 74' x 20'); 7 steam blowing eng. (100,000 cfm.); 12 water-tube boilers, 4,800 H. P. Coke: local red and brown hematite ore. Product: foundry and forge pig iron; annual cap., 180,000 tons.

North Birmingham Furnaces, North Birmingham, Ala.: 2 stacks; No. 3, 73' x 17' 6", blt. 1887-88, rebt. 1901, relined 1917; No. 4, 82' 6" x 17' 6", blt. 1887-89, rebt. 1919; eight 4-pass stoves (six 80' x 20', two 75' x 20'), three Gordon stoves, 65' x 18'; 7 steam blowing eng. (100,000 cfm.); 11 water-tube boilers, 3,200 H. P.; 5 flue boilers, 600 H. P. Coke: local red and brown hematite ores. Product: foundry and forge pig iron; annual cap., 180,000 tons.

Philadelphia Furnace, Florence, Ala.: 1 stack, 75' x 17', blt. 1887-91, rebt. 1906, relined 1917; five 4-pass Whitwell stoves (70' x 20'); 4 steam blowing eng. (63,000 cfm.); 7 water-tube boilers, 2,000 H. P. Coke: local brown ore and red ore from Birmingham. Product: foundry and forge pig iron; annual cap., 85,000 tons.

Hattie Ensley Furnace, Sheffield, Ala.: 2 stacks; No. 1, 75' x 17', blt. 1887, rebt. 1900, relined 1914; No. 2, 80' x 17' 6", blt. 1916; five 4-pass stoves (three 70' x 20', two 65' x 18'); 4 steam blowing eng. (85,000 cfm.); 9 water-tube boilers, 1,965 H. P. Coke: local brown ore and red ore from Birmingham. Product: foundry and forge pig iron; annual cap., 183,500 tons.

Total annual cap., of blast furnaces, 628,500 tons.

COAL LANDS, COKE OVENS, IRON ORE LANDS, ETC.

The Sloss-Sheffield Steel & Iron Co. owns and operates coal mines at Brookside, New Found, Cardiff, Crocker Hollow, Flat Top, Bessie, Drifton, Ivy, America and Blossburg and coke ovens as follows:

Number	Location	Net Tons
281	Birmingham, Ala.....	152,880 annual cap.
99	Brookside, Ala.....	54,288 " "
87	New Found (Brookside) Ala.....	51,896 " "
350	Blossburg, Ala.....	191,100 " "
200	Flat Top, Ala.....	109,200 " "
200	Dora, Ala. (Ivy).....	91,000 " "
1217	Beehive coke ovens with.....	650,364 " "

The Sloss-Sheffield Steel & Iron Co. owns 8,916 acres of red fossiliferous ore lands in Etowah, Blount, Jefferson, and St. Clair Counties; 32,003 acres of brown hematite ore lands in Bibb, Blount, Chilton, Colbert, Franklin, Shelby and Tuscaloosa Counties, and 62,516 acres of coal lands in Blount, Fayette, Jefferson, Marion and Walker Counties.

The Sloss-Sheffield Steel & Iron Co. operates red ore mines at Irondale and Sloss in Jefferson County with an annual cap., of 437,500 tons of ore and brown ore mines at Russellville, Franklin County, with an annual cap. of 350,000 tons of ore.

SMELTERS STEEL COMPANY, 1010 Securities Bldg., Seattle, Wash.

Works at Commercial Waterway, Slip No. 7, Seattle: blt. 1919; electric fur. for manufacture of pig iron from ore.

SMITH (George H.) STEEL CASTING CO., 500 Clinton St., Milwaukee, Wis.

Inc. Oct. 15, 1901 in Wisconsin. Capital stock: com. \$50,000.

E. P. Smith, P.; Charles Peiffer, V. P.; F. E. Hinners, Sc. & T.

Sales office: Chicago, J. B. Marshall, 1657 Conway Bldg.

Works at 500-Clinton St., Milwaukee: blt. 1897; 3 modified Tropenas

converters (2-ton); 1 A. O. H. fur. (2-ton) installed 1917; 2 cupolas. Fuel, coke and oil. Crucible fur. dismantled.

Product: steel castings for sale for general and electrical machinery, automobiles, etc.; annual cap., 8,400 tons (6,000 converter, 2,400 tons acid open hearth).

Solomon, Max, Pittsburgh, Pa., see 1916 Directory, p. 299, rolling mill at Wheatland, Pa. sold to New Process Iron & Steel Co., Noblesville, Ind., Sept. 2, 1919; last named company plan to remove machinery to Noblesville.

SOUTHEASTERN IRON CORPORATION, 122 South Michigan Ave., Chicago, Ill.

Inc. May 21, 1917 in Virginia. Capital stock; com. \$500,000.

E. P. Seip, P.; F. H. Hardy, V. P.; C. D. Tripp, V. P.; H. A. Brassert, V. P.; A. B. Markus, Sc.; T. F. Miller, T.; at Chicago. J. H. B. Burke, G. S.; at Goshen, Va.

Sales agent: Pickands, Brown & Co., Chicago.

Victoria Furnace, Goshen, Va.: 1 stack, 74' 6" x 11' 8", blt. 1882-83, last rebt. 1902, remodeled 1917; 5 stoves (one 70' x 18', three 63' x 25', one 59' x 18'); 3 steam blowing eng. (36,000 cfm.); 6 water-tube boilers, 2,400 H. P. New River coke: foreign and domestic manganese ore and Lake ore. Own limestone quarry at Bells Valley, Va., annual cap., 75,000 tons. (Formerly owned by Goshen Iron Co.; acquired by Southeastern Iron Corp. in June, 1917.)

Product: foundry pig iron, spiegeleisen and ferro-manganese, annual cap., 72,000 tons pig iron or 30,000 tons ferro-alloys.

SOUTHERN CALIFORNIA IRON & STEEL CO., 4th & Mateo Sts., Los Angeles, Cal.

Inc. Nov. 25, 1901 in California. Capital stock: com. auth. \$1,500,000, issued \$712,500; bonds \$130,000.

A. C. Denman, Jr., P. & G. M.; E. G. Pratt, V. P.; A. W. Grier, Sc. & T.; T. K. McClelland, A.; G. B. Stephens, G. S.; G. H. Pettengill, P. A.

Selling agent: San Francisco, G. B. Merritt, 512-523 Rialto Bldg. Works at 4th & Mateo Sts., Los Angeles: blt. 1893-94, first steel made April 10, 1915; 2 B. O. H. fur. (30-ton); 1 cont. ingot heat. fur.; 2 heat. fur. (one 5-d., one 6-d.); 20" 3-h. 3-st. billet, 14" 3-h. 1-st. roughing and 9" 3-h. 5-st. guide; 3 pickling tanks; 1 galvanizing pot. Bolt and nut factory, blt. 1906; make bolts and rivets $\frac{1}{2}$ " to 3", nuts $\frac{1}{2}$ " to 2".

Product: steel ingots for own use, annual cap., 28,000 tons; merchant bar steel for sale and bolt, nut and rivet rods for own use, annual cap., 23,000 tons; bolts (5,000 tons), rivets (3,000 tons), nuts (2,000 tons) and washers (400 tons).

Company commenced construction Dec. 1, 1919, of a new plant at Huntington Park, Cal., to which equipment of present plant will

be removed in 1920; also adding one 6-ton Heroult electric fur.; annual cap., 5,000 tons; 16" 3-h. 2-st. and 12" 3-h. 6-st. bar mills.

SOUTHERN ELECTRO STEEL CO., Inc., Scott Bldg., Lynchburg, Va.

Building gray iron and steel foundry (electric furnace) and machine shop to be completed about July 1, 1920.

Product: gray iron and steel castings for jobbing trade and for own use in manufacture of lawn mowers.

SOUTHERN FERRO ALLOYS CO., Chestnut & 21st Sts., Chattanooga, Tenn.

Inc. 1917 in Tennessee. Capital stock: com. \$120,000; pref. \$90,000.

P. J. Kruesi, P. & G. S. M.; N. Thayer Montague, V. P. & T.; George L. Davison, V. P. & G. M.; Theodore L. Montague, Sc.

Sales agents: Shawinigan Products Co., 165 Fifth Ave., New York and 549 McCormick Bldg., Chicago.

Works at Chattanooga: blt. 1917, first ferro alloys made 1917; 5 electric fur. Electric power from Tennessee Power Co. (Premises formerly owned by Southern Steel Works; acquired by Southern Ferro Alloys Co., April, 1917.)

Product: ferro silicon (10% to 90%) and high-silicon pig iron, annual cap., 4,000 tons 50% ferro-silicon and 10,000 tons silvery iron.

Southern Iron & Commission Co. (lessee), Birmingham, Ala., see 1916 Directory, p. 300. The Eclipse Rolling Mill at East Birmingham, Ala., was sold to M. J. Gerson, Birmingham, Ala., May 1, 1918. It was operated as the Gerson Rolling Mill from Aug. 19, 1918 to November 10, 1918 when it was leased to B. A. Schroeder. B. A. Schroeder operated it under the name of the Liberty Manufacturing Co., from Nov. 11, 1918 to Dec. 15, 1918, when the lease was given up. See Gerson Rolling Mill.

SOUTHERN MANGANESE CORPORATION, Anniston, Ala.

Inc. Mar., 1917 in Alabama. Capital stock: com. \$50,000; pref. 8% cum. auth. \$25,000, none issued.

Theodore Swann, P.; at 807 Brown-Marx Bldg., Birmingham, Ala.

C. M. Jespersen, Sc. & T.; E. T. Hall, A.; B. G. Klugh, G. M.;

E. D. Smith, P. A.; at Anniston, Ala.

Sales agents: Rogers, Brown & Co., at Boston, Chicago, Cincinnati, Cleveland, New York, Philadelphia, Pittsburgh and St. Louis.

Works at Anniston: 8 rectangular, 3 phase, straight line electrode type electric fur.; first ferro-alloys made March, 1917. Electric power from Alabama Power Co.

Product: ferro-manganese, silico-manganese, ferro-silicon (50% and 75% grades), ferro-phosphorus, ferro-chrome and other alloys, annual cap., 20,000 tons.

SOUTHERN PACIFIC COMPANY, 65 Market St., San Francisco, Cal.

George McCormick, Gen. Supt. Motive Power.

Rolling Mill at Sacramento, Cal.: blt. 1881; 8 reverb. heat. fur. (two 2-d., six 3-d.); two 18" 3-h. 3-st. bar; two 12" 3-h. 3-st. bar mills; 1 steam hammer (6,000-lb.). Fuel, oil. Machine shop for own use. Gray iron foundry. Steel foundry; one 6-ton Heroult electric fur. added in 1920. Bolt and nut department.

Product: scrap bars, merchant bars, bolt and nut rods, angle bars, tie plate iron; track nuts; track, locomotive, stay and crown and common bolts; forged billets and slabs, car and locomotive forgings; annual cap., scrap bar, 12,200 tons; merchant bars and other hot-rolled products, 26,000 tons; bolts and nuts 22,700 kegs, forged products 7,350 tons; steel ingots and castings for own use, annual cap., 5,000 tons.

Southern Steel Works, Chattanooga, Tenn., see 1916 Directory, p. 301, acquired by Southern Ferro Alloys Company, April, 1917. Converter dismantled 1917.

SPANG, CHALFANT & CO., 2005 Union Bank Bldg., Pittsburgh, Pa.
Inc. July 3, 1899 in Pennsylvania. Capital stock: com. auth. \$2,000,000, issued \$1,756,000.

Henry Chalfant, P.; George Matheson, Jr., V. P., T. & G. M.; George E. Crates, Sc.; R. D. Morris, G. S. M.; at Pittsburgh. W. J. Hampton, G. S.; John A. Herman, P. A.; at Sharpsburg, Pa.

Sales offices: Chicago, 1922 McCormick Bldg.; St. Louis, 1706 Boatmans Bank Bldg.

Brand: "Etna."

Etna Iron & Tube Works, Etna, Pa.: blt. 1828; 4 trains (16" and 12" skelp). Product: skelp for own use, annual cap., 90,000 tons. Charcoal forge abandoned in 1913. Tube dept.: 2 butt-weld and 5 lap-weld fur. Fuel, nat. and prod. gas and coal. Two galvanizing pots for galvanizing pipe.

Product: pipe, $\frac{1}{8}$ " to 24", tubes $1\frac{1}{2}$ " to 13", annual cap., 200,000 tons black pipe, 24,000 tons galvanized pipe, 7,000 tons boiler tubes.

SPENCER HEATER CO., 1520 Albright Ave., Scranton, Pa.

Inc. Sept. 1, 1903 in Pennsylvania. Capital stock: com. auth. \$1,000,000, issued \$469,550; pref. 7% cum. auth. \$1,000,000, issued \$691,385.

David Boies, P. & G. M.; M. B. Fuller, V. P.; J. J. Belden, Sc. & T.; Vesty J. Stern, A.; William C. McKeown, G. S. & P. A.; F. H. Gaylord, G. S. M.

Sales offices:

Boston, J. J. Gillett, 136 Federal St.

Buffalo, C. P. Wadley, 601 White St.

Chicago, J. H. Montgomery, Railway Exchange Bldg.

Denver, J. H. Daly, 230 Fifteenth St.

Detroit, J. Degan, Ford Bldg.

New York, E. R. Troxell, 101 Park Ave.

Philadelphia, M. C. Gillett, Otis Bldg.

Providence, F. H. Olmsted, 32 Westminster St.

Works at Scranton, Pa.: one 3-ton Heroult electric fur. added 1919, f. o. Mar. 26, 1919; 2 cupolas; gray iron foundry.

Product: electric steel castings for own use and for sale, up to 2,000-lb.; gray iron castings; annual cap., 2,000 tons steel castings, 2,800 tons gray iron castings. Steam and hot water boilers.

Spencer Wire Company, Worcester, Mass., see 1916 Directory, p. 301, merged in Clinton-Wright Wire Co., Sept. 15, 1919.

Spring City Bloom Works, Spring City, Pa., see 1916 Directory, p. 302, acquired by the Parkesburg Iron Company, December 11, 1916.

SPRING VALLEY IRON & ORE CO., Spring Valley, Wis.

Inc. 1904 in Wisconsin. Capital stock: com. \$125,000.

Frederick H. Foote, P. & T.; George C. Foote, V. P.; at Port Henry, N. Y. Wallace P. Foote, Sc.; at Champaign, Ill.

Spring Valley Furnace, Spring Valley, Wis.: 1 stack, 66' x 13' 6", blt. 1892-93, remod. 1905; three 2-pass Siemens hot-blast stoves, 63' x 17'; steam blowing eng. (16,000 cfm.). Coke: local brown hematite ore. Company owns Cady Creek iron ore mine at Spring Valley. Charcoal kilns (idle). *Furnace last active in 1910.*

Product: malleable, bessemer and foundry pig iron, annual cap., 35,000 tons.

STANDARD BRAKE SHOE AND FOUNDRY CO., P. O. Box 652, Pine Bluff, Ark.

Not incorporated. F. L. Dilley, G. M.

Works at Pine Bluff, Ark.: Plan to install one 4,000-lb. Greene electric fur. in June, 1920, annual cap., 3,000 tons steel castings for own use and for sale.

Standard Chain Co., Pittsburgh, Pa., see 1916 Directory, p. 302, was sold to the American Chain Co., Inc., Jan. 1, 1917.

STANDARD CHEMICAL CO., Vanadium Bldg., Pittsburgh, Pa.

Inc. 1911 in Delaware. Capital stock: com. \$500,000.

James C. Gray, P.; A. R. Raymer, V. P.; Charles H. Viol, Sc.; H. A. Kræling, T.; G. V. Kappel, A.; E. T. Stevenson, P. A.; at Pittsburgh. L. F. Vogt, Works M.; at Canonsburg, Pa. John I. Mullen, S. Mines; at Naturita, Col.

Sales agents: Radium Chemical Co. and Standard Alloys Co., Vanadium Bldg., Pittsburgh.

Works at Canonsburg, Pa.: f. o. commercially in 1916.

Product: radium, ferro-uranium and ferro-vanadium, annual cap., 200 tons ferro-alloys.

STANDARD CRUCIBLE STEEL CASTING CO., 717 Thirtieth St., Milwaukee, Wis.

Inc. Aug. 10, 1910 in Wisconsin. Capital stock: \$25,000.

Frank P. Blumenfeld, P.; Henry M. Koosch, V. P. & T.; George F. Birkel, Sc., G. M. & P. A.

Works at 717-723 30th St., Milwaukee: blt. 1910, f. o. Aug. 12, 1910; one 5-ton A. O. H. fur.; first open hearth steel, Mar. 2, 1916. Fuel, crude oil. Crucible steel fur. dismantled in 1917.

Product: open hearth steel castings 1 oz. to 3,000-lb., for sale, annual cap., 2,500 tons.

STANDARD HORSESHOE CO., 131 State St., Boston, Mass.

Inc. 1890 in Massachusetts. Capital stock: com. \$100,000.

Roland H. Boutwell, P.; Roswell M. Boutwell, V. P. & T.; George S. Boutwell, Sc.; W. F. Hall, A.; at Boston. Roswell M. Boutwell, Jr., G. S.; at South Wareham, Mass.

Works at South Wareham, Mass.: 3 heat. fur. (two 2-d., one 3-d.); 4 reheat. fur. (3-d.); 18" 2-h. 2-st. breakdown, 9" 3-h. 4-st. finishing bar mill; 8 punching, 2 grubbing, and 4 bending machines, 4 presses. Machine shop for own use.

Product: horseshoe bars for own use, annual cap., 6,000 tons; horse and mule shoes.

STANDARD IRON CO., Ltd., 20 St. Nicholas St., Montreal, P. Q., Canada.

Inc. Feb. 13, 1912 in Dominion of Canada. Capital stock: com. \$150,000; pref. 7% cum. \$150,000.

Robert J. Mercur, P.; S. F. Belknap, Sc.; at Montreal. F. H. Hardy, V. P.; at Peoples Gas Bldg., Chicago, Ill.

Sales agent: R. J. Mercur & Co., Ltd., 20 St. Nicholas St., Montreal. Deseronto Furnace, Deseronto, Ont.: 1 stack, 61' x 12', blt. 1898, last rebt. 1912, relined 1918; warm blast, two iron pipe stoves; 1 steam blowing eng. (5,000 cfm.); 4 flue boilers, 700 H. P. Charcoal: imported Lake and local ore.

Product: malleable and car wheel pig iron, annual cap., 20,000 tons. Parry Sound Furnace formerly owned by this company was sold August, 1918, to Parry Sound Iron Co.

Standard Iron Co., Goodrich, Tenn., see 1916 Directory, p. 303; acquired by Bon Air Coal & Iron Corporation in Dec., 1919.

STANDARD PROCESS STEEL CORPORATION, North Broad St., Phillipsburg, N. J.

Inc. July 24, 1916 in New Jersey. Capital stock: com. \$200,000; pref. 7% cum. auth. \$300,000, issued \$243,700.

O. L. Mills, P. & G. M.; M. J. Fry, V. P.; George W. Bowen, Sc. & G. S. M.; Samuel Bonow, T. & A.; John Williams, G. S.; Thomas H. Spragle, P. A.

Works at North Broad St., Phillipsburg: one 10-ton A. O. H. fur.;

2 cupolas. Gray iron foundry (annual cap., 450 tons). (Formerly owned by Rowland Firth & Son Co., Nicholas Gibney, Trustee for bondholders; acquired by Standard Process Steel Corp., Nov. 6, 1916.)

Product: acid open hearth steel castings for sale, annual cap., 3,000 tons; hardened steel gears, pinions, sprockets, spindles, coupling boxes, etc.

STANDARD SEAMLESS TUBE CO., 313 Sixth Ave., Pittsburgh, Pa.
Inc. Sept. 8, 1913 in Pennsylvania. Capital stock: com. \$2,000,000.
H. C. Fownes, P.; W. C. Fownes, V. P.; T. H. McGraw, Jr., Sec.; W. C. Fownes, Jr., T.; W. E. Motheral, P. A.; T. L. Kirk, M. Tube Sales; R. W. Anderson, M. Steel Sales; at Pittsburgh, C. R. Barton, G. S.; F. Hoving, Works M.; at Ambridge, Pa.

Works at Economy, Pa.: 3 B. O. H. fur. (two 25-ton, one 40-ton); one 15-ton Heroult electric fur.; one 4-hole soaking pit; 4 gas prod.; 2 cont. heat. fur.; 25" 3-h. 5-st. bar mill. Hot and cold units for seamless tubes.

Product: steel ingots for own use, annual cap., 54,000 tons (40,000 tons open hearth, 14,000 tons electric); 45,000 tons billets, 20,000 net tons hot rolled and cold drawn seamless tubes.

STANDARD STEEL CASTINGS CO. (The), Cleveland, Ohio.

Inc. Dec., 1912 in Ohio. Capital stock: com. auth. \$1,000,000, issued \$695,000.

F. B. Whitlock, P.; E. H. Janes, V. P. & G. S. M.; C. B. Fletcher, Sec., T. & G. M.; A. B. Abbott, A.; Jules Matthews, G. S.

Sales offices: Chicago, R. T. Middleton, 910 South Michigan Ave.; Cleveland, J. F. Janes.

Cleveland Plant, 3311 West 73rd St., Cleveland: two 4,000-lb. Tropenas converters, 1 cupola. Fuel, coke and nat. gas.

Product: steel castings for sale, motor truck and tractor castings, misc. small castings, annual cap., 3,400 tons.

Clearing Plant, 5939 West 66th St., Chicago, Ill.: blt. 1917-18; two 6-ton Snyder electric fur., first steel made Mar. 18, 1918.

Product: electric steel castings for sale and for own use in manufacture of motor truck wheels; motor truck and tractor castings, annual cap., 10,000 tons.

Standard Steel Co., Montreal, Canada, see 1916 Directory, p. 304.

In 1915 Standard Steel Co., a subsidiary of Canadian Steel Foundries Co., leased for the duration of the War the plant owned and formerly operated by the Belgo-Canadian Steel Co., Ltd. The Baillot converter was dismantled in 1915, and 2 A. O. H. fur. (10-ton and 15-ton) built in 1915, f. o. Jan. 1, 1916, annual cap., 15,000 tons ingots for munitions. Operations ceased when the armistice was signed, plant was dismantled, and lease given up July 1, 1919. Standard Steel Co. no longer in existence.

STANDARD STEEL WORKS CO., 500 North Broad St., Philadelphia, Pa.

Inc. Dec. 23, 1907 in Pennsylvania. Capital stock: \$3,000,000; bonds \$5,000,000.

S. M. Vauclain, P.; Robert Radford, V. P. & T.; W. H. Pugh, Jr., Sc.

Sales offices:

Chicago, Railway Exchange Bldg.

New York, 120 Broadway.

Richmond, Va., Traveller Bldg.

St. Louis, Boatmens Bank Bldg.

San Francisco, Claus Spreckles Bldg.

Works at Burnham, Pa.: open-hearth fur.; heat. fur.; hammers; hydraulic presses; tire mills, wheel rolling mills.

Product: steel tires, steel-tired wheels, rolled steel wheels, steel railway springs, pipe flanges, and crusher rings; iron and steel castings and forgings.

STANDARD STOKER CO., Erie, Pa.

One 2-ton Heroult electric fur. f. o. Nov. 26, 1919, annual cap., 3,600 tons steel castings for own use only.

STANDARD TIN PLATE CO. (The), Canonsburg, Pa.

Inc. 1902 in Pennsylvania. Capital stock: com. \$500,000.

Louis Follet, P., G. M. & G. S. M.; W. J. Reese, Sc. & T.; A. D. O'Brien, M.

Works at Canonsburg: blt. 1902-03; f. o. Mar., 1904; 23 hot tin mills (29" x 30" to 29" x 34"); 23 sheet and 23 pair fur.; 16 cold mills (24" x 40" and 24" x 42"); nine 2-d. box annealing fur.; 4 Mesta 3-arm pickling mach.; 42 tinning sets for coke tinplates. Fuel, powdered coal.

Product and annual cap.: black plates for tinning, 87,500 tons; tinplates, 1,750,000 base boxes.

STANLEY WORKS (The), 195 Lake St., New Britain, Conn.

Inc. 1901 in Connecticut. Capital stock: com. \$2,500,000.

George P. Hart, Ch.; E. A. Moore, P.; C. F. Bennett, V. P. & G. S. M.; Walter H. Hart, 2 V. P. & G. S.; E. W. Christ, Sc. & P. A.; L. W. Young, T.

Sales offices: Chicago, E. R. Swift, M., 73 East Lake St.; New York, A. E. Duncan, M., 100 Lafayette St.

Product: builders' hardware, cold rolled strip steel, wrought steel specialties, box strapping and fasteners for containers.

The company operates steel works and hardware plant at New Britain, Conn.; hardware plant at Niles, Ohio; also hot rolling mill at Bridgewater, Mass.

New Britain Works, New Britain, Conn.: one 25-ton B. O. H. fur. added 1918, f. o. June, 1918; 2 cont. heat. fur.; 4 gas prod.; 20" 3-h. 1-st. billet mill; hoop mill with 12" 2-h. 6-st. and 10" 3-h. 5-st.;

first hot rolled products, Dec., 1918; 40 mills for rolling cold rolled strip; 10 box annealing fur.; 5 pickling mach.; 11 pickling tanks; Washer dept for wrought steel punched washers up to $4\frac{1}{2}$ " x $2\frac{1}{8}$ ". Product and annual cap.: 15,000 tons ingots, 12,000 tons hoops and bands, 37,000 kegs washers.

Bridgewater Works: est. 1785; 1 cont. heat. fur.; 3 gas prod.; 18" 3-h. 3-st. band, 14" 3-h. 3-st. band, 14" 3-h. 4-st. tack mill. Fuel, coal and prod. gas. Product and annual cap.: 35,000 tons steel hoop, bands and tack plate for own use in New Britain Works.

STAR FURNACE CO., Jackson, Ohio.

Inc. Nov. 29, 1865 in Ohio. Capital stock: com. \$60,000; pref. 7% cum. \$100,000.

Lewis V. Brown, P.; at Athens, Ohio. Charles O. Brown, Sc., T., G. M. & G. S. M.; Homer E. Davis, A.; Walter T. Brown, A. M.; Jacob Mapes, S.; at Jackson.

Sales agents: Rogers, Brown & Co.

Brand: "Star."

Star Furnace at Jackson: 1 stack, 70' x 16' 6", blt. 1866, last rebt. 1912-13; 4 Foote stoves (two 75' x 18', two 75' x 16'); 2 steam blowing eng. (37,000 cfm.); 12 tubular boilers, 1,500 H. P. Raw coal and coke: local and Lake ore. Limestone quarry at Eifort, Ohio, annual cap., 40,000 tons.

Product: bessemer ferro-silicon, Jackson County high silicon silveries. Annual cap., 30,000 tons ferro-silicon or 60,000 tons foundry pig iron.

STARR MFG. CO., Ltd. (The), Dartmouth, Nova Scotia, Canada.

Inc. 1868 in Nova Scotia. Capital stock: com. auth. \$500,000, issued \$398,000; pref. auth. \$500,000, issued \$398,000.

Hon. George E. Faulkner, P.; at 102 Hollis St., Halifax. E. D. Adams, V. P.; at 51 Inglis St., Halifax. H. Goudge, Sc. & G. M.; at Dartmouth.

Works at Dartmouth: blt. and f. o. 1896; three 3-d. heat. fur., 1 busheling fur.; 18" 2-h. and 10" 3-h. mills; 1 hammer. Fuel, coal.

Product: merchant bar in rounds, squares and flats, annual cap., 2,500 tons; skates; bolts, nuts, rivets, railway and ship spikes; carriage axles; iron and steel forgings.

State National Bank of St. Louis, St. Louis, Mo., see 1916 Directory, p. 306. Missouri Furnace sold to Mississippi Valley Iron Co., March, 1916.

STEARNS-ROGER MANUFACTURING CO. (The), 1720 California St., Denver, Col.

Inc. 1891 in Colorado. Capital stock: com. \$500,000.

T. B. Stearns, P.; A. B. Kennedy, V. P.; C. A. Leland, Sc.; R. W. Gordon, G. S. M.; J. H. Burk, P. A.

Works at Pueblo, Col.: one 1,500-lb. Snyder electric fur. added 1917,

f. o. Jan., 1918. Foundry for gray iron, semi-steel, brass, bronze and aluminum castings. Machine shop, sheet metal shop, forging and pattern shops.

Product: electric steel castings for sale and for own use, 1-lb. to 1,000-lb.; annual cap., 450 tons. Gray iron and semi-steel castings, 2,000 tons.

STEEL & TUBE CO. OF AMERICA (The), 2111 Conway Bldg., Chicago, Ill.

Inc. June 14, 1918 in Delaware. Capital stock: com. auth. \$25,000,000, issued \$1,941,884; pref. 7% cum. \$17,500,000; bonds \$13,240,000.

Clayton Mark, Ch.; Anson Mark, V. P.; Clarence Mark, V. P.; F. F. Corby, G. S. M.; at 2111 Conway Bldg. Ferdinand Schlesinger, Ch. Ex. Com.; A. A. Schlesinger, P. & T.; M. T. MacLaren, V. P.; H. J. Schlesinger, V. P.; E. G. Wilmer, V. P.; at First National Bank Bldg., Milwaukee. C. T. Boynton, V. P.; C. P. Wheeler, V. P.; C. D. Caldwell, Sc.; at McCormick Bldg., Chicago. A. H. Beale, G. S.; at Indiana Harbor, Ind.

Sales offices:

Kansas City, Mo., 1308 Commerce Bldg.

Los Angeles, Cal., 404 Security Bldg.

Minneapolis, Minn., 608 Andrus Bldg.

New Orleans, La., 807 Maison Blanche.

New York, 1348 Equitable Bldg.

Pittsburgh, Pa., 538 Oliver Bldg.

Product: bessemer, basic, malleable and foundry pig iron. Steel ingots, bessemer and open-hearth blooms, billets and slabs; universal plates, skelp, black and galvanized pipe, boiler tubes, etc.

Mark Works, Indiana Harbor, Ind.:

Blast Furnace: 1 stack, 92' x 22' 6"; blt. 1917-18, f. o. Aug. 24, 1918; three 2-pass stoves (100' x 22'); 2 turbo blowers (110,000 cfm.); 12 water-tube boilers, 7,200 H. P., serve also steel plant and rolling mills; 1 Pittsburgh Coal Washer Co. double-strand pig casting mach. By-product coke: Lake ore. Product: basic pig iron, annual cap., 200,000 tons.

By-product coke plant: 120 Semet-Solvay coke ovens, annual cap., 600,000 net tons coke. By-product recovery plant. Semet-Solvay benzol plant, annual cap., 2,225,000 gal. light oil.

Steel Plant: blt. 1916-18; 4 B. O. H. fur. (75-ton); 6 heat. fur. (five 4-d., 1 cont.); six 4-hole soaking pits; 35" 2-h. 1-st. blooming; 28" 2-h. 1-st. billet; 10" 2-h. 11-st. cont. mill; 42" universal plate mill, rolls 30" x 88" (convertible into sheared plate mill); 3 lap-weld fur. for pipe 2" to 20". Fuel, prod. gas and coal. (Formerly owned by the Mark Mfg. Co.; merged July, 1918 in Steel & Tube Co. of America). Product: steel ingots, slabs, blooms and billets, universal plates, skelp, and black pipe; annual cap., 225,000 tons

ingots, 600,000 tons slabs, blooms and billets, 180,000 tons universal plates, 180,000 tons skelp, 100,000 tons black pipe.

Building in 1920 a new Bessemer dept. at Indiana Harbor to replace that at Iroquois Plant (see below); new plant to consist of two 15-ton Bessemer converters, 3 cupolas, 600-ton mixer, annual cap., 360,000 tons ingots.

Iroquois Furnaces and Steel Works, South Chicago, Ill.:

Blast Furnaces: 5 stacks.

No.	Present Size	Built	Last Relined	No.	Kind	Stoves Size	First Blown in
1	76' x 18' 6"	1890-91	1919	4	Kennedy	85' x 18'	9/21/19
2	85' x 18' 6"	1900-01	1919	4	{ 2 Kennedy 2 McKee	93' 6" x 18' 93' 6" x 18'	{ 1/27/02
3	92' x 22' 6"	1910-12	1919		{ 3 Kennedy	96' x 22'	7/30/12
4	85' x 19' 6"	1910-12	1919	2	{ 8 Brassert	96' x 22'	5/13/12
5	92' x 22' 6"	1917-18	—	3	Brassert	100' x 22'	3/5/18

Six steam blowing eng. and 4 turbo blowers (293,000 cfm.); 30 water-tube boilers, 13,995 H. P.; 3 pig casting machines (2 Heyl and Patterson double-strand, 1 Pittsburgh Coal Washer Co. single-strand); 1 slag granulating pit, annual cap., 54,000 tons. Coke: Lake ore. Product: bessemer, basic, foundry and malleable pig iron, annual cap., 684,000 tons; ferro-silicon and ferro-manganese, 25,000 tons.

Steel Works: blt. 1916-17, f. o. Jan., 1917; one 15-ton Bessemer converter. (Formerly owned by the Iroquois Iron Co.; consolidated July, 1918 with Mark Mfg. Co. to form the Steel & Tube Co. of America). Product: steel ingots; annual cap., 275,000 tons.

Mayville Furnaces, Mayville, Wis.: 2 stacks; Furnace A, 80' x 17', blt. 1848, last rebuilt 1910, relined 1918; Furnace B, 85' x 18', blt. 1905-07, last rebt. 1919; 9 stoves, 2-pass (five 77' x 20', four 95' x 20'); 5 steam blowing eng. (155,000 cfm.); 12 water-tube boilers, 4,872 H. P.; 1 Uehling double-strand pig casting machine; 2 Greenawalt sintering plants, annual cap., 21,900 tons; one rotary kiln nodulizing plant, annual cap., 91,250 tons; 4 Grondal briquetting kilns, annual cap., 109,500 tons. By-product coke: Lake and Mayville ore. (Formerly owned by The Northwestern Iron Co.; acquired by Steel & Tube Co. of America July 1, 1919). Product: foundry, low and high-phosphorus malleable bessemer pig iron; annual cap., 200,000 tons.

Evanston Works, Evanston, Ill.: 2 butt-weld fur., 2 galv. pots.

Product: butt-welded pipe $\frac{1}{8}$ " to 3"; annual cap., 60,000 tons black pipe, 20,000 tons galvanized pipe.

Zanesville Plant, Zanesville, Ohio: 2 butt-weld fur.; 2 lap-weld fur., 1 galv. pot. Product: butt-weld pipe $\frac{1}{8}$ " to 3", lap-weld pipe 2" to 20", galvanized pipe; annual cap., 140,000 tons black pipe, 20,000 tons galvanized pipe, 10,000 tons boiler tubes.

ORE PROPERTIES, QUARRIES, COKE PLANTS, ETC.

The company owns the Mayville Mine, Dodge County, Wis., annual cap., 365,000 tons and leases the following mines: Newport Mine, Ironwood, Mich., annual cap., 900,000 tons; Bonnie Mine, Ironwood, Mich., annual cap., 300,000 tons; Palms Mine, Bessemer, Mich., annual cap., 600,000 tons; Keweenaw and Anvil Mines, Bessemer, Mich., annual cap., 660,000 tons. It also owns and operates 108 Otto-Hoffman by-product coke ovens at Mayville, Wis., annual cap., 338,000 net tons of coke; by-product recovery plant, annual cap., 2,737,500 lbs. ammonia, and 3,358,000 gal. tar. Benzol plant, annual cap., 1,375,000 gals. light oil. The company owns and operates a limestone quarry near Mayville, Wis., annual cap., 150,000 tons. The company also owns the plant of the Harrow Spring Co., Kalamazoo, Mich.

STEEL COMPANY OF CANADA, Ltd. (The), Hamilton, Ontario, Canada.

Inc. June 9, 1910 in Dominion of Canada. Capital stock: com. auth. \$15,000,000, issued \$11,500,000; pref. 7% cum. auth. \$10,000,000, issued \$6,496,300; bonds \$8,751,246.68.

Charles S. Wilcox, Ch.; Robert Hobson, P.; F. H. Whitton, V. P.; H. H. Champ, Sec. & T.; Corbett F. Whitton, A. Sec.; H. S. Alexander, A. T.; at Hamilton. R. H. McMaster, V. P.; at Montreal. Sales offices at Halifax, Hamilton, London (England), Montreal, New York, St. John, Toronto, Vancouver, Victoria, Winnipeg.

Product: pig iron, steel ingots, blooms, billets; sheet bars; scrap bar; iron and steel merchant bars, tie plates, fish plates, axles, forgings, horseshoes; black sheets; black and galvanized wrought pipe; nail plate, cut nails; wire rods, plain, tinned and galvanized wire, wire nails, tacks, wire goods, barbed wire, wire fencing, etc.; spikes, bolts, nuts, rivets and washers; wood and machine screws; drop forgings and carriage hardware. Coke and sulphate of ammonia. Hamilton Works, Hamilton, Ontario.

Blast Furnaces: 2 stacks; Furnace A, 72' 9" x 16', blt. 1894-95, f. o. Dec. 30, 1895; Furnace B, 80' x 19' 6", blt. 1906-07, f. o. Nov. 8, 1907; 8 stoves (3 McClure, 55' x 19'; 5 two-pass side comb., one 75' x 19', four 90' x 21'); 5 steam blowing eng. (72,000 cfm.); 12 water-tube boilers, 4,050 H. P. By-product coke: Lake ore. Product: basic, malleable and foundry pig iron, annual cap., 215,000 tons.

By-product coke plant: 80 Wilputte by-product ovens, annual cap., 400,000 net tons coke. By-product recovery plant.

Steel Works: blt. 1900; 11 B. O. H. fur. (two 25-ton two 45-ton, three 50-ton, four 70-ton); one 200-ton mixer; five 4-hole soaking pits; 2 cont. billet heat. fur.; 34" 2-h. 1-st. reversing blooming; cont. billet and sheet bar mill with 18" 2-h. 6-st. and two st. edging rolls; 12" to 10" 2-h. 17-st. cont. rod and bar mill; 14" 3-h. 3-st.

and 10" 3-h. 6-st. hand bar mills; 4 sheet mills (two 28" x 36", two 28" x 44"); two cold mills 22" x 48"; 3 box annealing fur. Spike shop. Product and annual cap.: 350,000 tons ingots; steel castings for own use; 325,000 tons blooms, billets and sheet bars; 152,000 tons hot rolled products including 100,000 tons wire rods, 40,000 tons merchant bars, bolt, nut and spike rods, light structural, shapes, agricultural implement shapes, etc.; 12,000 tons black sheets for galvanizing, stamping, forming, etc., and tack plate; 80,000 kegs railway spikes.

Ontario Works, Hamilton, Ontario: blt. 1861; 2 cont. billet heat. fur. for 20" mill; 5 heat. fur. for 9" and 10" mill and forge; 20" 3-h. 3-st. bar; 10" 3-h. 3-st. bar; 9" 3-h. 5-st. guide; 3 hammers (5-ton steam, 2-ton steam, 1 helve). Fish plate and tie plate shop. Shape forge and axle dept. Product: merchant steel bars, tie plates, fish plates, axles and heavy forgings; annual cap., 90,000 tons rolled product, 3,500 tons forged axles and shapes.

Belleville Works, Belleville, Ontario: blt. 1899-00: 4 busheling and 1 scrap fur.; 2 heat. fur. for 9" mill; 18" 3-h. 1-st. muck mill; 12" 3-h. 4-st. bar mill (idle); 9" 3-h. 4-st. bar; horseshoe dept.; spike shop. Product: scrap bar, iron and steel merchant bar, horseshoe bars, spike rods, horseshoes and spikes. Annual cap., 15,000 tons scrap bar; 12,000 tons merchant bar; 50,000 kegs horseshoes; 10,000 kegs pressed, ship, railway and skimming spikes.

Notre Dame Works, Montreal, P. Q.: blt. 1857; 1 busheling fur.; 1 squeezer; seven 4-d. and one 5-d. heat. fur.; 18" 3-h. 1-st. muck; 18" 3-h. 3-st. bar; 12" 3-h. 4-st. bar; 12" to 9" 3-h. 5-st. Belgian. Bolt and nut dept. Product: iron and steel merchant bars, horseshoe bars, nail and hinge plate, bolt, nut and rivet rods; cut nails, plain wire, wire nails; bolts, nuts and rivets, horseshoes, horse nails, tacks, staples, etc.; lead pipe, shot, putty and white lead. Annual cap.; 14,000 tons scrap bar; 36,000 tons merchant bars, 25,000 kegs cut nails; 30,000 net tons plain wire, 275,000 kegs wire nails; 7,000 net tons bolts, nuts and rivets; 5,500 net tons horseshoes.

St. Patrick Works, 104 St. Patrick St., Montreal: blt. 1859; 4 scrap heat. fur.; 18" 3-h. 3-st. muck and bar mill; 12" to 9" 3-h. 5-st. Belgian mill. Spike, bolt and rivet dept. Product: iron and steel merchant bars, tack and washer plate; annual cap., 25,000 tons rolled products, 7,500 net tons pressed, drift and railway spikes, track and heavy bolts, rivets, washers, etc.

St. Henry Works, 172 St. Ambroise St., Montreal: rebilt. 1906; 1 butt-weld fur. for pipe $\frac{1}{4}$ " to 4"; 4 gas prod. Fuel, prod. gas. Product: iron and steel pipe, black and galvanized; conduit, fence and signal pipe; couplings and nipples; annual cap., 25,000 tons.

Dominion Works, 75 St. Joseph St., Lachine: blt. and f. o. 1885. Product: plain and galvanized wire; copper and brass wire;

barbed wire, bale ties, wire nails, wire cable, field fence, fence gates, screws, cotters, hooks, etc. Annual cap., 25,000 tons wire, 100,000 kegs wire nails.

Canada Works, Hamilton, Ont.; orig. blt. 1887. Product: wire of all kinds, wire nails, staples, tacks, cold rivets, bolts, wood and machine screws, bright wire goods, annual cap., 32,000 tons wire, 300,000 kegs wire nails, 3,000 tons bolts, rivets and screws.

Western Wire & Nail Co. Works, London, Ont.; blt. 1897.

Product: wire nails, staples, barbed wire, braided clothes line, etc., annual cap., 36,000 kegs wire nails.

Brantford Works, Brantford, Ont. Product: machine, carriage, plow and tire bolts; cold square and hexagon nuts; hot and cold rivets; annual cap., 1,500 tons.

Gananoque (Upper) Works, Gananoque, Ont. Product: automobile, carriage and other drop forgings.

Gananoque (Lower) Works, Gananoque, Ont. Product: carriage and carriage top hardware, small automobile forgings, bow sockets and misc. small forgings.

Swansea Works, Toronto, Ont. Product: machine, carriage, tire, sleigh-shoe, plow, automobile and other heavy bolts, track bolts; hot and cold, square and hexagon nuts; bridge, boiler and cold rivets, annual cap., 13,000 tons bolts, nuts, rivets, etc.

STEPHENSON CHARCOAL IRON CO., Wells, Delta Co., Mich.

Inc. 1911 in Michigan. Capital stock: com. \$150,000.

M. J. Corbett, P.; at Binghamton, N. Y. W. E. Black, V. P.; R. E. McLean, Sec.; G. C. Craver, T.; J. H. Walker, S.; at Wells. Brand: "Schaffer Lake Superior."

Stephenson Furnace, Wells, Mich.: 1 stack, 60' x 10'; blt. 1911-12, relined 1919; 1 double Durham hot blast stove; 2 steam blowing eng. (700 cfm.); 6 tubular boilers, 800 H. P. Charcoal: Lake ore.

Product: charcoal pig iron, annual cap., 24,000 tons.

STERLING STEEL FOUNDRY CO., Braddock, Pa.

Inc. May 9, 1902 in Pennsylvania. Capital stock: com. auth. \$1,000,000, issued \$746,325.

George W. Smith, P. & G. M.; William Nease, V. P.; M. A. Quinn, Sec. & A.; H. G. Smith, T.; D. B. Webb, G. S.; G. J. Chandler, G. S. M.; G. C. Smith, P. A.

Sales agents: New York, Hubbard & Co., 81 Fulton St.; Philadelphia, T. W. Illingworth, Widener Bldg.; Seattle, W. H. Pierson. Works at Braddock: blt. 1902, f. o. Oct., 1902; two 25-ton A. O. H. fur.

Product: steel ingots and steel castings for sale, locomotive and car castings, stern frames for shipbuilding; annual cap., 24,000 tons (12,000 tons ingots, 12,000 tons castings).

STEWART IRON CO., Ltd., Sharon, Pa.

Org. 1877. Capital: \$150,000.

Harvey H. Brown, Ch.; George W. Nichols, Sc.; Fayette Brown, T.; at Rockefeller Bldg., Cleveland. Samuel McClure, G. M.; Charles F. Phillips, A. G. M.; at Sharon.

Sales office: 1335 Rockefeller Bldg., Cleveland, Ohio.

Brand: "Stewart."

Stewart Furnace, Sharon: 1 stack, 75' x 17', blt. 1872, last rebt. 1909, relined 1918; 4 Cowper-Kennedy stoves, 70' x 18'; 2 steam blowing eng. (30,000 cfm.); 7 water-tube boilers, 2,650 H. P. Conn. coke: Lake and foreign ore. Company owns and operates 60 beehive coke ovens in North Union, Fayette Co., Pa.

Product: bessemer and low-phosphorus pig iron, annual cap., 85,000 tons.

Stock Process Steel Co., Detroit, see 1916 Directory, p. 310, converter dismantled in 1916.

STOWELL CO. (The), South Milwaukee, Wis.

Inc. May 18, 1916 in Wisconsin. Capital stock: com. auth. \$200,000, issued \$150,310.

Fred W. Rogers, P.; Rupert A. Nourse, V. P. & G. M.; T. E. Ward, Sc., G. S. M. & P. A.; H. J. Van Beek, T.

Works at South Milwaukee: one 1½-ton Moore electric fur. added 1918, f. o. Dec. 10, 1918; one cupola. Gray iron, malleable iron and brass foundry. No. 2 plant at Milwaukee, malleable iron foundry.

Product: electric steel castings for sale and own use, annual cap., 1,200 tons. Gray iron (6,000 tons), malleable iron (12,000 tons) and brass (250 tons) castings. Link-belt chain; wood and steel tackle blocks; wagon and carriage malleables.

STROH STEEL HARDENING PROCESS CO., 804 Westinghouse Bldg., Pittsburgh, Pa.

Inc. 1911 in West Virginia. Capital stock: com. \$400,000.

W. Y. Stroh, P. & G. M.; J. L. Kendall, V. P.; C. W. Hays, Sc. & G. S. M.; A. R. Bassett, T.; S. M. Rose, A.; James Thompson, G. S.; J. L. Fuchs, P. A.

Sales agents: Portland, Oreg., M. C. Hickok, Henry Bldg.; San Francisco, G. F. Hickok 604 Hobart Bldg.; Salt Lake City, J. A. Foley, 221 Kearns Bldg.; Bethlehem, Pa., Bethlehem Foundry & Machine Co.

Lawrence Plant, 32nd St. & A. V. R. R., Pittsburgh: one 10-ton A. O. H. fur. blt. 1909, f. o. Jan. 29, 1910. Fuel, oil. (Formerly owned by Kennedy-Stroh Corp.; acquired by Stroh Steel Hardening Process Co., Mar. 1, 1916.)

Product: open hearth steel castings for sale, annual cap., 4,000 tons. Darlington Plant, Darlington, Pa.: formerly owned by Darlington Steel Casting Co.; acquired by Stroh Steel Hardening Process Co., May 27, 1916; destroyed by fire in 1917.

STRONG STEEL FOUNDRY CO., 33 Norris St., Buffalo, N. Y.

Inc. 1908 in New York. Capital stock: com. auth. \$200,000, issued \$154,000.

O. H. P. Champlin, P., T., G. M. & P. A.; A. A. Berrick, V. P.; J. E. Keller, Sc. & G. S. M.; H. S. Champlin, A.

Works at 33 Norris St., Buffalo: blt. 1912-13, f. o. Feb., 1913; one 15-ton A. O. H. fur. Crucible steel furnaces abandoned.

Product: acid open hearth steel castings from $\frac{1}{2}$ -lb. to 20,000-lb. for sale; annual cap., 7,200 tons.

STRUTHERS FURNACE CO. (The), 1106 Citizens' Bldg., Cleveland, Ohio.

Inc. June 2, 1896 in Ohio. Capital stock: com. \$1,000,000; pref. 7% cum. auth. \$1,250,000.

W. C. Runyon, P.; W. C. Runyon, Jr., V. P.; A. Grossman, Sc. & T.; E. H. Ridgway, P. A.; at Cleveland. L. S. Baldwin, S.; at Struthers, Ohio.

Anna Furnace, Struthers, Ohio: 1 stack, 83' x 20' 6", blt. 1869, last rebt. 1909; 5 stoves (four 70' x 18', one 100' x 22'); 4 steam blowing eng. (60,000 cfm.); 9 water-tube boilers, 3,462 H. P.; one Uehling single-strand casting mach. Coke: Lake ore. Company owns 200 beehive coke ovens at Fairbank, Pa., annual cap., 150,000 net tons. Building a slag crushing plant.

Product: basic, foundry and malleable pig iron, annual cap., 180,000 tons.

STURGES & BURN MANUFACTURING CO., Congress & Green Sts., Chicago, Ill.

Inc. Dec., 1900 in Illinois. Capital stock: com. \$200,000; pref. 6% cum. \$200,000.

Lee Sturges, P. & G. M.; William H. Burn, V. P. & Sc.; Frank Sturges, T.; A. M. Oliver, P. A.; at Chicago. A. R. Perry, Works M.; at Melrose Park, Ill.

Sales agent: W. S. Burn, 30 Church St., New York City.

Works at Bellwood, P. O. Melrose Park, Ill.: blt. 1912, f. o. Jan., 1913; 1 Mesta pickling mach.; one Morewood machine, one automatic machine; six dipping stacks for stamped ware.

Product: tinplates for own use; milk cans, creamery supplies, sheet metal products, etc.

SUPERIOR SHEET STEEL CO. (The), Canton, Ohio.

Building at Canton, Ohio, 8 mill sheet steel plant with hot rolls, cold rolls, annealing and galvanizing equipment for manufacture of black and galvanized sheets. To begin operations, June, 1920.

SUPERIOR STEEL CASTINGS CO., Benton Harbor, Mich.

Inc. June, 1916 in Michigan. Capital stock: com. \$150,000.

S. E. Doster, P.; W. R. Gilmore, V. P. & G. M.; at Benton Harbor. C. A. Pratt, Sc. & T.; at 4834 Halstead St., Chicago, Ill.

Sales offices: Chicago, 122 South Michigan Ave.; and at Benton Harbor.

Works at Benton Harbor, Mich.: blt. 1916, f. o. Nov., 1916; two 15-ton A. O. H. fur. Fuel, oil. Malleable iron foundry, annual cap., 9,000 tons, building, to be completed in August, 1920.

Product: steel castings for sale; manganese and vanadium alloy steel castings; mining, electrical and general machinery castings, railway car and locomotive castings, annual cap., 10,000 tons.

SUPERIOR STEEL CORPORATION, 529 Union Arcade Bldg., Pittsburgh, Pa.

Inc. Dec. 21, 1916 in Virginia. Capital stock: com. auth. \$11,500,000, issued \$6,000,000; pref. 8% non-cum. \$5,500,000. Formerly known as Superior Steel Company, reorganized as Superior Steel Corporation, Dec., 1916.

E. W. Harrison, P.; at 907 Real Estate Trust Bldg., Philadelphia. C. H. Forster, V. P. & T.; H. D. Sarge, Sc. & A. T.; C. G. Parker, P. A.; at 529 Union Arcade Bldg., Pittsburgh. J. E. Bulger, G. S.; James W. Warren, Works M.; at Carnegie, Pa.

Sales offices:

Chicago, Steel Sales Corp., Jefferson & Adams Sts.

Detroit, George W. House, Ford Bldg.

New York, W. H. Leonori & Co., 30 Howard St.

Philadelphia, E. W. Harrison, 907 Real Estate Trust Bldg.

Works at Carnegie, Pa.: blt. 1892, f. o. Jan. 3, 1893; four 4-d. gas-fired heat. fur.; one cont. coal-fired heat. fur.; 5 gas prod.; 16" hot strip mill, with 20" 3-st. roughing, 3-st. edging, 16" 5-st. finishing; 14" hot strip mill with 20" 1-st. roughing, 14" 3-st. edging and flat, 14" 5-st. finishing; 12" hot strip mill with 20" 1-st. roughing, 14" 2-st. edging, 12" 5-st. finishing; 9 box annealing fur.; one Mesta pickling mach.; 18 pickling tanks; cold strip mills, one 14" with 3-st. 2-h. and 1-st. 3-h., four 12" with 17-st. 2-h. and 2-st. 3-h., eight 10" with 25-st. 2-h., three 8" with 5-st. 2-h.

Product: hot rolled strip steel for own use and for sale, annual cap., 120,000 tons; cold rolled strip steel, annual cap., 60,000 tons.

Susquehanna Iron Co., Philadelphia, Pa., see 1916 Directory, p. 311.

Columbia Mill, Susquehanna Mill and Susquehanna Tube Mill, Columbia, Pa., formerly leased to E. T. Edwards, were returned to the owner and leased to A. M. Byers Co. from June 1, 1916 to Oct. 1, 1918 (Columbia Mill), and Sept. 1, 1918 (Susquehanna Mill and Susquehanna Tube Mill). Susquehanna Mill was sold to the Reading Iron Co., March 7, 1920. Columbia Mill and Susquehanna Tube Mill were sold March 27, 1920, to L. Lee of Youngstown, Ohio, who soon after sold Columbia Mill to the Reading Iron Co., retaining the tube mill. Union Street Mill, long idle and considered as abandoned, was sold to E. T. Edwards, Feb., 1917. East End Mill was leased to E. T. Edwards, Jan. 1, 1913.

SUWANEE IRON CO., Nashville, Tenn.

Inc. March, 1917 in Kentucky. Capital stock: com. auth. \$500,000, issued \$158,600.

J. M. Overton, P.; C. Cooper, Sc. & T.; at Nashville. D. I. Miller, V. P. & G. M.; at Grand Rivers, Ky.

Brand: "Suwanee."

Grand Rivers Furnaces: 2 stacks, blt. 1890-91; No. 1, 60' x 12' 6", No. 2, 60' x 13' 6", relined 1918; 8 iron pipe stoves; 2 steam blowing eng.; 16 flue boilers, 800 H. P. Coke: local and Alabama brown hematite ore. (Formerly owned by Hillman Land & Iron Co.; acquired by Suwanee Iron Co., March, 1917.)

Company owns iron ore mine at Russellville, Ala., annual cap., 40,000 tons.

Product: foundry pig iron, annual cap., 50,000 tons.

SWEDISH CRUCIBLE STEEL CO., Butler St. & Grand Trunk R. R., Detroit, Mich.

Inc. Nov., 1910 in Michigan. Capital stock: com. \$60,000.

Nels L. Olson, P., T. & G. M.; A. J. W. Nixon, V. P.; C. E. Bandfield, Sc. & P. A.; J. V. Breaud, G. S.

Works at Detroit: blt. 1911; two Breaud converters (one 3,500-lb., one 1,500-lb.); four 6-pot crucible fur.; 2 cupolas.

Product: steel castings up to 5-ton for sale, annual cap., 3,000 tons converter, 600 tons crucible steel castings. Principal product, pots and boxes.

SWEDISH CRUCIBLE STEEL CO. OF CANADA, Ltd. (The), Windsor, Ontario, Canada.

Inc. June, 1913 in Province of Ontario. Capital stock: com. \$100,000; pref. \$100,000.

Nels L. Olson, P.; A. J. W. Nixon, Sc. & T.; F. B. Sweet, A.

Windsor Works, Windsor: blt. 1913-14; three 4-pot crucible fur.; one 2-ton Breaud converter; crucible steel first made April, 1914, converter steel in November, 1914.

Product: steel castings, annual cap., 2,875 tons (375 tons crucible, 2,500 tons converter).

SWEET'S STEEL COMPANY, Williamsport, Pa.

Inc. Aug. 5, 1903 in Pennsylvania. Capital stock: com. auth. \$600,000, issued \$400,000; pref. 6% cum. auth. \$300,000, issued \$300,000; bonds \$100,000.

Robert L. Ahles, P. & G. M.; John M. Young, V. P. & T.; Daniel F. Swartz, Sc. & A. T.; R. K. Cheney, G. S.; Charles C. Steel, G. S. M.; John E. Spotts, P. A.

Sales offices: New York, J. H. Finch, 2 Rector St.; Philadelphia, L. E. Kipe, Land Title Bldg.; Wilkes-Barre, Pa., W. L. Richards, Miners Bank Bldg.

Works at Newberry, Williamsport, Pa.: blt. 1903-04, first steel made July 27, 1904; first rolled products, Sept. 17, 1904; open hearth steel plant leased to Pine Iron Works; 2 cont. coal-fired heat. fur.; 16" 3-h. 2-st. rail; 14" 3-h. 7-st. bar; 9" 3-h. 3-st. bar. Fuel, coal and prod. gas. Product: ingots, merchant steel bars and shapes, concrete bars, light rails 8-lb. to 60-lb. sections, bedstead angles, shapes, angle splice bars, fish plate bars, steel ties. Annual cap., 60,000 tons rails, 40,000 tons merchant bars, light structural shapes, etc.

Sylvester Co. (The), Danvers, Mass.

The Sylvester Co. was acquired by Massachusetts Iron and Steel Co., April 1, 1920. For capitalization, officers, etc., see p. 397, Addenda.

Danvers Iron Works, Danvers, Mass.: 2 single puddling fur.: 1 rotary squeezer; four 4-d. reverb. coal-fired heat. fur.; 18" 3-h. 3-st. comb. bar and muck, 10" 3-h. 5-st. guide, 16" 2-h. 1-st. universal mill; 2 steam ham. (100-lb. and 250-lb.); 3 forging presses. Product: merchant bars, bolt and spike rods, spikes, bolts and other forgings, annual cap., 10,000 tons scrap and muck bar, 20,000 tons rolled products.

SYRACUSE ALLOY STEEL CO., Syracuse, N. Y.

Reinc. Nov. 29, 1919 in New York. Capital stock: com. 3,000 shares, no par value; pref. \$100,000.

Frederick C. Raab, P.; John E. Lynch, 1 V. P. & G. S.; C. A. Lawton, Sc.; M. C. Warwick, T. & G. M.; at Syracuse. F. W. Hertrich, 2 V. P.; at Flint, Mich.

Brands: "Arab" and "Sasco" high speed steel.

Works at West Towpath, Syracuse: blt. 1917, first steel, Sept. 1, 1917; ten 2-pot crucible fur.; 10" 3-h. 5-st. bar mill; 3 steam hammers (500-lb. to 4,000-lb.). Product: crucible steel ingots, alloy and high speed steel ingots; high speed bars, tool bits and forged cutter blanks; annual cap., 1,000 tons.

Building new works at Thompson Road, Syracuse: 12-pot crucible fur.; 10" 3-h. 5-st. bar mill; hammers. Product: high speed steel bars, tool bits and forgings, annual cap., 1,000 tons ingots, 1,000 tons rolled and hammered products.

Syracuse Crucible Steel Co., Syracuse, N. Y., see 1916 Directory, p. 313.

Plant at Syracuse built in 1916 and leased to Halcomb Steel Co. The company was subsequently merged in the Halcomb Steel Co., and the plant is operated as part of the Halcomb Steel Company's works.

Tacony Ordnance Corpn., Tacony, Philadelphia, Pa., built a steel plant at Tacony in 1917-18; acquired by Tacony Steel Co., August, 1919.

TACONY STEEL CO., Tacony, Philadelphia, Pa.

Inc. Nov. 3, 1899 in New Jersey. Capital stock: com. auth. \$150,000. Formerly known as Philadelphia Steel & Forge Co.; name changed to Tacony Steel Co., April 1, 1917. Subsidiary of Penn Seaboard Steel Corporation since Feb. 5, 1920.

John B. Warren, P.; George Satterthwaite, V. P.; Henry T. Stetson, Sc.; C. F. Jemison, T.; H. D. Siegfried, P. A.

Sales offices:

Boston, C. G. Fallon, 703 Oliver Bldg.

Bridgeport, Hunter & Havens, 245-267 Water St.

Chicago, Frank B. Hillwick, Marquette Bldg.

Cleveland, W. W. Keefer, 804 Sweetland Bldg.

Detroit, D. J. Crowley, 832 Dime Savings Bank Bldg.

New York, P. J. Driscoll, 2 Rector St.

Providence, Congdon & Carpenter, 155 Canal St.

Works at Tacony: orig. blt. 1898; 7 heat. fur. (three 2-d. billet, four 4-d. bar); 4 annealing fur.; two 12" 3-h. 3-st., one 10" 3-h. 7-st. merchant bar mills; 4 ham. (1,600-lb. to 14,000-lb.). Fuel, bit. coal. Machine shop for own use and jobbing. Product: merchant bars, rounds, squares, flats and special shapes; alloy steel bars; forged bars, die blocks, shafts, crank shafts, axles, etc.; annual cap., 60,000 tons rolled and 8,000 tons forged products.

Steel Plant at Tacony, Philadelphia: blt. 1917-18; f. o. May, 1918; two 40-ton A. O. H. fur.; 3 steam hydraulic presses (two 1,000-ton, one 2,000-ton). Machine shop for rough machining. (Formerly owned by the Tacony Ordnance Corpn., acquired by the Tacony Steel Co., Aug., 1919.) Product: steel ingots, alloy steel ingots; carbon and alloy steel forgings, smooth forged, rough machined or heat treated. Annual cap., 40,000 tons steel ingots, 12,000 tons forged products.

TAYLOR (N. & G.) CO., Inc., 300 Chestnut St., Philadelphia, Pa.

Est. 1810; inc. 1917 in Maryland. Capital stock: com. \$175,000; pref. 6% cum. \$625,000.

Hollinshead N. Taylor, P.; Wm. W. Justice, Jr., V. P.; Edward S. Lewis, Sc. & T.; at Philadelphia. L. L. Helmer, G. M.; at Cumberland, Md.

Sales offices:

Chicago, C. H. Hallgath, 1826 Cont. & Com. Nat. Bank Bldg.

New York, J. P. Donnelly, Woolworth Bldg.

San Francisco, J. A. Drummond, 245 Mission St.

The company owns a controlling interest in the Taylor-Offutt Coal Co., which operates a coal mine at Oakland, Md.

Works at Cumberland, Md.: Steel Works blt. 1899; four 25-ton B. O. H. fur.; 1 cont. ingot heat. fur.; 24" 3-h. 2-st. billet and bar mill; fourteen sheet and pair fur.; 6 hot black plate mills (26" x 30" and 26" x 32"); 3 pickling mach.; 6 cold mills (one train 2-st. 22" x 32" and 22" x 36"; one train 4-st. 22" x 32" and 22" x 36"); 5 box annealing fur. Fuel, coal, oil and nat. gas. Tinplate Plant; blt. 1912-13, f. o. Sept., 1913; 16 stacks (8 coke, 2 charcoal, 6 terne). Fuel, coal, oil and nat. gas. Copperas plant (annual cap., 500 tons). Gray iron and brass foundry; 1 cupola (annual cap., 1,000 tons).

Product and annual cap.: steel ingots (36,000 tons), steel billets, bars and sheet bars (30,000 tons); black sheets and black plates for tinning (17,000 tons); tinplates (350,000 boxes) and terne plates (150,000 boxes).

TAYLOR (W. P.) COMPANY, 218 Ellicott Sq., Buffalo, N. Y.

Inc. May 1, 1907 in New York. Capital stock: com. \$150,000.

W. P. Taylor, P.; C. D. Taylor, V. P.; F. J. Abel, Sec. & T.

Works at 575 Howard St., Buffalo: blt. 1894; one 2-ton Heroult electric fur.; Stock converter (½-ton) idle. Gray iron foundry (6,500 tons railway castings).

Product: electric steel castings for auto trucks and heavy machinery, annual cap., 1,800 tons.

TAYLOR-WHARTON IRON & STEEL CO., High Bridge, N. J.

Inc. Aug. 7, 1891 in New Jersey. Capital stock: com. auth. \$4,000,000, issued \$1,600,000; pref. 7% cum. auth. \$2,000,000, issued \$1,876,300; bonds \$2,847,500.

Knox Taylor, P.; Victor Angerer, V. P.; Percival Chrystie, V. P.; Dr. Henry M. Howe, V. P.; W. A. Ingram, Sec. & T.; W. S. Stothoff, Works M., Easton and High Bridge; B. F. Robbins, P. A., High Bridge; L. F. Burkley, P. A., Easton, Pa.

Sales offices:

Boston, J. C. Robinson, 45 Bromfield St.

Chicago, H. F. McDermott, 208 South La Salle St.

Cleveland, J. R. Smith, 1211 Citizen's Bldg.

New York, G. R. Lyman, 30 Church St.

Philadelphia, R. C. McCloy, 732 Widener Bldg.

Pittsburgh, C. W. Smith, 1418 Oliver Bldg.

San Francisco, R. W. Seyms, 509 Insurance Exchange Bldg.

Scranton, Pa., 522 Connell Bldg.

Product: manganese steel, special alloy, and heat treated castings; manganese steel safes and vaults; special track work (switches, frogs and crossings); rolls, rolling mills and rolling mill machinery; light and heavy, pressed and hammered, iron and steel forgings; truck wheels, tractors and tractor parts. Annual cap., 40,000 tons steel castings.

The company was incorporated Aug. 7, 1891 in New Jersey under the name of Taylor Iron & Steel Co. In 1912 the corporate title was changed to Taylor-Wharton Iron & Steel Co. In 1909 the company acquired the Manganese Steel Safe Co., with plant at Plainfield, N. J., which plant was abandoned in 1918 and the business removed to High Bridge. In 1912 the entire interest of the Wm. Wharton, Jr. & Co., Inc., of Philadelphia, and its subsidiary The Philadelphia Roll & Machine Co., was acquired. In 1915 an entirely new plant was built at Easton, Pa., to which the business of Wm. Wharton, Jr., & Co., Inc., was transferred; The Philadelphia Roll & Machine Co., was extended into the vacant Wharton Plant. Late in 1915 the Wharton Switch Works, Jenkintown, Pa., was abandoned and the business moved to Easton Works. In 1913 the Tioga Steel & Iron Co. of Philadelphia was acquired and the plant enlarged in 1917 by the erection of a gun forging plant for the Government. The subsidiary companies retain their corporate form and operate the plants owned by them, as follows:

William Wharton, Jr., & Co., Inc., Easton, Pa.

Philadelphia Roll & Machine Co., Philadelphia, Pa.

Tioga Steel & Iron Co., Philadelphia, Pa.

Manganese Steel Safe Co., High Bridge, N. J.

Hunterdon Electric & Power Co., High Bridge, N. J.

Jersey Electric Co., High Bridge and Clinton, N. J.

High Bridge Works, High Bridge, N. J.: blt. 1892, first manganese steel Sept., 1892; two 3-ton converters; one 3-ton Heroult electric fur.; 2 cupolas (1 for pig iron, 1 for ferro-manganese, etc.). Gray iron foundry. Fuel, coal, coke and oil. Machine shops for finishing manganese steel castings. Product: manganese, nickel-chrome and other special alloy and heat treated steel castings; small manganese steel ingots; manganese steel castings for dredges, crushers, steam shovels, gears, wheels, chain, tractor parts, pipe balls, safes and vaults. Annual cap., 12,000 tons converter and 2,500 tons electric steel castings.

Easton Works, Easton, Pa.: blt. 1915, f. o. March, 1916; two 2-ton Tropenas converters; one 6-ton Heroult electric fur.; 2 cupolas. Forging plant with heavy hammers, presses and forging mach. Machine shop; foundry for gray iron and semi-steel castings. Product: steel castings, annual cap., 10,000 tons (5,000 tons converter, 5,000 tons electric); gray iron and semi-steel castings, 6,000 tons; special track work, track work with manganese steel wearing parts; iron and steel forgings, gas containers, truck and tractor wheels.

Philadelphia Roll Works, 25th St. & Washington Ave., Philadelphia, Pa.: two 4,000-lb. Tropenas converters; one 25-ton A. O. H. fur.; 3 cupolas; 3 air fur. Product: steel castings and steel ingots for own use and for sale, annual cap., 15,000 tons (8,000 tons open hearth ingots, 4,000 tons open hearth castings; 3,000 tons converter

castings); forging ingots; carbon and alloy steel rolls; sand and chilled iron rolls; rolling mills and rolling mill machinery.

Tioga Works, 52nd St. & Grays Ave., Philadelphia: forging plant with heavy hammers, presses and special heat-treating plant. Product: light and heavy iron and steel forgings; special steel forgings, ship forgings, etc.

TENNESSEE COAL, IRON & RAILROAD CO., Brown-Marx Bldg., Birmingham, Ala.

Inc. Mar. 24, 1860 in Tennessee. Subsidiary of the United States Steel Corporation.

George G. Crawford, P.; H. C. Ryding, V. P.; L. T. Beecher, Sec. & T.; F. B. Winslow, A.; Willard Wilson, G. S. M.; G. H. Gray, P. A.

Sales offices:

Boston, W. S. Locke, 120 Franklin St.
Buffalo, Fred C. Deming, Marine Trust Co. Bldg.
Chicago, Edwin S. Mills, 208 South La Salle St.
Cincinnati, George H. Vant, Union Trust Bldg.
Cleveland, James R. Mills, Rockefeller Bldg.
Denver, E. M. Sparhawk, First Natl. Bank Bldg.
Detroit, W. B. Weston, Ford Bldg.
New Orleans, S. W. Wheelock, Maison Blanche.
New York, Charles C. Cluff, 30 Church St.
Philadelphia, James B. Bonner, Widener Bldg.
Pittsburgh, A. M. Harper, Carnegie Bldg.
St. Louis, W. W. Scott, Jr., Third Natl. Bank Bldg.
St. Paul, W. J. Totten, Pioneer Bldg.

Export representatives: United States Steel Products Co., 30 Church St., New York.

Pacific Coast representatives: United States Steel Products Co. at Jackson St. & Central Ave., Los Angeles; Selling Bldg., Portland, Oregon; Rialto Bldg., San Francisco; 4th Ave. South & Connecticut Ave., Seattle.

Brands: For pig iron, "Alice," "De Bardeleben," "Ensley." For steel and steel rails, "Ensley."

Product: coal and coke; basic, foundry and forge pig iron; spiegeleisen and ferro-manganese; basic phosphate fertilizer; steel ingots; blooms, billets and slabs; steel rails, bars, concrete bars, structural shapes and sheared plates.

Total annual capacity: 1,340,200 tons pig iron; 1,115,000 tons ingots; 910,000 tons blooms, billets and slabs; 672,000 tons rolled products including 324,600 tons rails, 172,000 tons sheared plates, 175,400 tons structural shapes and merchant bars.

The company operates iron ore mines, coal mines, by-product and beehive coke ovens, benzol recovery plant, blast furnaces, steel works, rolling mills and fertilizer plant.

Alice Furnace, Birmingham, Ala.: 1 stack, 73' 1½" x 18' 6", blt. 1883, rebt. 1918; six stoves (3 Whitwell, 70' x 19'; 3 Gordon, 60' x 19'); 5 steam blowing eng. (75,000 cfm.); 2 water-tube and 20 flue boilers, 2,000 H. P. By-product coke: local red and brown ore. Product: forge pig iron, annual cap., 117,700 tons.

Bessemer Furnaces, Bessemer, Ala.: 5 stacks.

No.	Present size	Built	Blown in	Relined.
1	75' 1¼" x 18' 5½"	1886-87	1888	1918
2	74' 6" x 17' 9½"	1886-87	1889	1920
3	75' 3" x 19' 7¼"	1889-90	—	1919
4	75' 4½" x 19' 8½"	1889-90	—	1920
5	61' 6" x 13' 1"	1889-90	—	1917

Nineteen Whitwell stoves (eight 60' x 20', one 67' x 20', seven 52' x 20', three 52' x 18'); 18 steam blowing eng. (210,000 cfm.); 35 water-tube, 26 flue, boilers, 9,400 H. P.; 1 slag granulating pit. By-product coke: local red and brown ore. Product: basic and foundry pig iron and ferro-manganese, annual cap., 385,200 tons. Bessemer Rolling Mill, Bessemer, Ala.: blt. 1887-88; 4 heat. fur. (one 4-d., one 6-d., 2 cont.); 16" 3-h. 3-st. bar mill; 12" 3-h. 1-st. roughing and 8" 3-h. 5-st. finishing guide mill; sheared plate mill with 30" x 100" 2-h. roughing and 28" x 92" 3-h. finishing stands. Product: merchant bars, twisted bars, shapes, light rails, ship, tank and boiler plate; annual cap., 62,000 tons merchant bars, 48,000 tons sheared plates.

Ensley Works, Ensley, Ala.: Ensley Furnaces: 6 stacks.

No.	Present size	Built	First blown in	Rebuilt	Relined
1	90' x 22' 5"	1887-89	Mar. 19, 1889	1911	1915
2	90' x 22' 4"	1887-88	Dec. 1, 1888	1910	1918
3	90' x 22' 6"	1887-88	June 5, 1888	1909	—
4	90' x 22' 9"	1887-88	Apr. 9, 1888	1907	1916
5	82' 10" x 22'	1903-05	Apr. 17, 1906	—	1919
6	82' x 20' 9"	1903-05	Apr. 28, 1905	—	1916

Twenty-six hot blast stoves (20 McClure, 100' x 21', 4 Kennedy, 93' 3" x 21', 2 Roberts, 110' x 22'); 22 steam blowing eng. and 3 turbo-blowers (525,000 cfm.); 54 water-tube boilers, 21,230 H. P., serve also electric power house and in part the rolling mills; 2 Heyl & Patterson double-strand pig casting mach.; 1 slag granulating pit. By-product coke: local red and brown ore. Product: foundry, forge and basic pig iron, annual cap., 766,100 tons.

Steel Works: three 20-ton Bessemer converters for duplexing, etc.; 2 cupolas; 9 B. O. H. fur. (100-ton); one 10-ton B. O. H. fur. for castings; one 6-ton Heroult electric fur. for melting ferro; 3 mixers (250-ton, 400-ton, 600-ton); gray iron foundry. Product and annual cap.: 1,115,000 tons ingots, 5,000 tons steel castings, 2,000 tons gray iron castings, 18,000 tons ingot molds.

Rolling mills: 10 four-hole soaking pits; one 1-hole preheater; 1 cont. reheat. fur.; 44" 2-h. 1-st. blooming; 34" 2-h. 1-st. roughing;

28" 3-h. 3-st. finishing; 34" 2-h. 1-st. billet. Product and annual cap.: 610,000 tons blooms, billets and slabs, 324,600 tons rails.

Fairfield Steel Works, Fairfield, Ala.: blt. 1917-19; four 4-hole soaking pits (hot ingots from Ensley Works); eight 5-d. slab and bloom reheat. fur.; 45" 2-h. 1-st. blooming, f. o. June 19, 1919; 28" 3-h. 1-st., 26" 2-h. 3-st. and 24" 2-h. 2-st. comb. bar and structural, f. o. June 20, 1919; 36" x 110" 3-h. sheared plate mill, f. o. Jan. 13, 1919. Fabricating shops consisting of plate shop, machine shop, forge shop, bolt and rivet shop and gray iron foundry. Product and annual cap.: 300,000 tons blooms, billets and slabs; 113,400 tons structural shapes and merchant bars; 124,000 tons ship, tank, boiler and bridge plates.

Oxmoor Furnaces, Oxmoor, Ala.: 2 stacks (alternate), 73' 4" x 17' 10", blt. 1876-77, relined 1917; 7 Whitwell stoves (three 65' x 18', three 62' x 18', one 59' x 19'); 5 steam blowing eng. (60,000 cfm.); 10 water-tube boilers, 2,500 H. P. By-product coke: local red and brown ore. Product: foundry and basic pig iron, annual cap., 71,200 tons.

South Pittsburg Furnaces, South Pittsburg, Tenn., were dismantled in 1917.

Coal and coke properties: the company owns about 300,000 acres of coal lands. Located on the developed portions of this property are 9 coal mining plants, comprising 15 operating mines, producing coal for steam and gas purposes and for manufacture into coke. Connected with the mines are 8 operating coal washing plants and 7 coke plants with a total of 2,974 beehive coke ovens.

At Fairfield, Ala., there are 434 Koppers by-product coke ovens, annual cap., 1,817,000 net tons coke. By-product recovery plant and Carl Still benzol plant.

Iron ore properties: the company owns an extensive acreage of iron ore land in Alabama and Tennessee, upon which mines have been developed as follows: on the Red Mountain Range near Birmingham, Muscoda group (4 active mines), Wenonah group (5 active mines), Ishkooda group (4 active mines); at Greeley, Ala., Greeley group (2 active mines) and Champion group (1 active mine).

Miscellaneous properties: The company owns limestone and dolomite quarries, and timber and other lands. It owns the entire capital stock of the Birmingham Southern R. R. Co., the Tennessee Land Co., Chickasaw Shipbuilding & Car Co., Chickasaw Utilities Co., Chickasaw Land Co., and Fairfield Utilities Co.; and a controlling interest in the Ensley Land Co.

TENNESSEE MANGANESE CO., Knoxville, Tenn.

Inc. in Tennessee. Capital stock: auth. \$200,000, issued \$150,000. D. C. Campbell, P.; Forrest W. Andrews, Sec. & T.

Works at Cleveland, Tenn.: electric furnace for manufacture of ferro-alloys. Electric power from Tennessee Power Co., Chattanooga.

Product: silvery pig iron, ferro-silicon, ferro-manganese; annual cap. 4,500 tons silvery pig or ferro-silicon, 3,000 tons ferro-manganese.

TENNESSEE VALLEY IRON & RAILROAD CO., Arrott Bldg., Pittsburgh, Pa.

Inc. 1886 in Tennessee. Capital stock: com. auth. \$1,500,000, issued \$1,423,500; bonds \$78,000.

C. N. Brady, P.; at Washington, Pa. R. D. Baker, Sec. & T.; at Pittsburgh. Thomas S. Bailie, V. P. & G. M.; R. S. Durrett, G. S.; B. F. Wilkinson, P. A.; at Collinwood, Tenn.

W. H. Matthews, Memphis, Tenn., and J. H. DeWitt, Nashville, Tenn., appointed receivers Sept. 23, 1918.

Anna Furnace, Collinwood, Tenn.: 1 stack, 62' 9" x 13', const. begun 1918, completed; to blow in in June, 1920; 2 iron pipe stoves; 2 steam blowing eng. (20,000 cfm.); 5 tubular boilers, 750 H. P., 5 additional boilers to be installed. Charcoal: brown hematite ore. Owns brown ore mine at Hardwick, Wayne Co., Tenn., annual cap., 75,000 tons. Affiliated company, known as Wayne Wood Products Co., owns charcoal plant adjoining furnace with 20 ten-cord retorts and by-product recovery plant, annual cap., 4,000,000 bu. charcoal.

Product: hot blast charcoal pig iron, annual cap., 36,000 tons.

Texas Rolling Mill Co., Fort Worth, Texas, see 1916 Directory p. 318; acquired by G. W. Armstrong & Co., Fort Worth, Texas, in May, 1916.

Texas (State of), Board of Prison Commissioners, Huntsville, Texas, see 1916 Directory, p. 319. Furnace known as Sam Lanham Furnace, at Rusk, Texas, sold to Texas Steel Co., Jan. 18, 1918.

TEXAS STEEL CO., 441 Keith Bldg., Beaumont, Texas.

R. S. Collins and W. H. Lantz, Receivers.

Sam Lanham Furnace, Rusk, Texas: 1 stack, 65' 6" x 12', blt. 1883, last rebt. 1903; 3 stoves, 60' x 16'. Coke: local hematite ore. Cast iron pipe foundry.

Product: foundry and forge pig iron, annual cap., 36,000 tons.

THOMAS FURNACE CO. (The), Milwaukee, Wis.

Inc. Mar., 1904 in Wisconsin. Capital stock: com. \$150,000.

John M. Thomas, P.; R. M. Jones, Jr., T.; at Milwaukee. T. E. Thomas, V. P.; at Niles, Ohio. W. Aubrey Thomas, V. P.; at Jenifer, Ala.

Brand: "Thomas."

Thomas Furnace at Milwaukee: one stack, 83' x 18', blt. 1908; 2 Massicks & Croke stoves, 75' x 18'; 2 T. E. Thomas stoves, 90' x 18'; 3 steam blowing eng. (48,000 cfm.); 6 water-tube boilers, 2,400 H. P.; 1 Pittsburgh Coal Washer Co. single-strand casting mach.; slag granulating pit (annual cap., 100,000 tons). Coke:

Lake ore. Company is interested in Morgan Mine at Wakefield, Mich.; and Indiana Mine at Iron Mountain, Mich.

Product: copper free low-phosphorus, bessemer and malleable pig iron, annual cap., 90,000 tons.

THOMAS IRON CO. (The), Hokendauqua, Pa.

Inc. April 4, 1854 in Pennsylvania. Capital stock: com. \$2,500,000; bonds \$639,500.

W. A. Barrows, Jr., P. & G. M.; J. E. Rotthaus, A. P. & A.; Oliver T. Case, Sec. & T.; at Hokendauqua. Fred R. Drake, V. P.; at Easton, Pa.

Sales offices:

Boston, E. Arthur Tutein, 50 Congress St.

Hokendauqua, Elbridge Walker, G. S. A.

New York, Philip E. Wright, 90 West St.

Philadelphia, Philip E. Wright, Stephen Girard Bldg.

Product: foundry, forge, malleable and basic pig iron.

Brands: "Thomas Vanadium," "Saucon."

The company owns and operates 3 blast furnace plants with 5 stacks, total annual cap., 259,000 tons.

Hokendauqua Furnaces, Hokendauqua, Pa.: 2 stacks; No. 1, 84' 8" x 18', blt. 1854, last rebt. 1918; No. 3, 81' x 18' 6", blt. 1863, last rebt. 1919; 9 stoves (four 95' x 18', rebt. 1918; four 80' x 18', one 90' x 20'); 2 steam blowing eng., (80,000 cfm.); 20 boilers (4 water-tube, 16 tubular) 3,450 H. P. By-product and beehive coke: New Jersey magnetite, local hematite and Lake ore. Product: foundry and forge pig iron, annual cap., 175,000 tons.

Lock Ridge Furnaces, Alburtis, Pa.: 2 stone stacks; No. 7, 60' x 13', steel shell in stone stack, blt. 1867, rebt. 1915; No. 8, 60' x 13', stone stack with steel top, blt. 1869, rebt. 1918; 2 fire-brick stoves, 70' x 18', two-pass with iron pipe preheaters; 2 iron pipe stoves; 3 steam blowing eng. (23,000 cfm.); 5 water-tube boilers. By-product and beehive coke: New Jersey, local and Lake ores. Product: foundry and forge pig iron, annual cap., 42,000 tons.

Saucon Furnace, Hellertown, Pa.: 1 stack, No. 11, 72' x 16', blt. 1870, rebt. 1918; 4 Durham iron pipe stoves; 3 steam blowing eng. (25,000 cfm.); 4 water-tube boilers, 1,000 H. P. By-product and beehive coke: New Jersey, local and Lake ores.

Product: foundry, forge, malleable and basic pig iron, annual cap., 42,000 tons.

Keystone Furnace, Island Park, Easton, Pa., formerly owned by this company, was sold to the Northern Ore Co., June 28, 1917.

The company owns the Richard Mine, Wharton, N. J., annual cap., 200,000 tons.

The company owns stock interests in the following railroad properties:

The Ironton Railroad Co. (100%).

- The Saucon Valley Iron & Railroad Co. (100%).
The Catasauqua & Fogelsville Railroad Co. (40%).
The Mount Hope Mineral Railroad Co. (33 $\frac{1}{3}$ %).

Thomson Operating Co., Winborn, Miss., leased Ole Miss Furnace at Winborn, formerly operated by Memphis Mining & Mfg. Co., in spring of 1917. Lease expired April 28, 1919; furnace returned to owner, Mrs. William Warmack, Lamkin, Miss.

THROPP, JOSEPH E., Everett, Bedford Co., Pa.

Joseph E. Thropp, Owner; Douglas S. Thropp, G. M. & P. A.
Sales agents: Pilling & Crane, Finance Bldg., Philadelphia.

Brands: "Everett" and "Saxton."

Earlston Furnace, Everett, Pa.: 1 stack, 82' x 19'4", blt. 1883-84, reblt. 1909-10, relined 1917; 4 stoves (3 Siemens-Cowper-Cochrane, 90' x 18' 6"; 1 Hartman, 87' x 16'); 4 steam blowing eng. and 1 turbo-blower (45,000 cfm.); 14 boilers (4 water-tube, 4 tubular, 6 cylindrical) 4,000 H. P.; Greenawalt sintering plant for flue dust and pyrites cinder, annual cap., 40,000 tons; briquetting plant abandoned. Beehive coke: Lake and local ore. Product: foundry, forge and basic pig iron, annual cap., 100,000 tons.

Saxton Furnaces, Saxton, Pa.: 2 stacks; No. 1, 70' x 18', blt. 1880-81, f. o. Oct. 16, 1882, long idle and has no lining; No. 2, 81' x 17' 8", blt. 1886-87, remod. 1912, relined 1919; 3 stoves, 60' x 18'; 2 steam blowing eng. (30,000 cfm.); 10 water-tube boilers, 3,000 H. P. Beehive coke: Lake and local hematite ore. Product: foundry, forge and basic pig iron, annual cap., 75,000 tons.

Iron ore properties: Mines at Dungarvin, Pa., Catoctin, Md., Antietam, W. Va., and Hill Top Mines at Crystal Falls, Mich.; also undeveloped iron ore properties at McCoys Ferry, W. Va., and in Bedford and Huntingdon Counties, Pa. Annual cap. of active mines, 50,000 tons. Limestone quarry at Ashcom, Bedford Co., Pa., annual cap., 150,000 tons.

Coal mines and coke ovens: owns Kearney mines in Bedford Co., Pa., and Melrose and Gordon mines near Minersville, Huntingdon Co., Pa., annual cap., 500,000 tons. Also owns 590 beehive coke ovens; 170 at Kearney, 180 at Saxton, 90 at Melrose and 150 at Gordon, annual cap., 200,000 net tons coke.

TIMKEN-DETROIT AXLE CO. (The), 136-210 Clark Ave., Detroit, Mich.
Inc. June 9, 1909 in Ohio. Capital stock: com. auth. \$30,000,000, issued \$3,000,000; pref. 7% cum. auth. \$15,000,000, issued \$5,000,000.

A. R. Demory, P.; H. W. Alden, V. P.; Fred Glover, V. P. & G. M.; C. W. Dickerson, Y. P. & Sc.; C. G. Rowlette, T.; P. W. Hood, G. S. M.; F. H. Maisonville, P. A.

Sales office: Chicago, Ill., L. M. Williams, 1843 Peoples Gas Bldg.
Company operates plants at Clark Ave., Detroit, for commercial car axles, drop forgings, and worm gearing; at Waterloo Ave.,

Detroit, for passenger car axles, and Service Division; at Waynesburg Road, Canton, Ohio, malleable iron and steel foundry, and machine shop.

Foundry, Waynesburg Road, Canton: one 2-ton Heroult electric fur., f. o. Jan. 1, 1918. Malleable iron foundry.

Product: steel castings, automobile castings, for own use and for sale, annual cap., 2,500 tons; nickel and chrome alloy steel castings; malleable iron castings for own use only, annual cap., 10,000 tons.

TIMKEN ROLLER BEARING CO. (The), Canton, Ohio.

Inc. Dec. 16, 1904 in Ohio. Capital stock: com. \$1,090,000; pref. \$6,660,000.

H. H. Timken, P.; Heman Ely, V. P. & T.; W. R. Timken, V. P.; J. G. Obermier, V. P.; J. F. Strough, Sc.; M. T. Lothrop, Works M.; A. J. Sanford, P. A.; J. H. Hughes, M. Steel and Tube Dept.

Works at Canton: blt. 1901; four 6-ton Heroult electric fur., first electric steel, Oct. 5, 1916; two 2-hole soaking pits; one cont. heat. fur.; 22" 3-h. 4-st. bar mill; one 600-ton hydraulic press; hot and cold units for seamless tubes; first tubes drawn Dec. 20, 1915. Fuel, nat. gas. and oil.

Product: electric steel ingots for own use, annual cap., 30,000 tons; chrome alloy steel ingots; piercing bars for own use and for sale, merchant and forging bars and billets, annual cap., 60,000 tons; cold drawn seamless tubes, 20,000 tons, cold drawn solids, 10,000 tons.

TINDEL-MORRIS COMPANY, Eddystone, Pa.

Inc. 1901 in Pennsylvania. Capital stock: com. auth. \$1,500,000, issued \$616,800; bonds \$775,000.

Adam Tindel, P., T. & G. M.; L. I. Morris, V. P.; Andrew Greene, Sc.; William J. Wallace, A. Sc.; L. K. Carroll, G. S.; James E. McKee, G. S. M.; Harry W. Thomas, P. A.

Sales agents: Cleveland, George S. Anderson Co., Hippodrome Annex; Pittsburgh, J. S. Morrison Co., Oliver Bldg.

Works at Eddystone: one 40-ton B. O. H. fur., f. o. Sept., 1918; 6 steam ham. (1-ton to 6-ton); 2 hydraulic forging presses (1,000-ton, 1,500-ton).

Product: steel ingots, annual cap., 24,000 tons; manganese, chrome, nickel and vanadium alloy steel ingots; seamless gas cylinders, rough machined and finished machined forgings, inserted tooth saws, and milling cutters, annual cap., 13,400 tons forgings.

TISON, ALEXANDER, Trustee, 15 William St., New York.

Talladega Furnace, Talladega, Ala.: 1 stack, 80' x 18', blt. 1889, remod. 1917-18; 3 hot-blast stoves, 65' x 26'; 2 steam blowing eng.; 3 water-tube boilers. Coke: local brown and red ore. Owns 60 beehive coke ovens at Coal City, Ala., and 122 beehive coke ovens at Talladega. (Formerly owned by Northern Alabama

Coal, Iron & Ry. Co.; acquired by Alexander Tison, trustee, Feb. 16, 1918).

Product: foundry pig iron, annual cap., 45,000 tons.

Titan Company (The), Newark, N. J., see 1916 Directory, p. 321, owns open-hearth steel casting plant at Newark, N. J. leased to Hewitt Steel Corporation, Jan. 1, 1916.

TITANIUM ALLOY MANUFACTURING CO. (The), 165 Broadway, New York, N. Y.

Inc. June, 1916 in Maine. Capital stock: com. \$500,000; pref. 7% cum. auth. \$500,000, issued \$270,600.

William F. Meredith, P.; William T. Meredith, V. P.; J. D. Meredith, Sc. & T.; George W. Bahrenburg, A. T.; Paul Hassis, A.; at New York. Andrew Thompson, G. M. & G. S. M.; T. C. Graham, C.; R. S. Tabor, A.; H. P. Armstrong, G. S.; C. P. Reisig, P. A.; at Niagara Falls, N. Y.

Sales offices: Chicago, William V. Knowles, Peoples Gas Bldg.; Pittsburgh, William J. Evans, Oliver Bldg.; Sheffield, England, T. Rowlands & Co., Ltd.

Works at Niagara Falls: blt. 1907, f. o. Aug. 17, 1907; 6 electric fur. Hydro-electric power from Niagara Falls Power Co.

Product: ferro-titanium and carbon free ferro-titanium, annual cap., 5,000 tons.

TIVANI ELECTRIC STEEL CO., Ltd., Belleville, Ontario, Canada.

Inc. 1911 in Province of Ontario. Capital stock: com. \$20,000.

J. W. Evans, P.; H. F. Ketchson, Sc. & T.; at Belleville. J. M. Wallace, G. M.; at Oakville, Ont.

Works at Belleville, Ontario: blt. 1912-13; f. o. June 13, 1913; 3 electric furnaces for manufacture of ferro-alloys (one of these in plant but not set up); ferro-alloys first made 1915; 1 one-ton electric fur. for manufacture of steel. Hydro-electric power.

Product: ferro-molybdenum, annual cap., 150 tons; low-phosphorus pig iron, annual cap., 1,800 tons; steel ingots, 1,000 tons.

TOLEDO FURNACE CO. (The), 600 Western Reserve Bldg., Cleveland, Ohio.

Inc. Feb. 3, 1902 in Ohio. Capital stock: com. auth. \$4,000,000, issued \$3,300,000.

H. S. Pickands, P.; J. C. McLaughlan, V. P.; S. E. Bool, Sc.; E. P. Williams, T.; at Cleveland. E. B. Hull, G. S.; at Toledo, Ohio.

Sales agents: Pickands, Mather & Co., 600 Western Reserve Bldg., Cleveland, Ohio.

Brand: "Toledo."

Toledo Furnaces, Toledo: 2 stacks; "A," 80' x 23', blt. 1902-03, f. o. May 31, 1903; "B," 85' x 21', blt. 1906-07, f. o. Jan. 5, 1907; 8 Kennedy stoves, 90' x 22'; 5 steam blowing eng. (100,000 fcm.);

18 water-tube boilers, 8,300 H. P.; 1 double-strand Uehling pig casting mach.; Dwight & Lloyd flue dust sintering plant, annual cap., 50,000 tons. By-product coke: Lake ore. By-product coke plant, with 94 Koppers cross regenerative ovens, by-product recovery plant and Koppers benzol plant, annual cap., 350,000 net tons coke, 2,000,000 gals. light oil.

Product: foundry, malleable and basic pig iron, annual cap., 350,000 tons.

TOLEDO STEEL CASTING CO. (The), Smead Ave. & Bancroft St., Toledo, Ohio.

Inc. 1904 in Ohio. Capital stock: com. \$100,000; pref. 7% cum. auth. \$100,000, none issued.

S. D. Carr, P.; J. B. Nordholt, V. P. & Works M.; C. C. Smith, Sc., T., G. S. M. & P. A.; B. A. Krueger, A.; G. A. Weihrauch, G. S. Sales office: Detroit, E. E. Robinson, Penobscot Bldg.

Works at Smead Ave., Bancroft St., & N. Y. C. R. R., Toledo: blt. 1890, first converter steel June, 1905; one 2-ton Tropenas converter; one cupola. Fuel, coke and oil.

Product: small steel castings for sale; vanadium alloy steel castings; annual cap., 3,000 tons.

Tonawanda Iron & Steel Co., North Tonawanda, N. Y., see 1916 Directory, p. 322. Plant leased to Donner Steel Co., Buffalo, in October, 1916, with option to purchase.

TREADWELL ENGINEERING CO., Easton, Pa.

Inc. Sept., 1910 in Pennsylvania. Capital stock: com. \$450,000; bonds, \$134,000.

M. H. Treadwell, Ch.; J. H. Killinger, P.; E. R. Euston, 2 V. P.; at 140 Cedar St., New York, N. Y. A. A. Neave, 1 V. P.; W. I. Gassert, Sc. & T.; A. J. McVay, G. S. M.; R. W. Foltz, P. A.; at Easton.

Works at Easton, Pa.: blt. 1911; one 2-ton Heroult electric fur.; 2 cupolas; gray iron foundry (annual cap., 15,000 tons).

Product: electric steel castings for own use and for sale; annual cap., 5,000 tons; manufacturers of rolling mill and steel works equipment.

TREDEGAR CO. (The), Richmond, Virginia.

Inc. 1867 in Virginia. Capital stock: com. auth. \$2,000,000, issued \$1,000,000; bonds \$191,000.

Archer Anderson, Jr., P.; J. R. A. Hobson, V. P.; J. R. J. Anderson, Sc. & T.; W. R. Trainham, A.; John T. Anderson, G. S. A.; St. G. M. Anderson, S. Foundry and Rolling Mills; M. De G. Hobson, S. Horseshoe Dept.

Brands: "Piedmont," "I X L," "Roadster," "Cranberry," "Prairie," "Togo" and "Tredeggar" for horseshoes.

Works at Richmond: blt. 1836; 13 coal heat. fur. (three 2-d., three 3-d., seven 4-d.); 7 gas heat. fur. (4-d.); 12 coke heat. fur. (two 2-d., four 3-d., six 4-d.); 1 scrap fur.; 2 bar mills, each 18" 3-h. 2-st.; 10" 3-h. 3-st. guide; 3 spike rod mills, each 10" 3-h. 3-st.; horseshoe mill 10" 3-h. 3-st.; 6 ham. (1,000 to 3,500-lb. and 1 trip); 21 spike mach. Gray iron and brass foundry for car wheels, projectiles and general castings. Machine, blacksmith and boiler shops, for car forgings, projectiles and machinery.

Product: merchant bar iron, railroad and black boat spikes, angle and fish plates, links and pins, car irons, horse and mule shoes. Annual cap., 55,000 tons rolled products.

TREMONT NAIL CO., West Wareham, Mass.

Inc. 1858 in Massachusetts. Capital stock: com. \$100,000.

E. P. Brown, P.; L. A. Coolidge, T.; at Albany Bldg., Boston, Mass. F. M. Larchar, G. M.; E. L. Bartholomew, G. S.; at West Wareham.

Sales office: Boston, Mass., 205 Lincoln St.

Works at West Wareham: orig. blt. 1820; three 30-ton B. O. H. fur.; 6 Stubblebine coal 3-d. heat. fur.; 30" 2-h. 1-st. blooming mill; 18" 3-h. 3-st. skelp mill; 100 cut nail machines. Gray iron and brass foundry for own use.

Product: ingots, slabs, billets, nail plate and cut nails. Annual cap., 25,000 tons ingots, 18,000 tons slabs and billets, 12,000 tons nail plate or skelp; 100,000 kegs cut nails.

TROJAN ELECTRIC STEEL CO., 3401 South Hoyne Ave., Chicago, Ill.

Inc. March, 1916 in Illinois. Capital stock: com. auth. \$75,000, issued \$73,100.

Windsor F. Aldrich, P.; Charles J. Farwell, V. P.; Eugene Guy Lilly, Sec. & T.; Vilas Parker, G. S.; M. Doherty, P. A.

Sales office: 3401 South Hoyne Ave., Chicago.

Works at 3401 South Hoyne Ave., Chicago (leased from H. H. Walker Co., Chicago): one 1-ton Heroult electric fur. blt. 1916-17, f. o. 1917; one 3,000-lb. steam hammer.

Product: electric steel ingots for sale; chrome and nickel alloy steel ingots; carbon and alloy tool steel. Annual cap., 1,800 tons ingots. Finished hammered bars and forgings in tool steel and special analysis steel.

TRUMBULL STEEL CO. (The), Warren, Ohio.

Inc. 1912 in Ohio. Capital stock: com. auth. \$14,000,000, issued \$10,000,000; pref. 7% cum. auth. and issued \$10,000,000.

Jonathan Warner, P.; W. H. B. Ward, V. P.; A. N. Flora, V. P.; Philip Wick, V. P.; W. M. McFate, V. P.; A. L. Button, Sc.; J. U. Anderson, T.; C. B. Myers, A.; G. A. White, G. M.; E. T. Sproull, G. S. M.; L. G. Gorman, P. A.

Sales offices:

Chicago, A. R. Johnson, 208 South La Salle St.
Cleveland, Warner A. Peck, 330 Engineers Bldg.
Dallas, M. G. Lipscomb, 1308 Busch Bldg.
Detroit, W. J. Hanna, 523 Ford Bldg.
El Paso, L. L. Gee, 401 First National Bank Bldg.
Kansas City, H. E. Daniels, 316 R. A. Long Bldg.
Memphis, H. R. Miller, 624 Randolph Bldg.
Nashville, Tillman Calvert, 1124 Stahlman Bldg.
New York, F. H. Colladay, 3846 Grand Central Terminal Bldg.
Philadelphia, J. B. Dewolf, 502 Widener Bldg.
St. Louis, H. C. Beckwith, 1416 Chemical Bldg.
San Francisco, Milton Pray, 844 Monadnock Bldg.
Seattle, Arthur H. Jones, 1420 L. C. Smith Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Product: black, blue annealed and galvanized sheets, black plate for tinning, tinplates, long terne plates, hot and cold rolled strip steel. Brand: "Trumbull."

Main Works, Warren, Ohio: blt. 1912-13, f. o. July 31, 1913; seven 100-ton B. O. H. fur.; 2 cont. heat. fur.; six 4-hole soaking pits; 36" 2-h. 1-st. blooming, 21" 2-h. 4-st. Morgan roughing, 18" 2-h. 6-st. Morgan sheet bar, 20" to 16" 2-h. and 3-h. 10-st. strip mill; cold strip train, 3 stands, 4 sets to stand, and 4 single mills; 23 hot black sheet mills (twenty 28" x 36", three 28" x 44"); 2 jobbing mills (32" x 72"); 19 hot black plate (tin) mills (sixteen 28" x 32", two 28" x 34", one 28" x 36"); 24 cold tin mills, 24" x 30"; 6 cold sheet mills (one 24" x 44", five 24" x 36"); 17 box annealing fur.; 4 Mesta pickling mach.; 8 galvanizing pots. Tin house: f. o. Aug. 30, 1913; 32 sets, 30 for coke tinplates, 2 for long terne plates. Fuel, coal. Product and annual cap., 400,000 tons ingots; 160,000 tons slabs and 240,000 tons sheet bars; 100,000 tons black sheets, 80,000 tons black plate; 60,000 tons hot rolled strip; 36,000 tons cold rolled strip; 1,800,000 base boxes tinplates and terne plates.

Liberty Works, Warren, Ohio: blt. 1917-18, f. o. May, 1918; 10 hot black plate mills, 28" x 34"; 8 cold mills, 4 double sets, 24" x 36" and 24" x 40"; 14 tinning stacks for coke tinplates. Fuel, pulverized coal. (Formerly owned by Liberty Steel Co., acquired by Trumbull Steel Co., July, 1, 1919). Product and annual cap.: 50,000 tons black plate, 500,000 base boxes tinplates.

TUNGSTEN PRODUCTS CO., 2031 Twelfth St., Boulder, Col.

Inc. Jan. 3, 1916 in Colorado. Capital stock: com. \$150,000.

Warren F. Bleecker, P. & G. M.; Jesse H. Holmes, Jr., Sc. & G. S. M.; L. C. Schultz, A. T.; at Boulder. H. Carey Morgan, V. P.; Morgan Belmont, T.; at New York, N. Y.

Works at 3rd & Pearl Sts., Boulder, Col.: blt. 1916, f. o. Sept., 1916; eight single-phase electric furnaces. Electric power from Colorado Power Co.

Product: ferro-tungsten, ferro-molybdenum, ferro-boron and ferro-vanadium, radium and radium products; annual cap., 600 tons.

Works at Boonton, N. J.: blt. 1916, f. o. 1917; electric furnace for manufacture of ferro-molybdenum. (Formerly owned by Atlantic Metal & Alloys Co.; acquired by Tungsten Products Co. in August, 1917, and abandoned in 1917.)

Tungsten Products Co. of Maryland, Baltimore, Md., built electric furnace plant for manufacture of ferro-alloys at Baltimore in 1916; sold plant to Morris Shapiro and John D. Roney, Pratt & Fremont Sts., Baltimore, Feb. 11, 1920.

TUNGSTEN STEEL CO. (The), Toledo, Ohio.

Anton Boerder, P.

Works at Toledo: two 500-lb. Heroult electric fur. installed and f. o. May, 1918.

Product: steel ingots for own use and for sale, tungsten alloy steel ingots; annual cap., 150 tons.

TURNBULL ELECTRO METALS, LTD., St. Catherines, Ont., Canada.

Inc. May 1, 1917 in Dominion of Canada. Capital stock: com. auth. \$50,000, issued \$26,000.

Robert Turnbull, P.; James B. Tudhope, V. P.; Charles W. Sim, Sc., T., G. S. M. & P. A.; H. L. Hatt, G. S.

Sales agents: A. C. Leslie & Co., Ltd., 560 St. Paul St., Montreal.

Works at St. Catherines, Ont.: one 5-ton 3-phase electric fur.

Product: low-phosphorus pig iron from scrap; annual cap., 6,500 tons.

TUTTLE, CHARLES W., Auburn, N. Y.

Charles W. Tuttle, Sole Owner & G. M.; N. L. Drummond, A. G. M.; George W. Brockway, Mill S.; Kirk Bowen, P. A.

Auburn Iron Works, Auburn: blt. 1853; two 2-d. coal heat. fur.; 10" 3-h. 4-st. merchant mill; one 7-ton ham. Fuel, bit. coal.

Product: double-refined merchant bar, horseshoe bar and staybolt iron; annual cap., 4,000 tons.

TWIN CITY FORGE & FOUNDRY CO., Stillwater, Minn.

Inc. Aug., 1917 in Minnesota. Capital stock: com. \$400,000.

George H. Atwood, P.; J. L. Record, V. P.; Edwin A. Merrill, Sc.; Robert S. Davis, T.; Fred F. Stoebe, A.; Melvin Ovestrud, G. S.; H. C. Gardner, G. S. M.; Robert De Forest, P. A.

Works at Stillwater, Minn.: one 6-ton Heroult electric fur. blt. 1918, f. o. June, 1918. Drop forging plant; 12 hammers up to 12,000-lb.

Product: steel ingots and general steel castings for sale and for own use, annual cap., 4,000 tons (2,500 tons ingots, 1,500 tons castings); brass and bronze castings; drop forgings.

TYLER TUBE & PIPE CO. (The), Washington, Pa.

Inc. 1890 in Pennsylvania. Capital stock: com. auth. \$1,000,000, issued \$527,100.

L. F. Doyle, P.; at New York, N. Y. C. A. Bumpus, V. P. & T.; E. Tyler Davis, Sc. & M. S.; C. P. Matheson, Works M.; at Washington, Pa.

Works at Washington, Pa. (owned): blt. 1890-91; five 3-d. heat. fur.; 18" 2-h. 3-st. bar; 18" 3-h. 3-st. grooved skelp mills; 18 knobbling fires; 2 ham. (6,000-lb.); 4 lap-weld fur. for tubes from $1\frac{1}{2}$ " to 6". Product: charcoal iron blooms for own use, knobbled charcoal iron bars, skelp, charcoal iron boiler tubes and lap-weld open hearth steel boiler tubes; annual cap., 15,000 tons blooms, 27,000 tons skelp, 5,000 tons special iron bars, 24,000 tons boiler tubes. Works at Principio Furnace, Md. (leased; owned by Whitaker Iron Co.): blt. 1883-84; 12 knobbling fires; 3 ham. (one 6,000-lb., two 4,000-lb.). Steam power. Product: charcoal blooms from scrap for own use; annual cap., 8,000 tons.

ULSTER IRON WORKS, 21 North Sussex St., Dover, N. J.

Inc. July 3, 1903 in New Jersey. Capital stock: com. \$400,000.
C. R. Mulligan, P.; John Mulligan, V. P. & G. M.; Frank W. Hamilton, A. G. M.; J. D. B. Vreeland, Sc. & T.; Thomas H. Smith, G. S.

Sales agents: Joseph T. Ryerson & Co., 30 Church St., New York, and 16th & Rockwell Sts., Chicago.

Works at Dover: 22 double puddling fur.; 4 squeezers (2 rotary, 2 alligator); 5 reheat. fur. (two 2-d., three 3-d.); 18" 2-h. 2-st. muck, 18" 3-h. 1-st. muck; 20" 3-h. 2-st. bar, 16" 3-h. 2-st. bar, 12" guide with 4-st. 3-h. and 1-st. 2-h., 10" guide with 3-st. 3-h. and 1-st. 2-h.

Product: muck bar, annual cap., 24,400 tons; merchant bar iron, annual cap., 24,000 tons.

UNION ELECTRIC STEEL CO., Elm & Kirkwood Sts., Carnegie, Pa.

Inc. Sept., 1916 in Delaware. Capital stock: com. \$2,000,000; pref. 8% cum. \$1,000,000.

James D. O'Neil, P. & G. M.; W. A. Emery, Sc. & P. A.; L. R. Murphey, T.; at Pittsburgh. H. E. Rowell, G. S.; at Carnegie, Pa.

Selling agents: Cleveland, Cleveland Steel Sales Co., 1364 West 3rd St. Works at East Carnegie, Pa.: blt. 1916-17, f. o. July, 1917; one 6-ton Heroult electric fur.

Product: steel ingots for sale; nickel, chrome and vanadium alloy steel ingots; annual cap., 5,000 tons.

UNION FURNACE CO. (The), 77 Carew Bldg., Cincinnati, Ohio.

Inc. Dec. 31, 1909 in Ohio. Capital stock: com. \$300,000.

J. K. Pollock, P.; D. B. Meacham, V. P.; H. E. Turner, Sc. & T.; at Cincinnati. W. M. Jeffreys, G. S.; at Hanging Rock, Ohio.

Selling agents: Rogers, Brown & Co., 77 Carew Bldg., Cincinnati.

Union Furnace, Ironton, Ohio: 1 stack, 70' x 15' 6", blt. 1873-74, last rebt. 1919; 4 Player iron pipe stoves; 2 steam blowing eng. (25,000 cfm.); 5 water-tube boilers, 1,700 H. P. By-product coke: Lake ore.

Product: basic, malleable and foundry pig iron, annual cap., 50,000 tons.

UNION IRON WORKS, 215 Montgomery Ave., Spokane, Wash.

Inc. 1898 in Washington. Capital stock: com. \$100,000.

E. J. Roberts, P.; Austin Corbin, V. P.; J. M. Fitzpatrick, Sc. & T.; T. E. McDonald, P. A.

Works at Spokane: blt. 1889; first converter steel, April, 1912; one 3,000-lb. Tropenas converter. Gray iron and brass foundry.

Product: steel castings, annual cap., 1,000 tons; gray iron castings, 3,800 tons.

UNION MOTOR TRUCK CO., Bay City, Mich.

Works at Bay City: installing in March, 1920 one 1½-ton Booth-Hall electric furnace to be completed about July 1, 1920.

Product: steel castings for own use and for sale, annual cap., 1,800 tons.

UNION ROLLING MILL CO. (The), East 82nd St. & Ætna Road, Cleveland, Ohio.

Inc. 1880 in Connecticut. Capital stock: com. \$600,000.

H. A. Fuller, P.; J. E. Kreps, V. P., T. & P. A.; M. L. Hopkins, Sc.; N. K. Hartford, G. S.

Selling agents: The Bourne-Fuller Co., Cleveland, Ohio.

Works at East 82nd St. & Ætna Road, Cleveland: blt. 1866-67; 5 single puddling fur.; 5 single scrap fur.; 6 heat. fur. (five 4-d. reverb., 1 continuous); 3 gas producers; 18" 3-h. 2-st. muck; 21" 3-h. 4-st. bar and structural; 18" 3-h. 3-st. bar; 14" 3-h. 1-st. Belgian roughing with 9" 3-h. 4-st. guide; 8" 3-h. 5-st. guide.

Product: merchant bar iron and steel, bolt, nut and rivet rods, bridge iron and shafting. Annual cap., 25,000 tons muck and scrap bar; 110,000 tons merchant bar.

UNION SPRING & MANUFACTURING CO., 1207 Fulton Bldg., Pittsburgh, Pa.

Inc. Sept. 8, 1902 in Pennsylvania.

Leonard G. Woods, P.; Albert Pancoast, V. P.; F. G. Kay, Sc.

Sales offices:

Baltimore, N. S. Kenney, 1014 Munsey Bldg.

Chicago, A. C. Woods, Fisher Bldg.

Louisville, J. W. Chandler, Todd Bldg.

New York, E. H. May, 50 Church St.

Philadelphia, D. R. Warfield, 510 Crozier Bldg.

Richmond, W. L. Jeffries, Jr., Mutual Bldg.

Washington, W. Newton Gulick, Wilkins Bldg.

Works at New Kensington, Pa.: blt. 1902; three 2-ton Tropenas converters; one 6-ton Heroult electric fur.; 1 cupola.

Product: steel castings for own use and sale up to 2,000-lb.; manganese and nickel alloy steel castings; wire, coil and elliptic springs, journal boxes and journal box lids. Annual cap., 10,000 tons converter steel castings and 5,200 tons electric steel castings.

UNION STEEL CASTING CO., 53 Gerard St., Boston, Mass.

Inc. Aug., 1910 in Maine. Capital stock: com. \$10,000.

James R. Nicholson, P.; A. F. S. Blackwood, V. P., G. M., P. A. & G. S.; E. M. Hamlin, T.; R. M. Belyea, Sc.; P. C. Rogers, G. S. M.

Sales offices: New Haven, R. B. Cole, 504 Colonial Bldg.; New York, Sheldon Co., 15 Park Row.

Former works at Jamaica Plain, Boston, destroyed by fire in 1916.

Works at 53 Gerard St., Boston (leased; owned by G. W. & F. Smith): two 2,000-lb. Tropenas converters; one 10-ton A. O. H. fur.; 2 cupolas; f. o. July 10, 1916.

Product: steel castings for sale, 1-lb. to 20,000-lb.; annual cap., 3,000 tons converter, 9,000 tons acid open-hearth castings.

UNION STEEL CASTING CO., 62nd & Butler Sts., Pittsburgh, Pa.

Inc. April 27, 1899 in Pennsylvania. Capital stock: \$2,500,000.

C. C. Smith, Ch.; J. P. Allen, P. & G. M.; J. B. Henry, V. P. & G. S.; S. H. Church, V. P.; W. C. Eichenlaub, Sc. & G. S. M.; G. W. Eisenbeis, T.; C. E. Gillispie, A.; H. C. Wickline, P. A.

Works at 62nd & Butler Sts., Pittsburgh: No. 1 Plant blt. 1899, No. 2 blt. 1911; five 25-ton A. O. H. fur.

Product: steel ingots and castings for sale, general machinery castings; vanadium, nickel and chrome alloy steel ingots and castings; annual cap., 54,000 tons (18,000 tons ingots; 36,000 tons castings.)

UNION TOOL CO., Torrance, Cal.

Inc. May 8, 1908. Capital stock: com. auth. \$1,250,000, issued \$725,000; pref. 7% cum. auth. \$1,250,000, issued \$828,200; bonds \$263,000.

Edward Double, P. & G. M.; P. N. Boggs, V. P. & G. S. M.; W. A. Doble, V. P.; P. W. Masten, Sc. & T.; at Torrance, Cal. R. M. Goldsborough, V. P.; at Chicago, Ill.

Works at Torrance: one 8-ton B. O. H. fur.; one 1-ton Heroult electric fur. (idle); one 3-ton Heroult electric fur.; 500-ton forging press; 12 steam ham. (100-lb. to 7,500-lb.); 3 cupolas; gray iron foundry.

Product: steel ingots and castings chiefly for own use, nickel and chrome alloy steel ingots and castings; annual cap., 5,500 tons ingots (3,000 basic, 2,500 tons electric), 2,500 tons castings (1,500 basic, 1,000 electric); gray iron castings 18,000 tons. Oil well equipment; oil, gas and steam engines; metal barrels.

UNITED ALLOY STEEL CORPORATION, Eighth St. Ext., Canton, Ohio.

Inc. 1916 in New York. Formerly known as The United Steel Co. (incorporated 1903 in Ohio); succeeded by United Alloy Steel Corporation, Oct. 25, 1916. Capital stock: com. 525,000 shares, no par value.

Harry R. Jones, P.; E. L. Hang, V. P., T. & G. M.; J. Paul Moseley, Sc.; Homer Giessen, A. Sc.; W. W. Worlock, A.; J. A. Buell, A. G. M.; H. C. Thomas, G. S.; J. B. Thorpe, A. G. S.; H. H. Pleasance, G. S. M.; George W. Starr, P. A.

Sales offices:

Chicago, Marquette Bldg.

Cleveland, Swetland Bldg.

Detroit, Ford Bldg.

Indianapolis, Ind.

New York, City Investing Bldg.
Philadelphia.
Syracuse.
San Francisco.

Works at Canton, Ohio: blt. 1903-04, f. o. July, 1904; 19 B. O. H. fur. (one 35-ton tilting, three 60-ton, two 75-ton, thirteen 85-ton); 3 Heroult electric fur. (one 6-ton, two 15-ton); 300-ton mixer; nine 4-hole soaking pits; 7 cont. heat. fur.; 35" 2-h. 1-st. reversing blooming; 26" 2-h. Lamberton billet and jobbing mill; 20" 3-h. 5-st. bar; 18" 2-h. 6-st. Morgan cont. sheet bar and billet; 14" 3-h. 1-st. roughing and 10" 3-h. 4-st. bar; 14" 3-h. 1st. and 9" 3-h. 4-st. bar; Morgan cont. merchant mill with 12" 2-h. 6-st., 10" 2-h. 4-st., 8" 2-h. 2-st. and 7½" 2-h. 4-st.; 48" universal plate mill for plates ⅜" and thicker, 12" to 42" wide, slitter for narrower plates; 6 heat treating and 4 annealing fur.; 4 pickling tanks for long bars; one 3,000-lb. ham.; one 500-ton hydraulic press.

Product: steel ingots, alloy steel ingots; forging ingots and billets, sheet bars; universal plates; bars; piston rods, pistons, shafting, heat-treated and cold-drawn products. Annual cap., 636,000 tons ingots, 360,000 tons sheet bars, 400,000 tons finished hot rolled products, 1,200 tons forged products, 35,000 tons heat treated steel, 35,000 tons cold drawn straightened and cut products.

UNITED ENGINEERING & FOUNDRY CO., Farmers Bank Bldg., Pittsburgh, Pa.

Inc. June 25, 1901 in Pennsylvania. Capital stock: com. auth. \$5,000,000, issued \$4,523,700; pref. 7% cum. auth. \$2,500,000, issued \$1,841,800.

Isaac W. Frank, Ch.; F. C. Biggert, Jr., P.; G. G. Small, 1 V. P.; William Gardner, 2 V. P.; C. E. Satler, Sec. & G. S. M.; Edward Kneeland, T. & G. M.; George H. Friesel, A.; H. A. Grusch, P. A.

Product: standard tools; special and general machinery; rolling mill machinery, rolls and steel castings up to 50 tons.

The company operates the following works:

American Roll & Foundry Co. Dept., Canton, Ohio.
Lloyd Booth Co. Dept., Youngstown, Ohio (2 plants).
Wm. Tod Co. Dept., Youngstown, Ohio.
Chilled Roll Foundry Co. Dept., Vandergrift, Pa.
Lincoln Foundry Co. Dept., Pittsburgh, Pa.
Frank-Kneeland Machine Co. Dept., Pittsburgh, Pa.
McGill & Co. Dept., Pittsburgh, Pa.

Steel castings are made only at Vandergrift.

Chilled Roll Foundry Co. Dept., Vandergrift, Pa.: 3 Swindell A. O. H. fur. (one 10-ton, two 35-ton). Fuel, nat. gas.

Product: steel castings for sale and for own use; nickel, chrome and vanadium alloy steel castings; annual cap., 24,000 tons.

UNITED FURNACE CO. (The), 600 Western Reserve Bldg., Cleveland, Ohio.

Inc. July 22, 1915 in Ohio. Capital stock: com. \$2,000,000; bonds \$400,000.

H. G. Dalton, P.; E. P. Williams, T.; H. S. Pickands, P. A.; at Cleveland. Harry R. Jones, V. P.; E. L. Hang, Sc.; C. F. Kaufholz, G. S.; at Canton, Ohio.

Sales agent: Pickands, Mather & Co., 600 Western Reserve Bldg., Cleveland, Ohio.

Brand: "United."

United Furnace, Canton, Ohio: 1 stack, 90' x 22', blt. 1915-16, blown in Nov. 23, 1916; three 2-pass side-combustion stoves, 110' x 24'; 2 steam blowing eng. (150,000 cfm.); 7 water-tube boilers, 5,376 H. P.; one Uehling double-strand casting machine. By-product coke: Lake ore. By-product coke plant with 47 Koppers cross regenerative ovens, annual cap., 180,000 net tons. By-product recovery plant. Koppers benzol plant, annual cap., 1,000,000 gals. light oil.

Product: basic pig iron, annual cap., 160,000 tons.

UNITED IRON & STEEL CO., Leader News Bldg., Cleveland, Ohio.

Inc. Nov. 27, 1906 in Pennsylvania. Capital stock: com. auth. \$2,000,000, issued \$1,950,000.

F. B. Richards, P.; C. N. Osborne, V. P.; R. E. McMahon, V. P.; L. C. Hanna, V. P.; G. M. Humphrey, Sc.; S. W. Folsom, T.; L. R. Close, A.; C. W. Brown, A. Sc. & A. T.; P. J. Moran, G. M.; H. H. Foote, G. S.; C. K. Sheridan, P. A.

Selling agents: M. A. Hanna & Co., Cleveland, Ohio.

Brands: "Cherry Valley" and "Fannie."

Cherry Valley Furnace, Leetonia, Ohio: 1 stack, 80' x 20', last rebt. 1919; 4 McClure stoves, 85' x 21'; 3 steam blowing eng. (50,000 cfm.); 8 water-tube boilers, 3,122 H. P.; one Pittsburgh Coal Washer Co. single-strand casting machine; Greenawalt sintering plant for flue dust, annual cap., 20,000 tons. Beehive coke: Lake ore. Coke plant, 203 beehive coke ovens at the furnace, annual cap., 170,000 net tons.

Product: foundry and malleable pig iron; annual cap., 140,000 tons.

Fannie Furnace, West Middlesex, Pa.: 1 stack, 80' x 18' 8"; last rebt. 1918; 4 McClure stoves, 70' x 21'; 2 steam blowing eng. (40,000 cfm.); 8 water-tube boilers, 2,900 H. P.; one Pittsburgh Coal Washer Co. single-strand casting machine. Coke: Lake ore.

Product: malleable, basic and bessemer pig iron, annual cap., 110,000 tons.

Company owns a controlling interest in the Pittsburgh Iron Ore Co., which operates mines in the Mesabi Range.

United States Cast Iron Pipe & Foundry Co., Burlington, N. J., see

1916 Directory, p. 329, owns Scottdale Furnace, Scottdale, Pa., operated under lease by McKinney Steel Co., Cleveland, Ohio.

United States Electric Steel Co., incorporated in Pennsylvania in 1916, built a plant at Connellsville in 1916-17 with one 8-ton electric fur. Construction of a rolling mill (billet mill and 78" plate mill) was planned, construction began in Dec., 1916, but was soon afterwards stopped. Company went into involuntary bankruptcy Mar. 15, 1918, and A. C. Ellis, F. E. Markell and G. M. Gadsby were appointed receivers. The receivers leased the plant to Jessop Steel Co., in July, 1918. Plant sold at receivers sale Oct. 28, 1919; sale confirmed by court in February, 1920, and the Connellsville Electric Steel Company was formed in March, 1920, to take over the property.

Works at Connellsville: blt. 1916-17; one 10-ton Gronwall-Dixon electric fur. (leased to Jessop Steel Co., July 1 to Dec. 31, 1918). Product: steel ingots, annual cap., 7,500 tons.

UNITED STATES FERRO ALLOYS CORPORATION, 30 East 42nd St., New York, N. Y.

Inc. 1919 in New York. Capital stock: com. \$3,000,000.

Parker Sloane, P.; John W. Fraser, V. P.; H. C. Sicard, Sec. & T.; J. M. Dowling, A.; at New York. Robert Turnbull, Managing Director; Howard I. Wheat, G. S.; at Niagara Falls, N. Y.

Works at Niagara Falls, N. Y.: ferro-alloys first made 1919. Electric power from Niagara Falls.

Product: high and low carbon ferro-chrome; ferro-silicon (10 to 75%) and other alloys.

UNITED STATES GOVERNMENT, War Department.

Ordnance Dept., Watertown Arsenal, Watertown, Mass.: one 5,000-lb. Tropenas converter; 3 A. O. H. fur. (one 15-ton, two 35-ton); 3 Heroult electric fur. (one 2-ton, two 6-ton); three 8-pot crucible fur.; 2 cupolas; 4 hydraulic forging presses (800-ton, 1,000-ton, two 2,000-ton); one 10,000-lb. steam ham.; one 2,000-ton horizontal Hadfield press; one nosing in press; 20 heat. fur.; 17 annealing fur.; 12 large heat treating fur. Gray iron, semi-steel, brass, bronze and aluminum foundry.

Product: steel castings for Government ordnance work only; annual cap., 1,800 tons converter, 41,000 tons open hearth, 15,600 tons electric, and 250 tons crucible steel ingots and castings; alloy steel ingots and castings; gun and commercial forgings, annealed, rough machined and heat treated up to 30 tons forged weight; shell caps, wind shields, armor piercing and deck piercing projectiles, high explosive shells; complete gun carriages for calibers up to 16".

UNITED STATES GOVERNMENT, Navy Department.

Navy Yard, Boston, Mass.: one 2-ton Tropenas converter, installed 1917, f. o. Mar. 5, 1917; one 8-pot crucible fur.; 2 cupolas. Prod-

uct: steel castings, annual cap., 1,200 tons converter, 50 tons crucible steel castings.

Navy Yard, Brooklyn, N. Y.: converters dismantled.

Navy Yard, Charleston, S. C.: one 2-ton Stoughton converter; 1 cupola. Product: steel castings, annual cap., 1,200 tons.

Navy Yard, Mare Island, Cal.: one 2-ton Tropenas converter; 1 cupola; blt. 1908; f. o. May 20, 1908; one 6-ton Greaves-Etchells electric fur. installed 1918-19, f. o. April 7, 1919. Product: steel castings, annual cap., 1,200 tons converter, 1,800 tons electric steel castings.

Navy Yard, Norfolk, Portsmouth, Va.: one 2-ton Tropenas converter; 1 cupola; blt. 1913, f. o. Oct. 9, 1913; one 6-ton Greaves-Etchells electric fur., blt. 1919, f. o. Oct. 21, 1919. Product: steel castings, annual cap., 1,000 tons converter, 3,000 tons electric steel castings.

Navy Yard, Philadelphia, Pa.: 8-pot crucible steel fur., blt. 1911-12, f. o. Jan., 1912; one 3-ton Greaves-Etchells electric fur. blt. 1918-19, f. o. July 2, 1919. Product: steel castings, annual cap., 65 tons crucible and 1,800 tons electric steel castings.

Navy Yard, Puget Sound, Bremerton, Wash.: one 6-ton Greaves-Etchells electric fur. blt. 1918, f. o. Aug. 24, 1918; one 1-ton Whiting converter, 1 cupola. Product: steel castings, annual cap., 600 tons converter, 900 tons electric steel castings.

Navy Yard, Washington, D. C. (Naval Gun Factory): two 5,000-lb. Tropenas converters, blt. 1914; one 20-ton A. O. H. fur., f. o. May 21, 1914; one 6-ton Heroult electric fur., blt. 1918, f. o. Mar. 1918; 4 cupolas; ferro melted in crucibles. Hammers and hydraulic press. Gray iron, semi-steel and brass and bronze foundry. Product: steel ingots and castings, alloy steel ingots and castings; annual cap., 14,500 tons castings (3,000 tons converter, 7,500 tons open hearth, 4,000 tons electric); 10,500 tons ingots (7,500 open hearth, 3,000 electric); 12,000 tons gray iron castings, 4,000 tons non-ferrous castings.

Ordnance Plant, South Charleston, W. Va.: 2 B. O. H. fur. (65-ton) for duplexing with electric fur.; const. begun Oct., 1919; to be completed July, 1920; three 6-ton Heroult electric fur. blt. 1918; f. o. June, 1918; building two 30-ton Heroult electric fur.; 2 cupolas; 2 hydraulic forging presses (500-ton, 3,000-ton); 14,000-ton forging and bending press for armor plate to be added in 1920. Product and annual cap.: 50,000 tons ingots for guns and armor plate, 500 tons castings, 50,000 tons gray iron and semi-steel, and 850 tons brass castings; 23,800 tons forgings.

UNITED STATES HIGH SPEED STEEL & TOOL CORPORATION,
489 Fifth Ave., New York, N. Y.
Inc. Oct. 15, 1919 in New York. Capital stock: 150,000 shares,
no par value.

D. H. Friedman, P.; Jean V. Wolkenstein, 1 V. P.; Lawrence J. Ollesheimer, V. P.; Frank A. McNamee, T.
Works at Green Island, Albany Co., N. Y.: blt. 1919; two 1,000-lb. Rennerfelt electric fur. Hydro-electric power. Machine shops for finishing tools.

Product: high speed tool steel, annual cap., 500 tons; high speed tools, milling cutters, drills, reamers, etc.

UNITED STATES HORSE SHOE CO., Marine Bank Bldg., Erie, Pa.
Inc. Sept. 30, 1904 in Pennsylvania. Capital stock: com. auth. \$750,000, issued \$385,000; bonds \$300,000.

L. A. McElroy, P.; B. S. Fletcher, V. P.; H. H. Hanchett, Sc.; J. S. Curtis, T.; G. F. Marshall, G. S.

Works on East Lake Erie Road, Erie: blt. 1904-05, f. o. Mar. 16, 1905; 4 heat. fur. (three 3-d., one 4-d.); 6 small reheat. fur.; 16" 3-h. 4-st. billet, 9" 3-h. 3-st. and 9" 3-h. 5-st. guide mills. Fuel, coal. Machine shop for own use.

Product: billets for own use and horseshoe bars for own use and for sale, annual cap., 10,000 tons billets, 15,000 tons bars. Horse and mule shoes, annual cap., 250,000 kegs.

UNITED STATES RAIL CO., Williams St. and B. & O. R. R., Cumberland, Md.

Inc. 1902 in Maryland. Capital stock: com. \$150,000; pref. auth. \$150,000, all retired in 1917.

Henry Shriver, P.; H. E. Weber, 1 V. P.; W. M. Roberts, Jr., 2 V. P.; T. F. Shannon, Sc., T. & P. A.; L. C. Milholland, G. M. Cumberland Rolling Mill, Cumberland, Md. (leased; owned by Baltimore & Ohio R. R.): 2 cont. heat. fur.; two 24" 3-h. 2-st. rail mills. Fuel, bit. coal and nat. gas.

Product: rerolled rails, 8-lb. to 40-lb. sections inclusive, annual cap., 60,000 tons.

UNITED STATES STEEL CORPORATION, 71 Broadway, New York, N. Y.

Inc. Feb. 25, 1901. Capital stock: com. auth. \$550,000,000; issued \$508,302,500; pref. 7% cum. auth. \$550,000,000, outstanding \$360,281,100; bonds outstanding Dec. 31, 1919, \$407,102,000; subsidiary companies' bonds outstanding Dec. 31, 1919, \$161,625,932.

Elbert H. Gary, Ch.; James A. Farrell, P.; David G. Kerr, V. P.; John Reis, V. P.; Richard V. Lindabury, General Counsel; Richard Trimble, Sc. & T.; William J. Filbert, C.; William R. Walker, A. P.; John Hughes, A. P.

Corporate offices in New Jersey: 51 Newark St., Hoboken, N. J.
The corporation does not operate directly any iron and steel works. It controls directly or indirectly through its subsidiaries by ownership of the capital stock the following principal operating companies:

- * Carnegie Steel Co.
 - * Illinois Steel Co.
 - * American Steel & Wire Co.
 - * American Sheet & Tin Plate Co.
 - * National Tube Co.
 - * The National Tube Co. of Ohio.
 - * American Bridge Co.
 - * Minnesota Steel Co.
 - * The Lorain Steel Co.
 - * Tennessee Coal, Iron & Railroad Co.
 - * Canadian Steel Corporation.
 - Chickasaw Shipbuilding & Car Co.
 - Federal Shipbuilding Co.
 - Universal Portland Cement Co.
 - * Edgar Zinc Co.
 - * United States Steel Products Co.
 - * H. C. Frick Coke Co. ; also allied coal and coke companies.
 - * Oliver Iron Mining Co.
 - Duluth & Iron Range R. R.
 - Duluth, Missabe & Northern Ry.
 - Elgin, Joliet & Eastern Ry.
 - Chicago, Lake Shore & Eastern Ry.
 - Union R. R.
 - Bessemer & Lake Erie R. R.
 - * Pittsburgh Steamship Co.
- Various iron mining, coal, limestone, railway, land, natural gas, and dock companies.
- * These subsidiaries are described in the alphabetic list under the title of the respective companies.

UNITED STATES STEEL PRODUCTS COMPANY, 30 Church St., New York, N. Y.

Org. Nov. 10, 1898 ; inc. Oct. 6, 1903, as United States Steel Products Export Co. ; corporate title changed Aug. 1, 1910. Subsidiary of the United States Steel Corporation.

E. P. Thomas, P. ; T. P. Alder, T. ; W. A. Sweet, A. ; at 30 Church St., New York. Thomas Murray, Sc. ; at 71 Broadway, New York. A. T. DeForest, V. P. ; at Rialto Bldg., San Francisco.

Sales offices :

Adelaide, South Australia.

Antwerp, Belgium, 25 Rue de Londres.

Barcelona, Spain, Plaza Cataluna 16.

Batavia, Java, Kali Besar, West.

Birmingham, England, Lloyds Bank Chambers, New St.

Bombay, India, Queens Mansions, 56 Bastion Road.

Brussels, Belgium, 14 Rue van Orley.

Buenos Aires, Argentina, 544 Bartolome Mitre.

Calcutta, India, McLeod House, 28 Dalhousie St.
 Cape Town, South Africa, African Life Bldg.
 Christiania, Norway, Dronninges Gate 22.
 Concepcion, Chile, Calle Barros Arana No. 231.
 Genoa, Italy, Via delle Fontane 8.
 Glasgow, Scotland, 86 St. Vincent Street.
 Havana, Cuba, 419 Edificio del Banco Nacional de Cuba.
 Johannesburg, South Africa, Consolidated Bldg.
 Lima, Peru, Calle Carabaya (Coca) No. 448.
 London, England, Egypt House, 36 New Broad St., E. C.
 Los Angeles, Cal., Central Ave. & Jackson St.
 Mexico City, Mexico, Edificio de la Mutua.
 Montreal, Canada, Bank of Ottawa Bldg.
 New Glasgow, Nova Scotia, Head of Prospect St.
 New Orleans, La., Maison Blanche Building Annex.
 Paris, France, 11 Rue Edouard VII.
 Petrograd, Russia, Gogol Str. 19.
 Portland, Ore., Selling Bldg.
 Rio de Janeiro, Brazil, 42 Rua Candelaria.
 Rotterdam, Holland, 19-A Schiedamsche Singel.
 San Francisco, Cal., Rialto Bldg.
 Santiago, Chile, Edificio de la Bolsa de Comercio.
 Sao Paulo, Brazil, Rua Alvarez Penteado, 35.
 Seattle, Wash., 1054 Fourth Ave.
 Shanghai, China, Union Insurance Bldg., No. 4 The Bund.
 Soerabaya, Java, Chineesche Voorstraat, No. 17.
 Sydney, New South Wales, 14 Martin Place.
 Talcahuano, Chile.
 Tokio, Japan, 15 Nakadori, Marunouchi.
 Toronto, Ontario, Canada, Royal Bank Bldg.
 Valparaiso, Chile, Calle Blanco, No. 705.
 Vancouver, Canada, 846 Beach Ave.
 Winnipeg, Canada, Trust & Loan Bldg.

This company does not manufacture products of any kind, but sells for export and for shipment to Pacific Coast territory, the products of the following subsidiary companies of the United States Steel Corporation: Carnegie Steel Company, Illinois Steel Company, Lorain Steel Company, National Tube Company, Minnesota Steel Company, American Sheet and Tin Plate Company, American Steel and Wire Company, American Bridge Company, and the Tennessee Coal, Iron and Railroad Company.

LIST OF PRODUCTS EXPORTED.

The United States Steel Products Company exports coal, coke, pig iron, ferro-manganese, bessemer and basic open hearth steel billets, slabs, sheet and tinplate bars, and skelp.
 Steel rails, splice bars, bolts, nuts, spikes, and other accessories;

crossings, frogs, switches, and other special work for steam and electric railways; also copper rail bonds and tubular poles.

Beams, channels, angles, tees, zeos, and other structural shapes; steel plates for shipbuilding, tanks, boilers, etc.; flange and fire-box steel; black, galvanized, and painted steel sheets, flat and corrugated; range steel, tack plate; locomotive jacket iron; patent planished sheet iron, etc.; and steel hoops and cotton ties.

Merchant bars, rounds, squares, flats, ovals, hexagons, and other bar shapes; special iron and steel for bolts, rivets, shafting and other purposes; cold drawn bars (rounds, squares, flats, hexagons, and other shapes) for screw making and other manufacturing purposes; forged axles for locomotives, railway and tramway cars; and forgings for machinery and special purposes; steel wheels for railway and tramway cars; oil well derricks, steel mine timbers, steel sheet piling.

Black and galvanized wrought merchant pipe for gas, water, steam and other purposes; mild steel and charcoal iron boiler tubes for stationary, locomotive, and marine work; casing, tubing, and drive pipe for oil and artesian wells; gas and oil line pipe; lap-welded and seamless cylinders for compressed air, carbonic acid gas, anhydrous ammonia, etc.; Converse and Matheson lead joint pipe for water and gas mains; seamless tubes, shrapnel, projectiles and miscellaneous forgings.

Wire rods; cold rolled flat wire, drawn steel wire of every description; barb wire; plain, galvanized, and varnished fence wire; woven wire fencing; fence staples; netting and weaving wires; mattress, broom and bottling wires; galvanized telegraph and telephone wires; copper wires; and electrical wires. Fabric for reinforcing concrete.

Wire nails and wire tacks; wire bale-ties; wire hoops; wire rope, cables, and hawsers; wire sash cords and clothes lines; wire rope tramways and cable hoist conveyors; and horse and mule shoes.

Tinplates—coke, charcoal and terne; black plates for tinning, stamping, enameling, and other purposes.

Designs and estimates submitted for bridges and steel buildings, erected complete or prepared ready for erection.

United Steel Co., Canton, Ohio, see 1916 Directory, p. 334, succeeded by United Alloy Steel Corporation, October 25, 1916.

UNITED STEEL CO., P. O. Box 720, Everett, Wash.

C. J. Witney, P.; Jacob Authes, V. P.; F. R. Gabel, Sc.; G. W. Mumaw, T.

Works at Lowell, Wash.: building 12' 3-h. 5-st. motor driven merchant bar mill; one 4-d. oil-fired scrap reheating fur.

Product: merchant bars, rounds, squares, flats, angles, tees, channels, concrete bars, and special shapes.

Universal Rolling Mill Co., Bridgeville, Pa., see 1916 Directory, p. 335; corporate name changed to Universal Steel Co., May 31, 1919.

UNIVERSAL STEEL COMPANY, Bridgeville, Pa.

Inc. 1908 in Pennsylvania. Formerly known as Universal Rolling Mill Co.; name changed to Universal Steel Co., May 31, 1919. Capital stock: com. auth. \$3,000,000, issued \$363,000.

Harry B. Duncan, P.; N. R. Baker, V. P.; at Washington, Pa. Walter H. Baker, Sc., T. & G. M.; J. Howard Blair, A.; John A. Coyle, G. S.; H. H. Scovil, G. S. M.; F. K. Fawcett, P. A.; at Bridgeville.

Sales agent: John W. Stockton, 556 The Rookery, Chicago.

Bridgeville Works, Bridgeville, Pa.: blt. 1908-09, first rolled products, March, 1909; one 30-pot crucible fur.; three 6-ton Heroult electric fur.; 13 heat. fur. (eight 1-d., four 2-d., one 3-d.); 26" shovel plate mill with 32" x 66" 2-h. roughing stand and two 26" x 32" 2-h. finishing stands; 28" x 68" 2-h. 1-st. jobbing plate mill; 8 hot black sheet mills (two 26" x 44" roughing, six 26" x 32" finishing). Product and annual cap.: 20,000 tons steel ingots (18,000 tons electric, 2,000 tons crucible); carbon and alloy tool steel plates, sheets, bands, discs, etc.; saw, plow, spring and shovel steel, 40,000 tons.

Charleroi Works, Charleroi, Pa.: two 24-pot crucible fur.; one 6-ton Heroult electric fur.; 5 heat. fur. (three 3-d., two 4-d.); 16" 2-h. and 3-h. 3-st. bar mill; 10" 2-h. and 3-h. 5-st. bar mill; 5 steam hammers (800-lb. to 8,000-lb.). (Formerly owned by Hussey-Binns Steel Co.; acquired by Universal Rolling Mill Co., May 13, 1918). Product and annual capacity: 9,500 tons steel ingots (6,000 tons electric, 3,500 tons crucible); 18,000 tons carbon and alloy tool steel bars (15,000 tons rolled, 3,000 tons hammered.) Works acquired June 15, 1920, by The Electric Alloy Steel Co., Youngstown, Ohio. See addenda.

UPSON NUT CO. (The), 1912 Scranton Road, Cleveland, Ohio.

Inc. Dec. 1911 in Ohio. Capital stock: com. \$5,000,000.

H. A. Fuller, P.; L. H. Elliott, 1 V. P. & Sc.; F. H. Chapin, V. P. in charge of operations; B. F. Bourne, T.; F. H. Ulmer, A.; A. H. Preston, P. A.; at Cleveland. W. A. Hitchcock, V. P.; at Unionville, Conn.

Sales offices:

Atlanta, Ga., V. A. Moore & Co., Healey Bldg. (agents).

Chicago, McCormick Bldg.

Denver, Duncan Bond, Colorado National Bank Bldg. (agent).

El Paso, Texas, Lippincott, Beall & Co. (agents).

New York, 17 Battery Place.

San Francisco, Call Bldg.

Product: bolts, nuts, rivets and carriage hardware; steel billets, slabs and bars.

Upson Furnace, Cleveland: 1 stack, 65' x 16' 9", last rebt. 1912; 4 Foote stoves, 75' x 19'; 3 steam blowing eng. (30,000 cfm.);

7 water-tube boilers, 17,500 H. P.; one Heyl & Patterson single-strand casting machine; slag granulating pit. Conn. coke: Lake ore. Product: basic pig iron for own use, annual cap., 82,000 tons.

Upson Steel Works, Cleveland: blt. 1910-11; five 70-ton B. O. H. fur.; four 16-ingot and four 8-ingot soaking pits with 10 gas prod.; 2 Morgan cont. heat. fur. with 3 gas prod.; 34" 2-h. 1-st. blooming; semi-continuous mill with 14" 8-st. cont., 11" 3-st. and 8" 2-st. looping. First O. H. ingots and blooms made Apr. 10, 1911, first bars June 17, 1911. Product: ingots, blooms, billets and bars for own use and for sale. Annual cap., 200,000 tons ingots, 175,000 tons blooms and billets, 120,000 tons finished rolled products.

Bolt and Nut Works (2 plants at Cleveland, Ohio and Unionville, Conn.). Product and annual cap., bolts, nuts (370,000 kegs); rivets (215,000 kegs).

Utah Iron & Steel Co., Midvale, Utah, see 1916 Directory, p. 336, was consolidated with Utah Junk Co., Jan. 1, 1919, both companies being merged in the Utah Steel Corporation.

UTAH STEEL CORPORATION, Salt Lake City, Utah.

Inc. Jan. 1, 1919 in Utah. Capital stock: com. auth. \$1,750,000, issued \$1,120,000; pref. 7% cum. auth. \$750,000, none issued. C. W. Whitley, P.; at 120 Broadway, New York. N. Rosenblatt, V. P.; S. Rosenblatt, Sc.; M. H. Sowles, T.; M. S. Rosenblatt, G. M.; H. G. Parcell, G. S. M.; W. C. Schmidt, P. A.; at Salt Lake City.

Sales offices: Salt Lake City, 910 Boston Bldg.; San Francisco, C. W. Pike & Co.; Portland, Ore., Marshall Wells Co.

Works at Midvale, Utah: blt. 1914-15; two 45-ton B. O. H. fur.; first steel made, Nov. 1, 1917; 1 cont. ingot heat. fur., 1 gas producer; 2 coal-fired 4-d. heat. fur.; 22" 3-h. 2-st. billet mill; 16" 3-h. 3-st. bar and 10" 3-h. 5-st. guide mills. Plan to add in 1920, one cont. billet heat. fur. and 8" merchant mill.

Product: merchant bars, concrete reinforcing bars, light structural shapes, bolt and rivet rods; annual cap., 50,000 tons ingots, 50,000 tons billets, 40,000 tons finished rolled products.

VALLEY MOULD & IRON CORPORATION, Sharpsville, Pa.

Inc. Mar. 2, 1917 in New York. Capital stock: com. 100,000 shares, no par value; pref. 7% cum. \$2,000,000; bonds \$2,250,000. Formerly Valley Mould and Iron Co.; succeeded by Valley Mould & Iron Corporation, March, 1917.

John E. Perry, P.; Hugh J. Garvey, V. P., Sc. & G. S. M.; Harry H. Cook, V. P.; J. W. Gault, A.; A. E. Abel, G. S.; M. J. McDowell, P. A.; at Sharpsville. Henry Lockhart, Jr., V. P.; at 60 Broadway, New York. R. S. Crawford, T.; at First National Bank, Cleveland, Ohio.

Sales office: Pittsburgh, Ralph C. Velte, 509 Oliver Bldg.

Alice Furnace, Sharpsville: 1 stack, 75' x 15'; blt. 1868, last remod. 1897, relined 1918; 4 Pollock iron pipe stoves; 3 steam blowing eng. (41,000 cfm.); 6 water-tube boilers, 2,595 H. P.; slag granulating pit, annual cap., 103,000 tons. Conn. coke: Lake ore. Ingot mould foundry.

Product: basic pig iron, annual cap., 108,000 tons.

The company operates foundries as follows:

Sharpsville Foundry, Sharpsville, Pa. Product: ingot moulds, annual cap., 350,000 tons.

Josephine Works, Black Lick, Pa. Product: ingot moulds, annual cap., 180,000 tons.

West Middlesex Works, West Middlesex, Pa. Product: ingot moulds, annual cap., 90,000 tons.

Pittsburgh Works, Pittsburgh, Pa. Product: Ingot moulds and castings, annual cap., 50,000 tons ingot moulds, 25,000 tons gray iron castings.

VAN ALLEN & CO., Northumberland, Pa.

Partnership, est. 1866, reorganized, Sept. 23, 1913.

Northumberland Iron & Nail Works, Northumberland, Pa.: blt. 1883, two 2-d. heat. fur.; 20" 3-h. nail plate mill with roughing stand, bull heads and finishing stand; 43 cut nail machines.

Product: iron and steel cut nails, annual cap., 100,000 kegs.

VANADIUM ALLOYS STEEL CO., Latrobe, Pa.

Inc. June, 1910 in Pennsylvania. Capital stock: com. \$300,000.

Roy C. McKenna, P.; Wm. S. Jones, V. P.; F. P. Underwood, Sc.; Joseph E. Barnett, T.; D. T. Sipe, G. M. & P. A.; C. R. Sipe, G. S.; at Latrobe. C. H. McKenna, V. P.; H. N. Surrey, G. S. M.; at Pittsburgh, Pa.

Branch offices and warerooms:

Buffalo	Detroit (warerooms)
Boston	New York
Cleveland	Philadelphia
Chicago (warerooms)	Pittsburgh
Cincinnati	Toronto, Ontario

Works at Latrobe: two 6,000-lb. Heroult electric fur.; two 30-pot crucible fur., f. o. July 7, 1910; 8 heat. fur. (one 1-d., four 2-d., three 3-d.); 2 annealing fur.; 12" 3-h. 5-st. bar mill; 10" 3-h. 5-st. bar mill; 5 ham. (2,500-lb. to 8,000-lb.). Plant for manufacture ferro-tungsten, f. o. 1914, 36 brick electric fur., annual cap., 700 tons ferro-tungsten.

Product: steel ingots, annual cap., 6,500 tons electric, 3,600 tons crucible steel ingots; chrome, tungsten and vanadium alloy steel ingots; tool steels, high speed steel.

VANADIUM CORPORATION OF AMERICA, 120 Broadway, New York, N. Y.

Inc. Sept. 6, 1919 in Delaware. Formerly known as American Vanadium Co.; succeeded by Vanadium Corporation of America, Sept., 1919.

J. Leonard Replogle, P.; M. G. Baker, V. P. & G. M. S.; E. F. Nickerson, Sc.; L. K. Diffenderfer, T.

Sales office: 120 Broadway, New York.

Plant at Kirwan, Pa. (R. R. Station, Bridgeville): ferro-alloys first made May, 1908; 2 special type electric fur.; alumino-thermic process also used. Fuel, coal and gas. Electric power from Duquesne Light Company, Pittsburgh, Pa.

Product: ferro-vanadium, alumino-vanadium, cupro-vanadium, annual cap., 5,000 tons.

Plant at Primos, Pa.: blt. 1899, f. o. Feb. 11, 1899; 3 induction type electric fur.; also wet process and smelting. Steam and electric power. Electric power from Delaware County Electric Co. (Formerly owned by Primos Chemical Co.; acquired by the Vanadium Corporation of America, Jan. 1, 1920.)

Product: tungsten metal, molybdenum metal, ferro-tungsten, ferro-molybdenum, ferro-vanadium; oxides and salts of tungsten, molybdenum and vanadium.

VANCOUVER ENGINEERING WORKS, Ltd., 519 Sixth Ave. West, Vancouver, B. C., Canada.

Inc. April, 1901 in Dominion of Canada. Capital stock: com. auth. \$875,000, issued \$562,015; pref. 6% cum. auth. and issued \$125,000.

Charles Lancaster, P.; at 14 Dale St., Liverpool, England. Eric Davies, Sc. & T.; George Giles, G. M.; W. G. Davidson, G. S.; at Vancouver.

Works at Vancouver: one 2-ton Whiting converter; 3 cupolas.

Gray iron foundry. Installing one 1-ton Greaves-Etchells electric fur.; annual cap., 1,250 tons.

Product: steel castings for sale; nickel and chrome alloy steel castings; annual cap., 1,200 tons. Gray iron and semi-steel castings, 2,000 tons.

VANCOUVER ROLLING MILLS CO., Ltd., Eburne, Vancouver, B. C., Canada.

Works at Eburne: 1 A. O. H. fur.; 9" merchant bar mill.

Bolt and nut factory. (Formerly owned by Eburne Steel Co., Ltd.; acquired by Vancouver Rolling Mills Co., Ltd., in 1919.)

Product: merchant bars, bands, angles and channels, bolts, nuts and washers, annual cap., 10,000 tons.

VERONA STEEL CASTINGS CO., 1120 Frick Bldg., Pittsburgh, Pa.

Inc. Nov. 13, 1911 in Pennsylvania. Capital stock: \$750,000, all owned by Standard Steel Car Co.

J. M. Hansen, P.; W. B. Bierman, Sc.; C. D. Carey, G. M.; A. N. Fay, P. A.; at Pittsburgh. T. H. Gillespie, T. & A.; at Butler, Pa. C. A. Williams, G. S.; at Verona, Pa.

Works at Verona, Pa.: blt. 1904-06, first steel made April 4, 1905; 3 B. O. H. fur. (25-ton); 1 A. O. H. fur. (25-ton).

Product: steel ingots and steel castings for own use and for sale; alloy steel ingots and castings; machinery castings and railroad car castings. Annual cap.: 18,000 tons basic open hearth ingots; 48,000 tons open hearth steel castings (36,000 tons basic, 12,000 tons acid).

VIRGINIA IRON, COAL & COKE CO., Payne Bldg., Roanoke, Va.

Inc. Jan. 14, 1899 in Virginia. Capital stock: com. auth. \$10,000,-000, outstanding \$9,073,600; bonds, \$3,985,000.

John B. Newton, P.; D. D. Hull, Jr., V. P.; C. E. Bertie, A. P.; J. W. Cure, Sc. & T.; W. B. Bowles, A.; J. F. Hunter, G. S. A.; M. A. Shuff, P. A.; at Roanoke. James McNeil, A. Sc.; at 40 Wall St., New York.

Sales office: Payne Bldg., Roanoke, Va.

Brands: "Radford," "Dora," "Watts," "Max Meadows," "Crozer."

Bristol Furnace, Bristol, Va., sold and dismantled in 1917.

Crozer Furnace, Roanoke, Va.: 1 stack, No. 2, 69' 2" x 16' 3", blt. 1889, relined 1919; 4 two-pass stoves (three 60' x 20', one 80' x 20'); 2 steam blowing eng. (30,000 cfm.); 13 water-tube boilers, 3,250 H. P. Beehive coke from own ovens: local limonite, Lake ore and pyrites sinter. Product: foundry pig iron, annual cap., 60,000 tons.

Dora Furnace, Pulaski, Va.: 1 stack, 75' 6" x 18', blt. 1891-92, relined 1917; four 2-pass stoves, 60' x 20'; 3 steam blowing eng. (30,000 cfm.); 6 water-tube, 14 flue boilers, 2,600 H. P. Beehive coke: local limonite, Lake ore and pyrites sinter. Gray iron

foundry, annual cap., 2,000 tons. Product: foundry pig iron, annual cap., 58,500 tons.

Foster Falls Furnace, Foster Falls, Va.: abandoned in 1919.

Graham Furnace, Graham, Va.: sold to Pocahontas Pig Iron Corporation, Aug. 13, 1917.

Max Meadows Furnace, Max Meadows, Va.: 1 stack, 75' x 20', blt. 1890-91, rebt. 1918; four 2-pass stoves (three 60' x 20', one 70' x 20'); 3 steam blowing eng. (30,000 cfm.); 2 water-tube, 16 flue boilers, 2,100 H. P. Beehive coke: local limonite, Lake ore, pyrites sinter and nodules. Product: foundry pig iron, annual cap., 55,000 tons.

Radford Furnace, Radford, Va.: 1 stack, 75' 8" x 18', blt. 1890-92, rebt. 1906-07, relined 1916; four 2-pass Kennedy stoves (80' x 20'); 3 steam blowing eng. (30,000 cfm.); 2 water-tube, 24 flue boilers, 3,000 H. P.; Dwight & Lloyd sintering plant for sintering pyrites cinder, annual cap., 50,000 tons. Beehive coke: local limonite, Lake ore and pyrites sinter. Product: foundry pig iron, annual cap., 75,000 tons.

Watts Furnaces, Middlesboro, Ky.: 2 stacks, blt. 1889-91, relined 1918; No. 1, 74' 3" x 17', No. 2, 74' 3" x 17'; seven 2-pass stoves, 60' x 20'; 6 steam blowing eng. (60,000 cfm.); 6 water-tube, 24 flue boilers, 4,200 H. P.; rotary kiln nodulizing plant. Beehive coke: local limonite and nodules and Lake ore. Product: foundry pig iron, annual cap., 88,000 tons.

Iron ore properties (total annual cap., 200,000 tons):

Allisonia, Va.; Barrett and Wysor mines.

Blue Ridge, Va.; Dewey, Grubb, and Thaxton mines.

Cripple Creek, Va.; Little Wythe mine.

Max Meadows, Va.; Locust Hill mine.

Roanoke, Va.; Rorer and Trout mines.

Limestone quarry: Sexton Quarry at Buchanan, Va., annual cap., 180,000 tons.

Coal mines (total annual cap., 2,000,000 tons):

Tom's Creek Mine, Tom's Creek, Va.; Inman, Linden, and Laura Mines, Inman, Va.; Imperial Mine, Leona Mines, Va.; Marion Mine, Vicco, Va.; Virginia City Mine, Virginia City, Va.

Coke ovens: 800 beehive ovens at Toms Creek, Va., annual cap., 350,000 tons; and 174 beehive ovens at Looney Creek, Va., annual cap., 80,000 tons, total annual cap., 430,000 tons.

VULCAN CRUCIBLE STEEL CO., Aliquippa, Pa.

Inc. Aug., 1901 in New Jersey; reinc. May 1, 1914 in Pennsylvania.

S. G. Stafford, P. & G. M.; W. A. Campbell, Sc. & T.; R. M. Kelso, A. T. & S.; at Aliquippa. J. A. Kelly, V. P.; at Pittsburgh.

Sales offices: Boston, Chicago, Detroit, New York, Philadelphia and St. Louis. Warehouses in Boston and Chicago.

Works at Aliquippa: blt. 1901-02, first steel Mar., 1902; one A. O.

H. fur. ; one 3-ton Heroult electric fur. ; 30-pot crucible steel fur. ; 12" 3-h. 3-st. and 10" 3-h. 6-st. bar mills, first rolled products, April, 1903 ; 5 hammers (500-lb. to 8,000-lb.) ; 500-ton hydraulic press ; 3 annealing fur.

Product : carbon, alloy and high speed tool steel ; annual cap., 9,550 tons ingots (4,500 tons open hearth, 3,600 tons electric, 1,450 tons crucible).

Vulcan Iron & Steel Co., acquired Paden City Works of Carter Iron Co., August 22, 1917. Name changed to Monongahela Iron & Steel Co. in 1919.

VULCAN IRON WORKS, South Main St., Wilkes-Barre, Pa.

Inc. April 17 1867, in Pennsylvania. Capital stock : com. auth. \$3,000,000, issued \$1,800,000.

S. T. Nicholson, P. & G. M. ; I. A. Stearns, V. P. ; F. O. Smith, Sc. & P. A. ; George Nicholson, T. ; C. A. Jackson, G. S. ; G. H. Brown, G. S. M.

Sales offices : Chicago, L. P. Joel, 913 McCormick Bldg. ; New York, M. E. Davis, 50 Church Street.

Company operates plants for manufacture of engines, electric hoists, boilers, fans, mining machinery, locomotives and cement machinery as follows :

South Wilkes-Barre Plant, Wilkes-Barre, Pa.

Hazle Avenue Plant, Wilkes-Barre, Pa.

West Pittston Plant, West Pittston, Pa.

Steel Foundry, Hanover, Pa.

Steel Foundry, Hanover, near Wilkes-Barre, Pa. : one 20-ton A. O. H. fur., f. o. Sept. 1, 1919.

Product : steel castings and steel ingots for own use and for sale ; alloy steel ingots and castings ; annual cap., 12,000 tons.

Wabi Iron Works, New Liskeard, Ontario, Canada, see 1916 Directory, p. 341, electric furnace dismantled in 1919. Manufacture of steel castings discontinued.

Walker, Hervey S., see 1916 Directory, p. 341, sold Vulcan Works, formerly owned by Vulcan Charcoal Iron and Steel Co., North Eddystone Station, Crum Lynne, Pa., to the Eddystone Steel Co., Crum Lynne, Pa., in June, 1917.

WALKER (HIRAM) & SONS METAL PRODUCTS, Ltd., Walkersville, Ont., Canada.

Plant with one Heroult electric fur. for manufacture of nickel-chrome and nickel-copper alloys. Surplus electric furnace capacity used for steel castings.

WALWORTH MANUFACTURING CO., P. O. Drawer 26, Boston, Mass.

Est. 1842; inc. 1847 in Mass. Capital stock: com. \$4,000,000; pref. 6% cum. \$1,000,000; bonds \$1,800,000.

Howard Coonley, P.; Theodore W. Little, V. P.; W. P. F. Ayer, V. P. & G. S. M.; J. C. Bannister, V. P.; George H. Graves, T.; G. A. Ricker, A. T.; C. I. Drake, C.; Wm. A. Jackson, P. A.

Sales offices: Branch stores at Boston, Chicago, New York, Philadelphia and Seattle. Sales offices at San Francisco, Washington, Buenos Aires, Havana, Johannesburg, London, Paris, Santiago, Sao Paulo, and Sydney. Export sales agent: Walworth International Co., New York City.

Product: valves, fittings and specialties.

Plants at First & O Sts., South Boston and at Kewanee, Ill. Steel castings made at Kewanee Works.

Kewanee Works, Kewanee, Ill.: one 1-ton Tropenas converter, blt. 1918, f. o. May 1, 1918; 5 cupolas; foundry for gray iron (annual cap., 30,000 tons), malleable iron (45,000 tons) and brass (3,000 tons) castings.

Product: steel castings for valves and fittings for own use and for sale, annual cap., 800 tons.

Boston Works, First and O Sts., South Boston, annual cap., 12,000 tons gray iron, 3,000 tons malleable iron, 2,500 tons brass castings.

WARMACK, MRS. WILLIAM, Lamkin, Miss.

Ole Miss Furnace, Winborn, Miss.: 1 stack, 32' x 5', blt. 1913, f. o. Oct. 5, 1913; steam blowing eng.; 2 boilers, 60 H. P. Charcoal: carbonate ore. (Formerly owned by Memphis Mining & Manufacturing Co.).

Product: cold blast charcoal pig iron, annual cap., 3,500 tons.

WARMAN STEEL CASTING CO., P. O. Box 608, Station C., Los Angeles, Cal.

Inc. Jan. 25, 1911 in California. Capital stock: com. auth. \$50,000, issued \$43,844.

A. W. Ellington, P., T. & P. A.; G. B. Warman, V. P. & G. S.; Charles J. Wild, Sc., G. M. & G. S. M.

Former works at Redondo Beach dismantled in April, 1917.

Works at Boyle Ave., near Slauson Ave., Los Angeles: blt. 1917, f. o. May 20, 1917; two 3-ton Heroult electric fur.

Product: small electric steel castings for sale; annual cap., 4,000 tons.

WARNER IRON CO., Nashville, Tenn.

Org. May 13, 1899; not inc.

Joseph Warner, Owner; J. H. Bandy, Sc. T. & P. A.

Selling agents: Hickman, Williams & Co.; Rogers, Brown & Co.

Brands: "Warner," "Cumberland," "Dickson."

Cumberland Furnace, Cumberland Furnace, P. O., Dickson Co., Tenn.: 1 stack, 60' x 13', blt. 1892-93; 4 stoves (two 55' x 16', two 60' x 18'); 3 steam blowing eng.; 3 water-tube, 3 flue boilers.

Wise Co. coke: local brown hematite ore. Company owns iron mine at Cumberland Furnace, annual cap., 15,000 tons; also limestone quarry, annual cap., 30,000 tons.

Product: high-silicon pig iron and ferro-silicon, annual cap., 30,000 tons.

WARREN IRON & STEEL CO. (The), Warren, Ohio.

Inc. April, 1909 in Ohio. Capital stock: com. \$150,000; pref. 7% cum. \$50,000.

C. B. Loveless, P.; Dan A. Geiger, V. P.; L. L. Jones, Sc. & T.; A. D. Loop, A.

Works at Warren: two 2-d. heat. fur.; one 2-d. reheat fur.; 24" sheared plate mill. Fuel, coal and nat. gas.

Product: carbon and alloy steel plates and sheets, 15 gage and heavier, up to 42" wide and 300" long, for saws, shovels, agricultural implements, etc.; concave discs and coultter blades; annual cap., 12,000 tons.

WARREN STEEL CASTING CO., 3400 Maury Ave., St. Louis, Mo.

Inc. Sept., 1911 in Missouri. Capital stock: com. \$150,000; bonds \$9,800.

C. E. Hayden, P. & G. M.; M. M. Broad, Sc. & P. A.; W. A. Kammerer, T.; E. B. Fauber, A.; W. L. Kammerer, G. S.; at 3400 Maury Ave., St. Louis. J. P. Pero, V. P. & G. S. M.; at Boatmen's Bank Bldg., St. Louis.

Sales offices: St. Louis, Boatmen's Bank Bldg.; Chicago, Railway Exchange Bldg.; Detroit, Book Bldg.

Former works at Dorcas & Lyon Sts., St. Louis, with crucible steel fur., was abandoned October 1, 1916.

Works at 3400 Maury Ave., St. Louis: blt. 1916; one 5-ton A. O. H.

fur., f. o. June 25, 1918; 2 Heroult electric fur. (one 4-ton, one 1½-ton); first electric steel made Oct. 14, 1916.

Product: steel castings and steel ingots for sale for general purposes; alloy steel castings and ingots; annual cap., 3,500 tons open hearth and 3,000 tons electric steel castings.

WASHBURN WIRE CO., Phillipsdale, Rhode Island.

Inc. July 2, 1917 in Delaware. Capital stock: com. auth. \$7,500,000, issued \$1,250,000; pref. 7% cum. auth. \$3,500,000, issued \$2,839,400.

Eugene R. Phillips, P.; F. C. Weidenmiller, V. P.; W. C. Ingerson, Sc. & P. A.; Frank N. Phillips, T.; J. E. Hayward, C.

Works at Phillipsdale: blt. 1901, f. o. May, 1901; three 15-ton B. O. H. fur.; 3 cont. heat. fur.; 24" 3-h. 1-st. billet; Garrett rod mill with 16" 2-h. 1-st., 10" 2-h. 5-st. and 9" 2-h. 6-st.; 2 box annealing fur.; 2 pickling mach.; 84 wire drawing blocks for wire .042" to .500"; 24" 3-h. hot rolls for flats long idle.

Product: steel ingots; nickel, chrome and vanadium alloy steel ingots; wire rods and wire; annual cap., 38,300 tons ingots, 31,600 tons billets, 22,800 tons wire rods, 6,000 net tons plain wire.

WASHINGTON IRON WORKS, Seattle, Washington.

Inc. Jan. 6, 1908 in Washington. Capital stock: com. \$500,000. Gerald Frink, P.; Francis G. Frink, V. P. & Sc.; Carman F. Bridge, T.

Sales offices: Portland, Ore., Zimmerman-Wells-Brown Co.; San Francisco, W. H. Worden Co.; Vancouver, B. C., Vancouver Machinery Depot, Ltd.

Works, Boulevard & Norman Sts., Seattle: blt. 1882; two electric furnaces (one 3-ton Girod, one 1-ton own make); one cupola; gray iron foundry (2,200 tons).

Product: steel castings for sale and for own use; manganese, chrome and vanadium alloy steel castings, annual cap., 3,000 tons.

Company makes logging and hoisting engines, boilers, tanks and marine machinery.

Washington Steel & Iron Co., Spokane, see 1916 Directory, p. 343; steel plant at Leavenworth abandoned in 1916 and dismantled.

WASHINGTON STEEL & ORDNANCE CO., P. O. Box 1812, Washington, D. C.

Inc. June 1, 1911 in West Virginia. Capital stock: com. auth. \$1,200,000, issued \$1,126,000; pref. 7% cum. auth. \$600,000, issued \$552,000.

Lewis J. Firth, Ch.; J. W. Kinnear, V. P.; at Oliver Bldg., Pittsburgh, Pa. Corcoran Thom, P.; H. F. Clark, Sc. & T.; W. A. Anderson, A. Sc. & A. T.; H. S. Garrett, G. S.; H. H. Wentz, P. A.; at Washington, D. C.

Works at Washington, D. C.: 3 B. O. H. fur. (two 15-ton, one 35-

ton); one 1-ton Stassano electric fur.; 1 cupola; 3 forging hammers (3-ton, 12-ton, 20-ton); 16 drop hammers (200-lb. to 10,000-lb.); 12 trimming presses. Fuel, coal and oil.

Product: projectiles, automobile forgings, alloy steel forgings of all kinds; rolled rings; annual cap., 40,000 tons steel ingots.

WASHINGTON TINPLATE CO., Washington, Pa.

Inc. Aug. 7, 1907 in Pennsylvania. Capital stock: com. \$600,000.

G. W. Hannan, P.; John F. Kraft, V. P., Sc. & T.; T. P. McDonough, G. M.

Works at Washington: rebld. 1911-12, f. o. April 1, 1912; 6 hot black plate mills (27" x 34"); 6 pair and 6 sheet fur.; 6 cold mills (3 stands of 2 sets tandem) 22" x 36" roughing sets and 24" x 36" finishing sets; 4 box annealing fur.; 1 pickling mach. (3-arm); 11 tinning sets for coke tinplates. Fuel, coal.

Product: black plates for tinning, annual cap., 24,000 tons; tinplates, 600,000 base boxes.

WAYNE STEEL CO., East Lake Road, Erie, Pa.

Inc. Sept., 1918 in Delaware. Capital stock: com. 20,000 shares, no par value; pref. 7% cum. auth. \$2,000,000, issued \$1,000,000.

L. A. McElroy, P.; B. S. Fletcher, V. P.; H. H. Hanchett, Sc.; J. S. Curtis, T.

Company owns a controlling interest in the United States Horse Shoe Co. Building an open hearth steel plant (two 30-ton B. O. H. fur. construction begun in Dec., 1918; annual cap., 40,000 gross tons ingots) and special billet making machinery on a site adjoining United States Horse Shoe Co. plant, East Lake Road, Erie. Will furnish billets to United States Horse Shoe Co. and its subsidiary the Canadian Horse Shoe Co. and market surplus.

WAYNE STEEL & IRON CO., 405 Park Bldg., Pittsburgh, Pa.

Inc. April 11, 1919. Capital stock: com. auth. \$5,000,000.

J. Wayne McVeagh, P.; at 512 Fifth Ave., New York.

William M. Lycett, V. P. & G. S. M.; at 2124 Pine St., Philadelphia. Charles H. Sisson, V. P.; George H. Sisson, T. & G. M.; J. S. Ackerman, A. Sc.; at Pittsburgh. Benjamin J. Forrest, G. S.; at Croghan, N. Y.

Building works near Croghan, Lewis Co., New York: 3 Greaves-Etchells electric fur. (one 3-ton, one 5-ton, one 15-ton) to make steel ingots and castings direct from ore in electric furnaces.

Weatherly Foundry & Machine Co., Weatherly, Pa., see 1916 Directory, p. 344, Tropenas converter sold in 1918 to Weatherly Steel Castings Co., Weatherly, Pa.

WEATHERLY STEEL CASTINGS CO., Weatherly, Pa.

Inc. Sept., 1918 in Delaware. Capital stock: pref. 7% cum. \$50,000.

A. G. Isaacs, P.; D. E. Rosser, Sc.; at Wilkes-Barre, Pa. C. H. Bliem, V. P., T. & G. M.; J. M. Dreher, P. A.; at Weatherly. Sales agent: J. M. Umber, 51 East 42nd St., New York. Works at Weatherly (leased from Weatherly Iron & Steel Co.); one 2-ton Tropenas converter; 1 cupola. Product: steel castings for sale, annual cap., 3,000 tons.

WEHR STEEL CO., West Allis, Milwaukee, Wis.

Inc. 1910 in Wisconsin.

William E. Wehr, P.; E. R. Wehr, V. P., G. M. & P. A.; H. W. Wehr, V. P. & G. S. M.; C. F. Wehr, Sc., T. & G. S.

Works at West Allis: blt. 1910, first crucible steel made Sept. 10, 1910, crucible fur. dismantled in 1914; one Whiting converter (2-ton) blt. 1913, f. o. June 1, 1913; one 3-ton Moore electric furnace, blt. 1918, f. o. June 10, 1918.

Product: steel castings for sale, annual cap., 5,400 tons (3,600 electric, 1,800 tons converter).

WEIRTON STEEL CO., Weirton, West Virginia.

Inc. April 27, 1905 in West Virginia. Capital stock: auth. \$20,000,000.

Formerly known as Phillips Sheet & Tin Plate Co.; name changed to Weirton Steel Co., July 1, 1918.

E. T. Weir, P.; D. M. Weir, 1 V. P. & T.; J. C. Williams, 3 V. P.; J. J. Watson, Sc. & G. S. M.; R. J. Hanna, A. T.; F. A. Hanlin, A. Sc.; F. B. Lyons, A.; J. F. Newman, P. A.; at Weirton. W. H. Baldridge, 2 V. P.; at 30 Church St., New York, N. Y.

Sales offices:

Baltimore, E. B. Mallory & Co., Lexington & North Sts.

Boston, W. J. Ham Co., 58 Fiske Bldg.

Chicago, H. M. Easton & H. L. Gray, 208 South La Salle St.

Detroit, August J. Bopp, 2032 Dime Bank Bldg.

Los Angeles, Balfour, Guthrie & Co.

Montreal, A. C. Leslie & Co., 560 St. Paul St.

New York, W. P. Siebert, Jr., 30 Church St.

Portland, Ore., Balfour, Guthrie & Co.

St. Louis, E. R. Hensel Steel & Copper Co., Security Bldg.

San Francisco, Balfour, Guthrie & Co.

Seattle, Balfour, Guthrie & Co.

Tacoma, Balfour, Guthrie & Co.

Vancouver, Balfour, Guthrie & Co.

Product: basic pig iron; open hearth steel ingots, blooms, billets, slabs, sheet and tinplate bars; black plates for tinning; tinplates and terne plates; hot and cold rolled strip steel.

Weirton Plant, Weirton, W. Va.:

Blast Furnace: 1 stack, 92' x 22' 6", const. begun July 21, 1918; blown in July 20, 1919; 3 two-pass side-comb. stoves, 100' x 22'; two steam blowing eng.; 8 water-tube boilers, 4,824 H. P.; one

double-strand pig casting mach.; 1 slag granulating pit, annual cap., 90,000 tons. Coke: Lake ore. Product: basic pig iron, annual cap., 200,000 tons.

Steel Works: const. begun June, 1919; to be in operation in Sept, 1920; 7 B. O. H. fur. (100-ton); one 1,300-ton mixer; six 4-hole soaking pits; 40" 2-h. 1-st. reversing blooming; 21" 2-h. 4-st. cont. roughing with 18" vertical edging stand; 18" 2-h. 6-st. and 15" 2-h. 2-st. vertical edging comb. sheet bar and billet mill. Product and annual cap.: 400,000 tons ingots, 230,000 tons sheet and tinplate bars, 100,000 tons blooms and billets, 60,000 tons slabs. Tinplate Dept.: blt. 1909, f. o. Jan., 1910; 26 pair and 26 sheet fur.; 26 hot black plate (tin) mills; 13 cold mills; 4 Mesta pickling mach.; 10 box annealing fur.; 52 sets for tin and terne plates. Product: black plates for tinning, annual cap., 115,000 tons; tinplates, 2,300,000 base boxes.

Strip Steel Dept.: semi-cont. hoop and band mill with 20" 2-h. 6-st. and 16" 2-h. 5-st.; cold rolling trains; 8 box annealing fur.; 3 pickling machines. Product: hot rolled strip, hoops and bands, annual cap., 120,000 tons; cold rolled strip, annual cap., 65,000 tons.

Clarksburg Plant, Clarksburg, W. Va.: blt. 1901-02, f. o. June, 1902; 12 pair and 12 sheet fur.; 12 hot black plate (tin) mills; 12 cold mills, 6 stands tandem of 2 each; 9 box annealing fur.; 2 pickling mach.; 28 sets for coke tinplates. Product: black plates for tinning, annual cap., 55,000 tons; coke tinplates, 1,100,000 base boxes.

Steubenville Plant, Steubenville, Ohio: blt. 1901-02, f. o. July, 1902; 12 pair and 12 sheet fur.; 12 hot black plate (tin) mills, 12 cold mills (6 stands of 2 tandem); 2 Mesta pickling mach.; 6 box annealing fur.; 20 sets for coke tinplates. Product: black plates for tinning, annual cap., 55,000 tons; coke tinplates, annual cap., 1,100,000 base boxes.

WELLMAN-SEEVER-MORGAN CO. (The), 7,000 Central Ave., Cleveland, Ohio.

Inc. April 4, 1903 in Ohio. Capital stock: com. auth. \$6,000,000, issued \$2,540,000; pref. 7% cum. auth. \$3,000,000, issued \$2,500,000.

Edwin S. Church, P. & G. M.; S. H. Pitkin, V. P.; George W. Burrell, 2 V. P.; W. H. Cowell, Sec. & T.; N. R. Fairlamb, A.; H. P. Glidden, S. M.; S. T. Plimpton, P. A.

Sales offices:

Atlanta, Quin Stuart, 318 Hurt Bldg.

Denver, Fred Bostwick, 612 Ideal Bldg.

Mexico, W. C. Benbow, 1220 Apartado.

Montreal, Canadian Fairbanks Morse Co., 84 St. Antoine St.

New York, Fred Stadelman, 50 Church St.

Philadelphia, Edson S. Harris, Widener Bldg.

San Francisco, N. S. Ross, 415 Rialto Bldg.

Works at Akron, Ohio, for manufacture of machinery.

Works at 7000 Central Ave., Cleveland: blt. 1902-03, f. o. Jan. 29, 1903; one 20-ton A. O. H. fur., annual cap., 10,000 tons.

Product: steel castings for sale and for own use in manufacture of heavy machinery, coal and ore handling equipment; steel works equipment, charging machines, special cranes, Hughes gas producers, heavy hydraulic turbine equipment, large electric hoists and other mine equipment, rubber manufacturing machinery.

WELLSTON IRON FURNACE CO. (The), Jackson, Ohio.

Inc. June 16, 1916 in Ohio. Capital stock: com. auth. \$1,000,000, issued \$300,000; pref. 6% and 7% cum. auth. \$400,000, issued \$139,000.

M. L. Stephenson, P. & G. S. M.; S. E. Stephenson, V. P. & G. M.; S. A. Sternberger, T. & P. A.; J. G. Harding, G. S.; at Jackson. Joseph McGhee, Sec.; at Columbus, Ohio.

Wellston Furnaces, Wellston: 2 stacks; No. 1, 63' x 12', blt. 1874-75, last rebt., 1908; No. 2, 70' x 15' 6", blt. 1874-75, last rebt., 1908; 5 two-pass side-combustion stoves (two 80' x 20', three 75' x 18'); five steam blowing eng. (1,485 cfm.); 6 water-tube boilers, 1,800 H. P. West Va. and Ky. beehive coke: Lake ore. (Formerly owned by Wellston Steel & Iron Co.; acquired by Wellston Iron Furnace Co., June 1, 1916).

Product: bessemer, low-phosphorus and malleable pig iron, annual cap., 127,000 tons.

Portland Cement Plant at Superior, Ohio.

Wellston Steel and Iron Co., Wellston, Ohio, see 1916 Directory, p. 345. Wellston Furnaces were sold to Wellston Iron Furnace Co., June 1, 1916. Milton Furnace was sold to Milton Iron Co., Wellston, Ohio, June 5, 1916.

West Coast Iron Co., San Francisco, Cal., see 1916 Directory, p. 345. Steel plant at 16th & Rhode Island Sts., San Francisco, built 1913; leased to Judson Manufacturing Co.; on expiration of lease it was operated by West Coast Iron Co.; sold to Pacific Coast Steel Co., Dec., 1918.

WEST LEECHBURG STEEL CO., Farmers Bank Bldg., Pittsburgh, Pa.

Inc. May 19, 1897 in Pennsylvania. Capital stock: com. auth. \$75,000, issued \$69,500.

J. W. Kirkpatrick, Ch.; James Lippincott, P. & G. M.; J. L. Kirkpatrick, V. P.; D. M. Campbell, Sec. & T.; G. W. Sheridan, A.; A. S. Geiger, P. A.; J. E. Garrity, M. S.; C. S. Todd, S.

Sales offices:

Chicago, Peoples Gas Bldg.

Cincinnati, The Dean Higgins Co., Union Central Bldg.

Cleveland, H. D. Cushman & Co., Swetland Bldg.

Detroit, Dime Bank Bldg.

New York, 50 Church St.

Toledo, The Dean Higgins Co., Ohio Bldg.

Works at West Leechburg, Pa.: blt. 1898; 2 B. O. H. fur. (one 40-ton, one 30-ton) first steel made July, 1907; 1 ingot heat. fur.; one 10-ton steam cogging ham.; 12" 3-h. 9-st. and 9" 3-h. 5-st. hot strip mills; 23 stands cold mills; pickling and annealing depts.

Product and annual cap.: ingots for own use, 40,000 tons; hoops and bands, hot and cold rolled strip steel for blanking, stamping and drawing, 60,000 net tons.

WEST MICHIGAN STEEL FOUNDRY CO., Muskegon, Mich.

Inc. Oct. 12, 1912 in Michigan. Capital stock: com. \$400,000; pref. \$200,000.

John Q. Ross, P.; William E. Jeannot, V. P., T. & P. A.; John W. McKeon, V. P. & G. M.; John B. Jardine, Sc. & A.; Ernest C. Shaw, S.

Works at Muskegon, Mich.: blt. 1911, f. o. Dec. 4, 1911; two 4,800-lb. Tropenas converters; one 6,000-lb. Booth-Hall electric fur.; one 7,000-lb. Pittsburgh electric fur.; 1 cupola.

Product: steel castings, vanadium alloy steel castings, for sale; "Hy-Tempo" heat resisting, non-oxidizing metal for carbonizing boxes, cyanide pots, etc.; annual cap., 4,000 tons converter, 8,000 tons electric steel castings.

WEST PENN STEEL CO., Brackenridge, Pa.

Inc. 1916 in Pennsylvania. Capital stock: com. auth. \$5,350,000, issued \$350,000; pref. 7% cum. auth. and issued \$525,000.

Joel W. Burdick, Ch.; Julian Burdick, P. & G. M.; John McGinley, V. P.; J. E. Ober, T.; M. C. Bair, A.; C. K. Nichols, G. S.; George R. Fink, G. S. M.; R. B. McKee, Jr., P. A.; at Brackenridge. W. W. Ford, Sc.; at Frick Bldg. Annex, Pittsburgh, Pa.

Sales offices: Chicago, F. L. Kennedy, Peoples Gas Bldg.; Detroit, W. J. Laffrey, Dime Bank Bldg.; New York, W. E. Loughman, 501 Fifth Ave.

Works at Brackenridge: blt. 1909, f. o. Oct. 1, 1909; four 80-ton B. O. H. fur.; three 4-hole soaking pits; 30" 3-h. 1-st. sheet bar mill; 10 sheet and 10 pair fur.; 10 hot black sheet mills (26" and 28" x 34" to 64"); 12 single stand 24" cold mills; 17 box annealing fur.; 3 pickling mach. Fuel, coal and nat. gas. Steel foundry and machine shop for own use.

Product and annual cap.: steel ingots, 150,000 tons; sheet and tin-plate bars, 100,000 tons; black sheets, 50,000 tons; automobile and electric sheets.

WEST STEEL CASTING CO. (The), 805-845 East 70th St., Cleveland, Ohio.

Inc. Aug. 29, 1906 in Ohio. Capital stock: com. \$100,000.

R. H. West, P. & T.; D. P. Lansdowne, V. P. & Sc.

Works at 805 East 70th St., Cleveland: three 4,200-lb. converters (2 Tropenas, 1 Fisher); 2 cupolas; one 4,500-lb. Snyder electric fur. installed 1919. Crucible furnaces dismantled in 1917.

Product: steel castings, automobile castings, cast steel motor truck wheels; annual cap., 4,800 tons (2,400 tons converter, 2,400 tons electric).

WEST VIRGINIA RAIL CO. (The), Huntington, West Va.

Inc. May, 1907 in West Virginia. Capital stock: com. \$900,000; pref. 7% cum. auth. \$100,000, issued \$35,500.

Joseph Schonthal, P.; S. N. Summer, 2 V. P.; at Columbus, Ohio. H. A. Zeller, 1 V. P. & G. M.; D. C. Schonthal, Sc., T. & G. S. M.; C. C. Watters, A. Sc.; H. H. Diehl, G. S.; at Huntington.

Works at Huntington: 2 cont. heat. fur.; 20" 3-h. 2-st. with one set pinions; comb. 16" and 12" with 16" 3-h. 1-st., 1-st. 16" pinions, 12" 3-h. 6-st., 1-st. 12" pinions, rail rerolling mills; 20" mill f. o. 1904, 12" mill f. o. Nov., 1918. Fuel, coal and gas.

Product: light rails, 8-lb. to 45-lb. sections; hard steel bars, concrete reinforcing bars, agricultural implement shapes, angle and splice bars, bedstead angles; annual cap., 100,000 tons.

WESTERMAN & CO. (partnership), Lockport, N. Y.

C. G. Sutliff, General Manager.

Works at Lockport: blt. 1870; 3 heat. fur. (two 2-d., one 3-d.); 16" 3-h. 3-st. bar; 9" 3-h. 3-st. guide.

Product: high grade screw iron, rounds, squares, hexagons, etc., annual cap., 9,000 tons.

WESTERN CRUCIBLE STEEL CASTING CO., Minneapolis, Minn.

Inc. Nov. 15, 1906 in Minnesota. Capital stock: com. auth. \$400,000, issued \$50,000; pref. 7% non-cum. auth. \$100,000, issued \$82,000; bonds \$45,000.

G. T. Honstain, P.; E. W. Kneeland, V. P. & T.; W. J. Milne, Sc.; C. T. Danielson, A.; E. F. Junger, P. A.

Works at 2833 Grand Ave., Minneapolis: blt. 1906; 2 Snyder electric fur. (1½-ton and 3-ton); six 6-pot crucible fur. f. o. Dec. 26, 1906, dismantled Feb. 1, 1917.

Product: steel castings for sale; annual cap., 4,800 tons.

WESTERN REDUCTION CO., 24th & Nicolai Sts., Portland, Ore.

Inc. April 23, 1917 in Oregon. Capital stock: com. auth. \$100,000, issued \$75,000.

John H. Haak, P.; Jacob A. Haak, V. P.; C. E. Haak, Sc. & T.

Works at 24th & Nicolai Sts., Portland: two electric furnaces for the manufacture of pig iron from scrap iron and steel, borings, turnings, etc. Also make ferro-manganese and ferro-chrome.

Product and annual cap.: 5,000 tons pig iron or 2,000 tons ferro-alloys.

Western Reserve Steel Co. (The), Warren, Ohio, see 1916 Directory, p. 348, was sold to The Brier Hill Steel Co., Nov. 15, 1916.

WESTERN ROLLING MILL CORPORATION, 401-403 Pacific Block, Seattle, Wash.

Inc. Jan. 3, 1919 in Washington. Capital stock: com. auth. \$1,750,000, issued \$28,520; pref. 7% cum. auth. \$250,000, issued \$350.

J. Johnson, P. & G. M.; J. M. Price, V. P.; Frederick Bruhn, Sc. & T.

Plan to build plant at Seattle to be completed about Dec. 1, 1920; three 50-ton B. O. H. fur., one 10-ton electric fur. own design; 3 cont. heat. fur., 22" 3-h. 2-st. structural, 22" 3-h. 1-st. breakdown and 12" 3-h. 6-st. Belgian.

WESTERN STEEL CAR & FOUNDRY CO., Farmers Bank Bldg., Pittsburgh, Pa.

Inc. May 6, 1902 in New Jersey. Capital stock: com. \$1,250,000; bonds \$1,073,000.

F. N. Hoffstot, P.; N. S. Reeder, V. P.; J. F. MacEnulty, V. P.; C. E. Church, Sc. & A. T.; C. E. Postlethwaite, G. S. M.; at 24 Broad St., New York. J. B. Rider, V. P. & G. M.; W. A. Chamberlin, A.; C. A. Lindstrom, A. P.; H. E. Swartz, T.; F. D. Evans, A. Sc. & A. T.; P. M. Collier, A. G. M.; J. H. Hackenburg, P. A.; at Farmers Bank Bldg., Pittsburgh. J. H. Regan, A. Sc. & A. T.; at Peoples Gas Bldg., Chicago. C. C. Cochran, G. S.; at Hegewisch, Ill.

Sales offices: C. E. Postlethwaite, G. S. M., 24 Broad St., New York; H. H. Gilbert, M. S., Peoples Gas Bldg., Chicago; K. C. Gardner, M. S., Farmers Bank Bldg., Pittsburgh; Davis & Lloyd (agents) London, England.

Works at Hegewisch, Ill.: two 1½-ton Snyder electric fur. added 1918; one 3-ton Tropenas converter added 1919; 2 cupolas. Gray iron, malleable iron and brass foundry. Carbuilding plant.

Product: steel castings for own use and for sale, alloy steel castings; annual cap., 2,500 tons electric and 5,000 tons converter steel castings; gray iron (8,000 tons), malleable iron (8,000 tons) and brass castings; truck frames, bolsters, center plates, brake beams, stake pockets, stakes and other parts for freight cars; hot and cold pressed parts; drop forgings, forged machine work and steam hammer forgings; all-steel, wooden and composite freight cars; freight car repairs.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO., East Pittsburgh, Pa.

Trafford Foundry, Trafford, Pa.: one 6-ton Ludlum electric fur.

Product: steel castings for own use only, annual cap., 4,000 tons.

Wharton Steel Co., Philadelphia, see 1916 Directory, p. 349. This

company was formed in 1909 to take over the individual holdings of Joseph Wharton. The coal and coke properties at Coral, Pa., held by Wharton Coal & Coke Co., a subsidiary, were sold in October, 1916. The coke ovens and 1,500 acres coal lands were sold to the Potter Coal & Coke Co., Greensburg, Pa., leaving about 6,000 acres which reverted to the Estate of Joseph Wharton. The remaining properties, consisting of blast furnaces, iron ore properties and the Wharton & Northern Railroad were optioned in October, 1916, by J. L. Replogle and purchased Dec. 28, 1916. The company was succeeded by the Replogle Steel Company, November 6, 1919.

Wheeling Corrugating Co., Wheeling, W. Va., see 1916 Directory, p. 350. Merged in Whitaker-Glessner Co. in 1917, and now known as Wheeling Corrugating Dept. of that company.

WHEELING MOLD & FOUNDRY CO., Wheeling, West Va.

Inc. Sept. 30, 1919 in Delaware. Capital stock: com. 50,000 shares, no par value; pref. 7% cum. \$1,200,000; bonds \$1,600,000.

Herbert E. Field, P. & G. M.; Charles C. Woods, Sc. & T.; E. C. Rauschenberg, G. S.; J. W. Millard, P. A.

Sales agents: Chicago, A. K. Hamilton, 208 South La Salle St.; New York, F. F. Vandevort, 90 West St.

Works at Wheeling: three 30-ton A. O. H. fur.; 2 cupolas; 3 air furnaces. Gray iron and roll foundry. Machine shop.

Product: steel castings for own use and for sale, for rolling mills and special machinery; nickel, chrome and manganese alloy steel castings; annual cap., 30,000 tons; gray iron castings, 10,000 tons; chilled and sand iron rolls, 4,000 tons; steel rolls; ordnance castings for the Army and Navy; ship castings; rolling mill and special machinery.

WHEELING STEEL & IRON CO., Main & South Sts., Wheeling, W. Va.

Inc. April 16, 1892 in West Virginia. Capital stock: com. auth. \$10,000,000, issued \$9,292,600; bonds \$2,200,000.

Isaac M. Scott, P.; John Duncan, V. P. & G. S. M.; C. J. Hunter, Sc. & T.; W. H. Higgins, A. Sc.; H. T. Swift, A. T.; W. H. Kettler, A.; E. D. Adams, P. A.; at Wheeling. J. W. Carpenter, G. S.; at Benwood, W. Va.

Sales offices:

Chicago, A. S. Frampton, McCormick Bldg.

Kansas City, Mo., C. E. Elliott, R. A. Long Bldg.

New York, N. J. Higinbotham, Equitable Bldg.

Philadelphia, L. J. Lowe, Bourse Bldg.

Pittsburgh, T. W. Oberhauser, Oliver Bldg.

Brands: "Belmont," "Top Mill," "Martins Ferry," "W. S. W.," "Wheeling."

Product: pig iron; blooms, billets and slabs, sheet bars; skelp, wrought iron and steel pipe; black plate for tinning, tinplates.

Properties; 3 blast furnace plants, steel works, rolling mills, tube mills, tin mills and tinplate works, coal, coke and limestone properties.

BLAST FURNACES.

Belmont Furnace, Wheeling: 1 stack, 70' x 16', blt. 1874, remodel. 1893, relined 1916; 3 Gordon fire-brick stoves, 65' x 18'; 2 steam blowing eng.; 4 water-tube boilers, 1,200 H. P.; slag granulating pit. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 75,000 tons.

Top Mill Furnace, Wheeling: 1 stack, 80' x 18', blt. 1873-74, relined 1918; 3 Massicks & Crooke stoves, 70' x 19' 6"; 2 steam blowing eng.; 6 water-tube boilers, 1,500 H. P.; 1 Uehling single-strand pig casting mach.; 1 slag granulating pit. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 100,000 tons.

Martins Ferry Furnace, Martins Ferry, Ohio: 1 stack, 80' x 18', blt. 1866, rebt. 1903-05, relined 1919; 4 Massicks & Crooke stoves, 75' x 20'; 3 steam blowing eng.; 6 water-tube boilers, 1,800 H. P.; one Uehling pig casting mach.; 1 slag granulating pit. Conn. coke: Lake ore. Product: bessemer pig iron, annual cap., 100,000 tons.

STEEL WORKS, ROLLING MILLS, ETC.

Wheeling Steel Works, Benwood, W. Va.: blt. 1885-86, f. o. Aug. 12, 1886; 2 Bessemer converters (6-ton); 3 cupolas; two 4-hole soaking pits; 36" 2-h. 1-st. reversing blooming mill. Product and annual cap.: 225,000 tons bessemer ingots; 200,000 tons blooms, billets and slabs.

Benwood Skelp Mill, Benwood: three 2-d. heat. fur.; 24" 3-h. 2-st. grooved skelp mill. Product: skelp, annual cap., 30,000 tons.

Benwood Tube Works, Benwood: 3 butt-weld fur. for pipe $\frac{1}{8}$ " to 3"; 2 lap-weld fur. for pipe 2" to 12"; 2 galvanizing pots. Product and annual cap.: 125,000 tons black pipe, 25,000 tons galvanized pipe.

Belmont Mill, Wheeling, W. Va.: blt. 1849; 8 heat. fur. (three 2-d. regen., three 2-d. direct, 2 cont.); 22" 3-h. 3-st., 22" 3-h. 2-st., and 16" 3-h. 2-st. grooved skelp mills. Product and annual cap.: 120,000 tons skelp.

Tinplate Department, Yorkville, Ohio: 24 sheet and 24 pair fur.; 24 hot black plate (tin) mills (28"); 18 cold mills (26") 6 sets of 3-st. tandem; 8 double annealing fur.; 2 Mesta pickling mach.; 39 tinning sets for coke tinplates. Product and annual cap.: 100,000 tons black plate for tinning, 2,000,000 base boxes tinplates.

Coal and coke properties: Benwood coal mine with 825 acres of coal lands near Benwood, W. Va., annual cap., 135,000 tons; capital stock of Wheeling Coke Co., which owns 991 acres undeveloped coal lands in lower Connellsville District, Fayette Co., Pa. and 1,000 acres coal lands in Allegheny Co., Pa.

Company owns a one-third interest in the Bessemer Limestone Co., of Youngstown, Ohio; also owns part interest in several ore mines in Lake Superior District.

WHEELING STEEL CASTING CO., P. O. Box 37, Wheeling, W. Va.

Inc. 1914 in West Virginia. Capital stock: com. auth. \$250,000, issued \$205,000; bonds \$38,800.

C. H. Dowler, P. & G. M.; George W. Eckhart, V. P.; S. M. Noyes, Sc.; A. W. Dowler, G. S. M.; H. W. Hunter, P. A.

Works at Warwood, Wheeling: blt. 1911; one 20-ton A. O. H. fur.

Product: steel ingots and steel castings for sale; alloy steel ingots and castings; misc. castings from 50-lb. to 30,000 lb.; annual cap., 9,600 tons (6,000 tons ingots, 3,600 tons castings).

WHITAKER-GLESSNER CO., Wheeling, W. Va.

Inc. Dec. 28, 1903 in West Virginia. Capital stock: com. auth. \$35,000,000, issued \$3,871,900; pref. 8% cum. auth. \$25,000,000, issued \$1,311,900; bonds \$2,826,502.

Alexander Glass, Ch.; Andrew Glass, P.; E. C. Ewing, V. P.; A. C. Whitaker, V. P.; W. H. Abbott, V. P.; N. P. Whitaker, V. P.; G. W. Hocking, Sc.; W. H. Manning, T.; A. Q. Moffat and W. L. Latta, G. S. M.; W. B. Greer, P. A.; at Wheeling. A. J. McFarland, G. S.; C. H. Sampson, P. A.; at Portsmouth, Ohio.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

Brands: "Crescent," "Laughlin," "Portsmouth Iron."

Product: pig iron, blooms, billets and slabs, forging billets, sheet bars; black, blue annealed and galvanized sheets, formed roofing, steel barrels and drums, range boilers; tinplates and terne plates.

Properties: Blast furnace, steel works and rolling mill at Portsmouth, Ohio: 3 sheet mill plants at Wheeling, W. Va., Beach Bottom, W. Va. and Martins Ferry, Ohio; one-third interest in Portsmouth-Solvay Coke Co.

Portsmouth Works, Portsmouth, Ohio: 1 stack 92' x 22', blt. 1917, f. o. Aug. 27, 1917; 3 Kennedy stoves, 110' x 24'; 2 steam turbo blowers (100,000 cfm.); 6 water-tube boilers, 2,598 H. P., serve also coke ovens; 1 Uehling double-strand pig casting mach.; slag granulating pit, annual cap., 73,000 tons. By-product coke from Portsmouth Solvay Coke Co.: Lake ore. Product: basic, malleable and foundry pig iron, annual cap., 175,000 tons.

Steel Works: 10 B. O. H. fur. (60-ton); six 4-hole soaking pits; three 3-d. slab heat. fur.; 2 billet heat. fur. (one 1-d., 1 cont.); 35' 2-h. 1-st. reversing blooming; 24' 3-h. 3-st. bar; 18' 3-h. 3-st. bar; installing 18' 2-h. 8-st. cont. billet and bar mill; 19 sheet and pair fur.; 2 sheet reheat. fur.; seven 6-d. pair heat. fur.; 7 cont. pair heat. fur.; 2 jobbing plate mills (30' x 72' 3-h. and 30' x 38' to 60' 2-h.); 2 black plate (tin) mills (30' x 32'); 8 hot black sheet mills (30' x 38" to 30' x 54"); 7 hot black sheet

mills under construction (30" x 38" to 30" x 54"); cold mills, 4 stands in operation, 12 stands under construction, 30" x 44" to 30" x 60"; 16 double box annealing fur.; 10 pickling mach.; 7 hand pickling tanks; 8 galvanizing pots (80,000 tons). Gray iron and brass foundry for own use. Product and annual cap.: 350,000 tons ingots, 1,200 tons steel castings for own use; 310,000 tons blooms, billets and slabs, 180,000 tons sheet bars; 57,000 tons blue annealed plates and sheets; 46,000 tons black sheets and 32,200 tons black sheets under construction.

Martins Ferry Works, Martins Ferry, Ohio: 6 comb. sheet and pair fur.; 6 hot black sheet mills (one 26" x 36", one 28" x 38", four 28" x 36"); two cold mills, 24" x 48"; 6 double, 1 single box annealing fur.; 9 galvanizing pots (100,000 tons). Product and annual cap.: 30,000 tons black sheets for galvanizing, 100,000 tons galvanized sheets.

Whitaker Works, Wheeling, W. Va.: 12 comb. sheet and pair fur.; 4 hot black sheet mills (one 44", one 38", two 36"); 7 double sheet annealing fur.; 8 hot black plate (tin) mills (seven 28" x 36", one 29" x 44"); 2 double box annealing fur.; 2 stands cold rolls on hot mill train (24" x 48", 28" x 48"); 2 trains tandem of seven stands cold mills, four 24" x 38", three 24" x 48"; one Mesta pickling mach.; 8 tinning sets (6 for coke tinplates, 1 common terne, 1 long terne). Product and annual cap.: 20,000 tons black sheets for galvanizing, stamping and corrugating and polished blue sheets; 27,000 tons black plate for tinning; 2,000 tons long terne plates, 250,000 base boxes tinplates, 44,000 base boxes common terne plates.

Beach Bottom Works, Beach Bottom, W. Va.: 8 double sheet and 8 double pair fur.; 8 hot black sheet mills (six 30" x 36", one 30" x 38", one 30" x 54"); 6 cold mills (two 24" x 58", four 26" x 58"); 6 double box annealing fur.; one Mesta pickling mach.; 2 sets for long terne plate. Product and annual cap.: 45,000 tons black sheets for galvanizing, corrugating and stamping and automobile sheets.

Whiteley Steel Co., Muncie, Ind., see 1916 Directory, p. 354; plant destroyed by fire, Nov. 20, 1916.

WICKWIRE BROTHERS, 189 South Main St., Cortland, N. Y.

Est. 1873, inc. 1892, in New York. Capital stock: com. \$300,000.

T. H. Wickwire, Ch.; C. C. Wickwire, P.; A. F. Stilson, V. P. & G. S.; F. R. Wickwire, Sc.; Edward Stilson, T.

Works at Cortland: first wire drawn 1879; rod mills, blt. 1900, f. o. Feb. 1, 1901; steel plant blt., 1902, f. o. Feb., 1903; three 30-ton B. O. H. fur.; 8 Morgan gas prod.; two 2-d. heat. fur.; 25" 2-h. 1-st. blooming; Morgan double continuous wire rod mill; wire drawing blocks for wire No. 5 to No. 36 gage; 100 wire nail mach.; 3 barbed wire mach.

Product: ingots, wire rods and wire; wire nails, barbed wire, wire cloth, netting and other wire products; annual cap., 40,000 tons ingots, 36,000 tons wire rods, 120,000 kegs wire nails.

WICKWIRE STEEL CO., Buffalo, N. Y.

Inc. Mar., 1907 in New York. Capital stock: com. auth. \$6,000,000, issued \$5,000,000; bonds \$2,399,000.

T. H. Wickwire, P.; T. H. Wickwire, Jr., V. P. & T.; W. A. Wickwire, V. P. & Sc.; H. J. Woodmansee, V. P.; W. G. Mowat, A.; L. L. Arnold, G. S.

Sales office: Equitable Bldg., New York, Allan Frazer.

Brands: "Wickwire" and "Cortland."

The company owns works at Buffalo with 2 blast furnaces, steel works and wire mill; an interest in Hanna Ore Mining Co., Buffalo Iron Mining Co., annual cap., 250,000 tons and Wickwire Mining Co., annual cap., 200,000 tons; Wickwire Limestone Co., with quarry at Gasport, N. Y., annual cap., 250,000 tons.

Works at Buffalo:

Harriet Furnaces: X, 80' x 20' 6", blt. 1907-08, f. o. Oct. 16, 1908, relined 1919; Y, 85' x 21' 6", blt. 1909-10, f. o. Oct. 1, 1910, relined 1919; 8 stoves (4 Julian Kennedy, 80' x 20', 4 McKee, 80' x 22'); 6 steam blowing eng. (100,000 cfm.); 20 water-tube boilers, 7,600 H. P., furnish power also for steel works and wire mill; one 3-strand Uehling pig casting machine; briquetting plant for flue dust, mill cinder and scale, annual cap., 60,000 tons; slag granulating pit, annual cap., 150,000 tons. By-product coke: Lake ore. Product: basic, foundry and malleable pig iron, annual cap., 300,000 tons.

Steel Works: blt. 1915-16, f. o. Jan. 8, 1917; four 60-ton B. O. H. fur.; one 400-ton mixer; 3 Morgan cont. reheat. fur. with 4 gas prod.; 32" 2-h. 2-st. blooming, 18" 2-h. 6-st. billet; rod mill with 12" 2-h. 6-st. and 10" 2-h. 10-st. Product: steel ingots, annual cap., 170,000 tons; blooms and billets, 160,000 tons; wire rods, 120,000 tons; small billets, 30,000 tons.

Wire Mill: blt. 1917-18, f. o. 1918; 600 wire drawing blocks for wire 1/2" to No. 36 gage; 80 wire nail mach.; 50 tack mach.; 24 barbed wire mach.; 4 galvanizing pans. Product: wire, annual cap., 60,000 tons, galvanized wire, 30,000 tons; wire nails, 300,000 kegs; tacks, 15,000 kegs; barbed wire 15,000 net tons.

WILKES ROLLING MILL CO., 20 Fisk St., Sharon, Pa.

Inc. June 1, 1891 in Pennsylvania. Capital stock: com. auth. \$45,000, issued \$30,000.

William B. Foxall, P. & G. M.; Samuel Wilkes, V. P.; James W. Foxall, Sc., G. S. M. & P. A.; Benjamin F. Wilkes, T.; John C. Wilkes, A.

Works at 20 Fisk St., Sharon: blt. 1891, f. o. 1892; 4 double puddling fur.; one squeezer; 18" 3-h. 1-st. muck bar; one 3-d. billet reheating

fur.; 1 sheet and 1 pair fur.; 1 hot black sheet mill (24"); 1 stand cold rolls (24"); 1 box annealing fur.; 1 Mesta pickling mach.; 1 set for terne plates.

Product and annual cap.: 7,500 tons muck bar, 5,000 tons black sheets, flat and corrugated, for galvanizing, etc.

Williams, L. M., Richmond, Va. (Owner), see 1916 Directory, p. 355. Union Furnace sold to Intermont Coal & Iron Corp., Big Stone Gap., July 1, 1916.

Williston Steel Foundry Co., Ltd., Halifax, N. S., see 1916 Directory, p. 356. Crucible steel plant destroyed by Halifax explosion, Dec. 6, 1917.

Williamsport Iron & Nail Co., Williamsport, Pa., see 1916 Directory, p. 356, plant destroyed by fire July 23, 1917 and not rebuilt. Company liquidated.

Wilmington Steel Co., Wilmington, Del., incorporated May 10, 1916, a subsidiary of Midvale Steel & Ordnance Co.; acquired the Old Ferry Mill, Wilmington, from D. J. Driscoll, May 12, 1916. Wilmington Steel Co. was subsequently merged in Midvale Steel & Ordnance Co.

Wisconsin Steel Co., Chicago, Ill., see 1916 Directory, p. 356; plants taken over by International Harvester Co. in 1917. Wisconsin Steel Co. now acts only as sales agents for steel products.

WITHERBEE, SHERMAN & CO., Port Henry, N. Y.

Inc. 1900 in New York. Capital stock: com. \$3,000,000.

L. W. Francis, P.; Moses Taylor, V. P.; R. E. Rogers, Sc. & T.; M. L. Mosier, G. S. M. for ores and iron; at 2 Rector St., New York. George C. Foote, V. P. & G. M.; A. E. Hodgkins, C.; G. L. Shook, G. S. Furnace; at Port Henry, N. Y. A. M. Cummings, G. S. Mines; L. C. Taft, P. A.; at Mineville, N. Y. Edmund Mortimer, G. S. M. fertilizer; at Grafton, Mass.

Sales offices: 2 Rector St., New York and Grafton, Mass.

Brand: "Champlain" for pig iron.

The company operates iron ore mines at Mineville and Port Henry, N. Y., annual cap., 1,000,000 tons of magnetite ore and concentrates; fertilizer plants at Mineville and Albany, N. Y.; and a blast furnace at Port Henry, N. Y.

Port Henry Furnace, Port Henry, N. Y.: 1 stack, 80' x 16', blt. 1872-73, rebld. 1912, relined 1919; 5 stoves (2 McClure, 95' x 20'; 3 Foote, 80' x 16'); 2 turbo-blowers (45,000 cfm.); 6 water-tube boilers, 1,756 H. P. Pittsburgh Coal Washer Co. single-strand pig casting machine. Conn. coke: local magnetic concentrates. Product: foundry, malleable, basic and low-phosphorus pig iron, annual cap., 65,000 tons.

WITHEROW STEEL CO., 210-214 Keystone Bldg., Pittsburgh, Pa.

Inc. Mar. 16, 1914 in Pennsylvania. Capital stock: com. \$825,000.

W. P. Witherow, P.; L. J. Lind, V. P. & G. S. M.; William G. Watt, Sc., T. & P. A.; C. N. Magnuson, A.; George Baehr, G. S.

Works at Neville Island: blt. 1916-17, f. o. Jan., 1917; cont. heat. fur.; 14" 3-h. 7-st. and 9" 3-h. 5-st. bar mills.

Product: merchant bars, flats, angles, channels and small shapes, annual cap., 75,000 tons.

Wood (J) and Brothers Co., Conshohocken, Pa., see 1916 Directory, p. 357. Sold to the Alan Wood Iron and Steel Co., March 14, 1917.

Woodstock Iron & Steel Corporation, Anniston, Ala., see 1916 Directory, p. 358; leased Woodstock Furnaces, at Anniston, in April, 1916, for three years to Woodstock Operating Corporation. Woodstock Operating Corporation acquired entire properties of the Woodstock Iron & Steel Corporation in July, 1917, through purchase of bond issue and capital stock of that company.

WOODSTOCK OPERATING CORPORATION, Anniston, Ala.

Inc. April 3, 1916.

J. B. Carrington, P.; T. D. Donoho, Sc.

Brand: "Woodstock."

Woodstock Furnace, Anniston (leased; owned by The Woodstock Iron & Steel Corporation): 1 stack, 78' x 17', last rebt. 1919: 8 stoves (7 Whitwell side-comb., 1 Kennedy center-comb.); 4 steam blowing eng. (50,000 cfm.); 10 water-tube boilers 1,250 H. P.; Dwight & Lloyd sintering plant for pyrites cinder, annual cap., 72,000 tons. Furnace B dismantled in 1918. Coke: local brown hematite ore. Iron ore mines, annual cap., 70,000 tons; limestone quarry at Rock Springs, Ala., annual cap., 72,000 tons. Product: foundry pig iron, annual cap., 78,000 tons.

WOODWARD IRON CO., Woodward, Ala.

Inc. 1911 in Delaware. Capital stock: com. \$10,000,000; pref. 6% cum. \$3,000,000.

A. H. Woodward, Ch.; Frank H. Crockard, P.; Herbert E. Smith, Sc. & G. S. M.; D. E. Wilson, T.; F. E. Curtis, A.; H. M. Urban, G. M.; J. H. Leonard, P. A.

Selling agents:

Birmingham, T. H. Benners & Co.

Boston, J. O. Henshaw.

Chicago, Hickman, Williams & Co.

Cincinnati, Walter Wallingford & Co.

Louisville, Hickman, Williams & Co.

New York, Phillips Isham.

Philadelphia, J. J. Mohr & Sons.

St. Louis, Hickman, Williams & Co.

Brands: "Vanderbilt" and "Woodward."

Vanderbilt Furnaces, Boyles, Ala.: 2 stacks; No. 1, 78' 9" x 15' 5", blt. 1890, last rebt. 1901; No. 2, 50' x 18', blt. 1906-08, f. o. May 5, 1908; 8 stoves, (4 Massicks & Crooke, 57' 2" x 16' 6"; 4 Nelson, 85' x 20'); 4 steam blowing eng. (75,000 cfm.); 14 water-tube boilers, 4,700 H. P. Alabama coke: local ore. Product: soft foundry and gray forge pig iron, annual cap., 130,000 tons.

Woodward Furnaces, Woodward, Ala.: 3 stacks; No. 1, 90' 8" x 22', blt. 1882-83, rebt. 1913; No. 2, 85' x 20', blt. 1886, rebt. 1907-08; No. 3, 85' 6" x 20', blt. 1902-05, f. o. June 23, 1905; 15 hot blast stoves (5 Foote 110' x 22', 4 Foote 90' x 20', 6 Whitwell 80' x 20'); 14 steam blowing eng. (500,000 cfm.); 40 water-tube boilers, 15,000 H. P. By-product coke: local ore. Foundry and machine shop for own use. Product: basic, foundry and forge pig iron, annual cap., 360,000 tons.

By-product Coke Plant at Woodward, consisting of 170 Koppers and 60 Wilputte coke ovens, annual cap., 1,014,000 net tons coke. By-product recovery plant. Edison benzol plant, annual cap., 1,000,000 gals. of light oil. Beehive coke plant at Woodward with 300 beehive coke ovens, annual cap., 165,000 net tons. Limestone quarry, near Woodward, annual cap., 90,000 tons.

Company owns about 51,000 acres coal lands at Dolomite, Mulga, Short Creek, and Blossburg, Ala., annual cap. of coal mines, 1,750,000 tons. Also owns about 5,000 acres red ore lands and several thousand acres undeveloped brown ore lands, annual cap., of ore mines, 1,500,000 tons hard, and 100,000 tons soft ore.

WORCESTER PRESSED STEEL CO., Randolph Road and Barber Ave., Worcester, Mass.

Inc. Sept., 1904 in Massachusetts. Capital stock: com. \$200,000. John W. Higgins, P. & T.; Arthur P. Higgins, V. P. & Sc.; Ellenton W. Ward, A.; Donald S. Michelsen, G. M.; R. G. Ashman, S. & S. M. Steel Dept.; H. P. Harris, S. M. Stampings Dept.; J. J. Glass, P. A.

Sales offices:

Chicago, E. P. Bartlett Co., 15 North Jefferson St.
 Detroit, C. C. Limbocker Co., 611 Central Ave.
 Indianapolis, Paul R. Jordan & Co., 28 South Meridian St.
 New York, The Dickey Steel Co., Inc., 233 Broadway.
 St. Louis, E. C. Hanpeter, 513 Star Bldg.
 San Francisco, Wm. P. Horn Co., Rialto Bldg.

Works at Worcester: Will add rolling mill, construction to begin April 1, 1920 to be completed about Jan. 1, 1921; 1 cont. billet heat. fur.; 14" 2-h. and 3-h. 9-st. Belgian mill, annual cap., 25,000 tons hot rolled strip steel, hoops and bands. Cold mills: two 8¼" x 10" 3-h. 3-st., one 8¼" x 10" 2-h. 1-st., one 10" x 14" 2-h. 2-st., one 12" x 14" 3-h. 3-st., one 12" x 14" 2-h. 2-st.; 85 power and hydraulic cold forging presses (1-ton to 1,500-ton); 4 box annealing fur.; 2 pickling mach.; 12 pickling tanks.

Product: stampings, punchings, cold formed and extended shapes, 5,000 tons; cold rolled strip steel and shapes, 12,000 tons; pressed steel pulleys, light and heavy metal stamping and punching, deep drawing, machining and welding.

Worth Brothers Co., Coatesville, Pa., see 1916 Directory, p. 359; acquired by Midvale Steel & Ordnance Co., October 13, 1915, and subsequently merged in Midvale Steel & Ordnance Co.

WORTH STEEL CO., Claymont, Del.

W. P. Worth P.

Works at Claymont, Del.: construction begun May, 1917; 4 B. O. H. fur. (100-ton); 44" x 160" sheared plate mill; first plates made Sept., 1918; building 4 B. O. H. fur. (100-ton) and 120" sheared plate mill, to be in operation by fall of 1920. Flanging department.

Product: steel ingots, annual cap. 200,000 tons; sheared plates, ship, tank, boiler and bridge plates, annual cap., 125,000 tons.

WORTHINGTON PUMP & MACHINERY CORPORATION,
115 Broadway, New York, N. Y.

Inc. April 20, 1916 in Virginia. Capital stock: com. auth. \$15,000,000, issued \$12,992,149; pref. Class A, 7% cum. auth. \$10,000,000, issued \$5,592,833; pref. Class B, 6% cum. auth. \$11,000,000, issued \$10,321,671; bonds \$588,900.

C. Philip Coleman, P.; James E. Sague, V. P.; Leon P. Feustman, V. P.; F. H. Jones, V. P.; C. Neal Barney, Sc.; William H. Baumes, T.; J. E. Horn, A.; C. M. Finney, C.; E. T. Fishwick, G. S. M.; C. W. Hodges, P. A.

Sales offices in the larger cities.

Company has works at East Cambridge and Holyoke, Mass.; Harrison, N. J.; Buffalo, N. Y.; Hazleton and Pittsburgh, Pa.; Elmwood Place, Ohio; and Cudahy, Wis.; for the manufacture of machinery. Steel plant is connected with Snow Holly Works, Buffalo, N. Y.

Snow Holly Works, Buffalo: Steel Casting Dept., blt. 1902, f. o. Dec., 1902; one 5-ton Tropenas converter; 3 cupolas. Gray iron, semi-steel and brass foundry. (Formerly owned and operated by International Steam Pump Co.; taken over by Worthington Pump & Machinery Corp., April 22, 1916.)

Product: steel castings for own use in manufacture of pumps, engines and machinery; annual cap., 1,500 tons; gray iron and semi-steel castings, 13,000 tons.

WROUGHT WASHER MANUFACTURING CO., Milwaukee, Wis.

Fred Dopke, P.; Charles H. Disch, Sc.

Branch office: San Francisco, Cal.

Works at Milwaukee: one 3-d. heat. fur.; 16" 2-h. 2-st. sheet mill. Roll sheets from sheet bars for own use only.

Product: washers, punched and sheared plate specialties, corner irons, anchor rods and straps, cross arm braces, etc.

WURSTER (F. W.) & CO., Inc., 375 Kent Ave., Brooklyn, N. Y.

Inc. July, 1904 in New York. Capital stock: com. \$200,000.

F. W. Wurster, P. & T.; Ralph H. Tiebout, V. P.; Ralph I. Perry, V. P.; Edward T. Horwill, Sc.

Works at 375 Kent Ave., Brooklyn: blt. 1890, f. o. 1891; 5 heat. fur. (two 2-d., three 3-d.); 18" 3-h. 2-st. bar, 10" 3-h. 4-st. guide. Fuel, coal. Axle works with 4 ham. for wagon, truck and automobile axles.

Product: scrap bar, iron and steel merchant bars, concrete bars; annual cap., 3,000 tons scrap bars, 6,000 tons merchant bars, 750 tons axles.

WYOMING SHOVEL WORKS (The), Wyoming, Pa.

Est. 1873, inc. June 29, 1893 in Pennsylvania. Capital stock: com. \$500,000; pref. 7% debentures \$300,000.

Nathaniel G. Robertson, P. & G. M.; C. A. Keller, A.; L. E. Webster, G. S.; H. T. Potter, G. S. M.; J. W. Lewis, P. A.; at Wyoming. G. d'A. Belin, Sc. & T.; at Scranton, Pa.

Sales offices: Chicago, G. E. Geer, 347 Peoples Gas Bldg.; New York, N. E. Brooks, 141-149 Centre St.; San Francisco, C. L. Lewis, 268 Market St.

Works at Wyoming: two 2-d. heat. fur.; 3 black sheet mills (22' x 36"). Fuel, anth. and bit. coal.

Product: shovels, annual cap., 100,000 dozen; shovel plate and spring steel sheets 6 to 17 gage, annual cap., 6,000 tons.

YORK FERRO-ALLOYS CO., York, Pa.

Inc. June 5, 1919 in Pennsylvania. Capital stock: com. \$200,000. Robert W. Emerton, P.; George Marlow, Sc. & T.; Lyon Smith, G. S.; at York. David Taylor, V. P., G. S. M. & P. A.; at 30 Church St., New York and Symes Bldg., Denver, Col.

Works at Windsor & Hudson Sts., York, Pa.: 2 special electric furnaces for manufacture of ferro-alloys, const. begun July 1, 1919, first operated Jan. 26, 1920. Electric power from York Haven Power Co., York Haven, Pa.

Product: ferro-tungsten, ferro-molybdenum, ferro-vanadium and ferro-uranium, annual cap., 200 tons.

Youngstown Iron & Steel Co., Youngstown, Ohio, see 1916 Directory, p. 362, acquired by Sharon Steel Hoop Co., Sharon, Pa., March 1, 1917.

YOUNGSTOWN SHEET & TUBE CO. (The), Stambaugh Bldg., Youngstown, Ohio.

Inc. Nov., 1900 in Ohio. Capital stock: com. auth. \$20,000,000, issued \$18,496,000; pref. 7% cum. auth. \$10,000,000, issued \$9,934,300.

James A. Campbell, P.; C. S. Robinson, V. P.; Richard Garlick, V. P. & T.; W. E. Manning, V. P. & G. S. M.; Walter E. Meub, Sc.; W. J. Morris, A. Sc. & A. T.; J. J. Brant, A.; W. C. Reilly, G. S.; E. G. Murray, P. A.; at Youngstown. H. D. Dalton, V. P.; at Cleveland, Ohio.

Sales offices:

Atlanta, Ga., W. W. Brown, Healey Bldg.
Boston, George A. Taylor, 120 Franklin St.
Chicago, F. A. Lathrop, McCormick Bldg.
Cleveland, G. G. Stuart, Leader-News Bldg.
Dallas, H. H. Richardson, Great Southern Life Bldg.
Denver, F. S. Rutherford, First National Bank Bldg.
Detroit, G. W. Bostwick, Dime Savings Bank Bldg.
New York, W. B. Blowers, 30 Church St.
Philadelphia, W. B. Blowers, Pennsylvania Bldg.
Pittsburgh, E. S. Rooney, Oliver Bldg.
St. Louis, H. L. Miller, 1139 Olive St.
San Francisco, J. H. Gilhuly, 604 Mission St.
Seattle, G. F. Thompson, Central Bldg.

Export sales representative: Consolidated Steel Corporation, 165 Broadway, New York.

The company owns the capital stock of the following subsidiary companies:

The Continental Supply Co., St. Louis, Mo. Distributors of oil country tubular products.

Buckeye Coal Co., Youngstown, Ohio, operating coal mines in Greene Co., Pa.

Buckeye Land Co., East Youngstown, Ohio.

The Youngstown Steel Products Co., Youngstown, Ohio.

Youngstown Plant, Youngstown, Ohio: Hubbard Furnaces; 2 stacks, No. 1, 80' x 19', blt. 1867, last rebt. 1910, relined 1918; No. 2, 80' x 20', blt. 1872, last rebt. 1915, relined 1917; nine Kennedy 2-pass center-combustion stoves, 82' x 22'; 4 steam blowing eng. (77,620 cfm.); 11 water-tube boilers, 5,700 H. P.; 1 Uehling double-strand casting machine. By-product coke: Lake ore. (Formerly owned by The Andrews & Hitchcock Iron Co.; acquired by The Youngstown Sheet & Tube Co., April 8, 1916). Product: bessemer, basic, foundry and mill pig iron, annual cap., 300,000 tons.

Youngstown Furnaces: 4 stacks, 88' x 22'; "A" blt. 1907-08, relined 1914; "B" blt. 1907-08, relined 1919; "C" blt. 1909-10, relined 1914; "D" blt. 1912-13, relined 1918; 16 Kennedy center-combustion stoves, 100' x 22'; 4 steam blowing eng. and 1 turbo-blower (232,000 cfm.); 34 water-tube boilers, 17,068 H. P., furnish power also to steel plant and blooming mill; 1 four-strand Uehling casting mach.; 4 slag granulating pits, annual cap., 580,000 tons. By-product coke: Lake ore. Foundry for own use, annual cap., 7,000 tons. Product: bessemer, basic, foundry and mill pig iron, annual cap., 780,000 tons.

By-product coke plant: 306 Koppers cross regenerative by-product coke ovens, annual cap., 1,500,000 net tons coke. By-product recovery plant. Semet-Solvay benzol plant.

Steel Works: Bessemer Dept.: blt. 1905-06, f. o. Aug. 22, 1906; two 12-ton converters; 5 cupolas; two 300-ton metal mixers; annual cap., 780,000 tons. O. H. Dept.: blt. 1911-13; f. o. May 1, 1913; twelve 100-ton B. O. H. fur.; one 1300-ton metal mixer; annual cap., 720,000 tons ingots.

Rolling Mill Dept.: blt. 1901-02; 24 double puddling fur., 2 busheling fur.; 2 squeezers; fifteen 4-d. regen. heat. fur.; 10 cont. heat. fur. (5 Laughlin, 5 Morgan); 78 gas producers; sixteen 4-hole soaking pits with 14 gas producers; 44" 2-h. 1-st. blooming, 40" 2-h. 1-st. blooming; 18" 2-h. 10-st. cont. billet; 18" 2-h. 8-st. cont. sheet bar; 10" 2-h. 10-st. skelp; 20" to 16" 2-h. 6-st. skelp; 18" skelp with 2-st. 3-h. and 1-st. 2-h.; two 10" 2-h. 16-st. rod.; 12" 2-h. 9-st. merchant; 9" 2-h. 12-st. merchant; 32" and 22" x 96" 3-h. sheared plate; 42" universal plate with rolls 27" x 72" used for skelp only; 15 hot black sheet mills (six 26", nine 28"); 7 stands cold sheet mills (two 42", four 44", one 60"); 8 double annealing fur.; 4 pickling mach.; 6 galvanizing pots, annual cap. 72,000 tons galv. sheets. Tube mill: 5 butt-weld and 5 lap-weld fur.;

4 galv. pots. Butt-weld pipe $\frac{1}{8}$ " to 3", lap-weld 2" to 20". Building new lap-weld pipe mill, to be completed about July 1, 1920, annual cap., 60,000 tons. Wire mill dept.: 202 wire drawing blocks, wire $\frac{1}{8}$ " to 20 gage; 188 wire nail mach.; 48 barbed wire mach.; 17 wire fence mach.; 3 galv. pans. Conduit plant: blt. 1912-13; Rigid dept.; black enamel and electro-galvanized conduit, annual cap., 28,500 tons. Flexible dept.; armored flexible conduit and armored conductor, annual cap., 30,000,000 feet. Product and annual cap.: 1,250,000 tons blooms, billets, slabs and sheet bars; 1,222,000 tons finished hot rolled products, including 534,000 tons skelp, 225,000 tons sheared plates, 225,000 tons merchant bars, light structural shapes, hoops and bands and bolt and nut rods, 88,400 tons black sheets, 149,600 tons wire rods; 72,000 tons galvanized sheets; 450,000 tons black pipe, 110,000 tons galvanized pipe; 126,000 net tons plain wire, 70,000 net tons galvanized wire, 1,350,000 kegs wire nails, 43,500 net tons barbed wire, 22,500 net tons wire fencing.

ZENITH FURNACE CO., West Duluth, Minn.

Inc. May 15, 1902 in Minn. Capital stock: com. \$1,500,000.

W. B. Castle, P. & G. M.; C. W. Andrews, V. P. & T.; Oscar Mitchell, Sc.; A. E. Bennett, A. & P. A.; Fred C. Harris, G. S.

Selling agents: Pickands, Brown & Co., Chicago.

Brand: "Zenith."

Zenith Furnace, Duluth: 1 stack, 78' 6½" x 16' 6", blt. 1889-90, last rebt. 1914, relined 1918; 4 side-combustion stoves, 80' x 20'; 4 steam blowing eng. (24,000 cfm.); 8 water-tube boilers, 3,200 H. P. By-product coke: Lake ore. By-product coke plant, 65 Otto-Hoffman coke ovens, by-product recovery plant, and Badger benzol plant. Annual cap., 120,000 net tons coke: 480,000 gal. light oil.

Product: malleable and foundry pig iron, annual cap., 90,000 tons.

ZIMMERMAN STEEL CO. (The), Bettendorf, Iowa.

Inc. May, 1914 in Iowa. Capital stock: com. auth. \$275,000, issued \$266,500; pref. 7% cum. auth. \$70,000, issued \$68,000; bonds \$50,000.

Wm. C. F. Zimmerman, P.; J. W. Bettendorf, V. P. & G. M.; H. V. McClusky, Sc.; F. W. Zimmerman, G. S.; at Bettendorf. J. Reed Lane, T.; at Davenport, Iowa.

Works at Bettendorf: blt. 1915; one 5-ton Snyder electric fur.; blt. 1918, first electric steel, Aug. 1, 1918; one 3-ton converter (idle).

Product: steel stump pullers, etc.; steel castings for own use and for sale, annual cap., 2,400 tons electric steel castings.

ADDENDA.

ASHTABULA STEEL CO. (The), Ashtabula, Ohio.

Building works at Ashtabula for the manufacture of steel black sheets, galvanized sheets and flat and corrugated sheets; construction commenced May 15, 1920.

BEAVER VALLEY ALLOY FOUNDRY CO., Monaca, Pa.

Inc. Feb. 19, 1920 in Pennsylvania. Capital stock: com. auth. \$30,000, issued \$19,000.

C. S. Marshall, P.; W. L. Forster, V. P. & G. M.; R. A. Haddock, Jr., Sc.; at Monaca. C. E. Coleman, T.; at Rochester, Pa.

Works at Monaca: building small oil-burning crucible fur.

Product: crucible steel castings under 100-lb. for sale and own use; nickel and chrome alloy steel castings; annual cap., 300 tons.

CAMBRIDGE STEEL CO. (The), Cambridge, Ohio.

Inc. Nov. 29, 1919 in Ohio. Capital stock: com. auth. \$300,000, all issued; pref. 8% cum. auth. \$200,000, all issued.

T. W. Scott, P.; H. A. Forsythe, V. P.; W. M. Verner, Sc., T., G. S. M. & P. A.; O. O. Bell, G. M.; J. C. Nichols, G. S.

Sales agents: Chicago, Ferro-Concrete Products Co., Monadnock Bldg.; Cleveland, J. E. Rawson, Rose Bldg.

Works at Cambridge: construction commenced Jan. 1, 1920; will probably be completed Aug. 15, 1920; 1 cont. coal reheating fur.; two 16" slitting and roughing (2-h. 1-st. slitting and 3-h. 2-st. roughing) and three 14" 3-h. 2-st. merchant mills.

Product and annual cap.: 16,000 tons structural shapes for bedsteads, agricultural implements, etc., and 32,000 tons merchant and deformed and twisted concrete bars.

CHAPMAN PRICE STEEL CO., Indianapolis, Ind.

Inc. 1910 in Indiana. Capital stock: com. auth. \$1,200,000, all issued; pref. 7% cum. auth. \$300,000, all issued.

Niles Chapman, P. & G. M.; George C. Haerle, 1 V. P.; J. J. Beck, 2 V. P.; R. H. Lewis, 3 V. P.; J. H. Little, Sc.; L. H. Price, T. & G. S. M.

Plans to build works at Indianapolis, to be equipped with 4 comb. sheet and pair fur.; 4 annealing fur., 4 hot sheet mills (one 28" x 44", three 28" x 38", with 2 roughing mills, 28" x 44" and 28" x 38") and 2 cold mills (24" x 44" and 24" x 48"); 1 pickling mach.; 2 galv. pots.

Product: one-pass cold rolled black and galvanized sheets, flat and formed roofing and sheet metal products; annual cap., 22,000 tons black and 20,000 tons galvanized sheets.

CLARK BROTHERS CO., Olean, N. Y.

Steel converter abandoned; no longer makes steel castings. P. 102.

COLUMBIA STEEL CO., San Francisco, Cal.

Rolling mill at Pittsburg, Cal., partly completed; first products rolled March 29, 1920. See p. 111.

CONNELLSVILLE ELECTRIC STEEL CO., Connellsville, Pa.

Capital stock: com. auth. \$105,000, all issued.

G. M. Gadsby, P.; at Pittsburg. F. W. Wright, V. P.; F. E. Markell, T.; at Connellsville.

Works at Connellsville, formerly operated by United States Electric Steel Co., acquired in March, 1920; plant for sale or lease; will not be operated by present owners. See p. 360.

CRUCIBLE STEEL CO. OF AMERICA, Pittsburgh, Pa.

Capital stock: com. auth. \$75,000,000, issued \$37,500,000; pref. 7% cum. auth. \$25,000,000, all issued; bonds \$6,299,000. See page 119.

DETROIT SEAMLESS STEEL TUBES CO., Detroit, Mich.

New plant at Warren Ave. West and Wyoming Ave., Detroit, practically completed; first products rolled May 26, 1920. See page 130.

EASTERN ROLLING MILL CO., Baltimore, Md.

New plant at Colgate, Baltimore, partially completed; first products rolled May 17, 1920. See p. 140.

EICHLEAY, J. P. & W. B., Pittsburgh, Pa.

Works at Hays Station, Allegheny Co., Pa.: blt. and f. o. 1891; 16 double puddling fur., four 3-d. heat. fur.; 3 trains (20" 3-h. 2-st. muck and 18" 3-h. 2-st. and 10" 3-h. 4-st. bar). Fuel, nat. gas. (Formerly owned and operated by the Monongahela Iron and Steel Co., which was controlled by the Carter Iron Co.; acquired by present owners in 1919). For lease.

Product: muck bar, merchant bar iron, staybolt iron, iron chain; annual cap., 15,000 tons.

ELECTRIC ALLOY STEEL CO. (The), Youngstown, Ohio.

Inc. Dec. 24, 1919 in Ohio. Capital stock: com. auth. \$3,000,000, subscribed \$2,000,000.

L. J. Campbell, P.; A. E. Adams, V. P.; W. D. Myres, Sc. & T. Purchased on June 15, 1920, from Universal Steel Co., steel plant and rolling mill at Charleroi, Pa. Will install an additional 6-ton electric fur. For description of plant see p. 366.

GOSHEN FURNACE CORPORATION, Goshen, Va.

Inc. May 17, 1920 in Virginia. Capital stock: com. 10,000 shares, no par value; pref. 8% cum. auth. \$500,000.

George P. Tweed, P.; at 307 Lonsdale Bldg., Duluth, Minn. Walter A. Barrows, 3d, V. P. & G. M.; at Goshen. Dexter A. Tutein, Sc.; E. Arthur Tutein, T.; at 1002 Finance Bldg., Philadelphia. J. E. Rotthaus, A.; at Hokendauqua, Pa.

Selling agents: E. Arthur Tutein, Inc., 50 Congress St., Boston, Mass.; 25 Broad St., New York; 1002 Finance Bldg., Philadelphia. Acquired May 20, 1920, Victoria Furnace, mines and quarries at Goshen, Va., formerly owned by the Southeastern Iron Corp'n. and later leased by Miami Metals Co.

Product: foundry pig iron; annual cap., 70,000 tons. See p. 321.

HADFIELD-PENFIELD STEEL CO. (The), Bucyrus, Ohio.

Took over in May, 1920, the business, plant and good will of the American Clay Machinery Co., at Bucyrus. C. M. Wesson is V. P. & Works Manager; no changes in other officers. See p. 14.

HIGH SPEED TOOLS CORP., 489 Fifth Ave., New York, N. Y.

Manufacture of high-speed crucible steel at Toledo, Ohio, discontinued and equipment removed to works of United States High Speed Steel & Tool Corp'n. at Green Island, N. Y. See pages 172 and 361.

JACKSON, J. T. (Estate of), Philadelphia.

Liberty Furnace, at Liberty Furnace, Va., charcoal stack, dismantled. See p. 189.

KENTUCKY IRON & STEEL CO., Inc., Louisville, Ky.

Inc. in June, 1920 in Delaware.

R. Wilbur Tietjen, P.; John J. Bell, Sc. & T.; at Louisville. I. L. McCord, V. P. & S. A.; at 114 Liberty St., New York.

Company took over in June, 1920, rolling mill at Louisville formerly owned and operated by Louisville Steel & Iron Co., Inc.

Product: muck and scrap bars, iron and steel merchant bars (rounds, flats, squares, angles) and plain, deformed and twisted bars for concrete reinforcement. See Louisville Trust Co., p. 216.

LIBERTY STEEL CO., Morristown, N. J.

Works at Morristown: one 1,000-lb. Rennerfelt electric fur. installed in 1919; f. o. Aug., 1919. Product: high-speed steel.

MCDUGALL-DULUTH SHIPBUILDING CO., Riverside, Duluth, Minn.

Julius H. Barnes, P.; Capt. Alex. McDougall, V. P.; Ward Ames, Jr., V. P.; A. T. Banning, Jr., Sc.; A. Miller McDougall, T. & G. M.; H. K. Pratt, A.; D. B. Carswell, A. G. M.; R. N. Lambert, G. S. M.; F. J. Scanlon, P. A.

Works at 53d Ave. W. and Polk St., Duluth: one 6-ton A. O. H. fur., f. o. Feb. 25, 1920; 2 cupolas; pattern shop.

Product and annual cap.: 7,500 tons acid open-hearth steel castings, 1,000 tons semi-steel castings, 3,000 tons gray iron castings, for own use and sale.

MANSFIELD SHEET & TINPLATE CO., Mansfield, Ohio.

Building four 75-ton B. O. H. fur.; annual cap., 150,000 tons ingots. See p. 225.

MASSACHUSETTS IRON & STEEL CO., Danvers, Mass.

Inc. April 1, 1920 in Massachusetts. Capital stock: com. auth. \$250,000, issued \$200,000; pref. 7% cum. auth. \$250,000, issued \$200,000.

Carl P. Dennett, P.; at 200 Devonshire St., Boston. Harry F. Stimpson, Ch. of Bd. & T.; A. O. Fulton, 1 V. P.; at 128 Sydney St., Cambridge, Mass. Charles S. Clark, 2 V. P., G. S. M. & P. A.; R. S. McCleery, Wks. Mgr.; H. W. Sylvester, G. S.; at Danvers.

Acquired April 1, 1920, works at Danvers, Mass., formerly operated by The Sylvester Co. Makes steel as well as iron merchant bars, etc. See p. 338.

MIAMI METALS CO., Chicago, Ill.

Lease of Victoria Furnace, Goshen, Va., from Southeastern Iron Corpn., given up April 30, 1920 (see p. 232); furnace now owned by Goshen Furnace Corpn. (see Addenda, p. 398).

MILTON MFG. CO. (The), Milton, Pa.

Works at Milton: building one 3-ton Heroult electric fur., to be completed in Aug., 1920; 3 double puddling fur.; one rotary squeezer; 14 powd. bit. coal heat fur. (one 2-d.; seven 3-d. and four 4-d. Lauth; two Laughlin cont.); 20" 3-h. 2-st. muck; 20" 3-h. 4-st., two 16" 3-h. 3-st. and two 10" 3-h. 5-st. bar mills; 4 steam ham. (2-ton to 10-ton); 4 hydraulic forging presses (400-ton to 750-ton); nut dept.

Product and annual cap.: 4,500 tons electric steel castings for sale, 20,000 tons muck and scrap bars, 20,000 tons iron and steel merchant and concrete bars from 1½" to 6½", 16,000 tons spike, chain, bolt, nut, and rivet rods, and 40,000 tons other finished rolled forms; 50,000 kegs cold punched nuts (¼" to 8"), 90,000 kegs hot pressed nuts (¼" to 3"); 5,000 tons forgings. See p. 236.

NATIONAL STEEL ROLLING CO. (The), 44 Cedar St., New York.

Inc. March, 1920 in Maryland. Capital stock: com. auth. \$1,000,000, all issued; pref. 8% cum. auth. \$250,000, all issued.

Philip C. Walsh, Jr., P.; at Newark, N. J. Harry A. Morgan, V. P.; Louis C. Tetard, Sc.; Philip C. Walsh, 3d, G. M. & P. A.; I. L. McCord, G. S. M.; at New York. Allen R. Hoffer, T.; at Philadelphia. Reuben S. Baldwin, C.; at Baltimore. J. Harries Pritchard, G. S.; at Schuylkill Haven, Pa.

Selling agents: Baltimore, Wm. H. Dudley, Keyser Bldg.; New York, Ira L. McCord, 114 Liberty St.

Works at Schuylkill Haven, Pa.: blt. 1873; rebt. and re-equipped 1914 and 1920; 3 busheling fur.; 2 bar heat. fur.; 18" 3-h. 1-st. muck; 18" bar, 10" 3-h. 5-st. bar. (Formerly operated by the Schuylkill Haven Rolling Mill; acquired by present owners April 4, 1920).

Product: merchant bars, light rails, and twisted and deformed reinforcing bars; annual cap., 25,000 tons.

May build a rolling mill at Baltimore in 1920 for manufacture of iron and steel merchant bars.

NEW PROCESS IRON & STEEL CO., Noblesville, Ind.

Plans to build works at Noblesville for manufacture of "T" rails and merchant iron.

NOBLE ELECTRIC STEEL CO., San Francisco, Cal.

William H. French is Receiver; office address of company is now 384 Mills Building.

PENN SEABOARD STEEL CORPORATION, Philadelphia, Pa.

Installed in 1920 at Baldt Works, New Castle, Del., 34" 2-h. 1-st. blooming mill; f. o. June 2, 1920.

Product: billets 4" to 12" square, slabs to 24" wide, for sale and own use; annual cap., from 100,000 to 150,000 tons. See p. 276.

PULASKI IRON CO., Philadelphia, Pa.

New officers: Percival Johnson, P.; at Philadelphia. James Ellwood Jones, V. P.; at Switchback, W. Va. Hugh R. Hawthorne, Sc.; at New York. M. E. Bowman, T.; at Pulaski. See p. 289.

STANDARD PROCESS STEEL CORPORATION, Phillipsburg, N. J.

Company has discontinued the manufacture of steel castings; 10-ton A. O. H. furnace for sale. See p. 325.

SUPERIOR SHEET STEEL CO. (The), Canton, Ohio.

Inc. Oct. 27, 1919 in Ohio. Capital stock: com. auth. \$1,000,000, issued \$800,000; pref. 7% cum. auth. \$1,000,000, will issue \$800,000.

W. W. Irwin, P.; H. A. Roemer, V. P. & G. M.; Urlin K. Becker, Sc. & A.; H. S. Renkert, T.; D. A. Williams, G. S.; M. C. Summers, G. S. M.; P. L. Howenstine, P. A.

Building works at Canton: eight black sheet mills (four 29" x 44" and four 29" x 38"); 8 box annealing fur.; 4 pickling mach.; 4 galv. pots.

Product and annual cap.: black and blue annealed steel sheets (60,000 tons) and galvanized sheets (50,000 tons). See p. 335.

TRANSIT SUPPLY CO., Minneapolis, Minn.

Makes converter steel castings for exclusive use Twin City Lines.

TRUMBULL-CLIFFS FURNACE CO. (The), 11th Floor, Kirby Bldg., Cleveland, Ohio.

Org. 1920. Capital stock: com. 100,000 shares, no par value, all issued; pref. 8% cum. auth. \$4,000,000, none issued.

Wm. G. Mather, P.; S. L. Mather, Sc.; C. G. Heer, T.; C. D. Mason, A.; at 11th Floor, Kirby Bldg., Cleveland. J. Warner, V. P.; at Warren, Ohio.

Plans to build a 600-ton coke blast furnace at Warren, Ohio.

VULCAN MFG. CO., Seattle, Washington.

R. J. Church, Manager.

Works at Seattle: one 1½-ton Greene electric fur. blt. 1919; f. o. in Oct., 1919; 2 cupolas.

Product: electric steel castings for own use and for sale, annual cap. 1,000 tons; specialty, steel castings for automobiles; 3,000 tons gray iron castings for sale.

WAYNE STEEL CO., Erie, Pa.

Open-hearth furnaces completed; first ingots made May 29, 1920. See p. 376.

WICKWIRE SPENCER STEEL CORPORATION, 69 Hammond Street, Worcester, Mass.

Inc. June 23, 1919 in Massachusetts. Capital stock: com. \$1,650,000; pref. 8% cum. \$7,500,000; bonds \$12,500,000.

H. W. Goddard, Ch.; at 390 Main St., Worcester. T. H. Wickwire, Jr., P.; Ward A. Wickwire, V. P.; Elbert Rodgers, P. A.; at Buffalo, N. Y. George M. Thompson, V. P. & G. M.; John A. Denholm, V. P.; P. D. Wesson, Sc.; F. Kilmer, T.; G. V. Pach, C. D. Mixter, and G. H. Creveling, A. T.; John Wheeldon, G. S.; Allan Fraser, G. S. M.; at 69 Hammond St., Worcester, Mass.

Main sales offices:

Worcester, Allan Fraser, General Sales Manager.

Buffalo, L. P. Smith, Sales Agent.

District sales offices:

Boston, J. N. Champlin, 256 Franklin St. (branch of Worcester office).

Chicago, J. J. Collins, 33 W. Austin St.

New York, R. J. Southwell, 120 Broadway.

Philadelphia, L. Jackson, 410 Commerce St.

San Francisco, A. B. Stephens, 111 Townsend St.

Tulsa, Okla., E. R. Neptune, 329 Mayo Bldg. (branch of Chicago office).

Merger on Feb. 26, 1920, of Wickwire Steel Co., Clinton Wire Cloth Co., Morgan Spring Co., Spencer Wire Co., Wright Wire Co. and National Manufacturing Co. For description of plants see Clinton-Wright Wire Co. (page 105) and Wickwire Steel Co. (page 387).

LIST OF BLAST FURNACES IN THE UNITED STATES
AND CANADA.

TABLE OF ABBREVIATIONS.

Kinds of pig iron made.	For sale.	For sale and for own use.	For own use only.
Foundry	A.	A.	a.
Basic	B.	B.	b.
Bessemer	C.	C.	c.
Low-phosphorus	D.	D.	d.
Malleable	E.	E.	e.
Forge	F.	F.	f.
Ferro-silicon	G.	G.	g.
Ferro-manganese	H.	H.	h.
Spiegeleisen	I.	I.	i.
Ferro-phosphorus	J.	J.	j.

Charcoal blast furnaces are designated by a * against number of stacks.

Blast furnaces operated alternately are designated by a † and the annual capacity given for such furnaces is based on such operation.

Blast furnace plants which have not been in operation since 1914 are designated by the insertion, in parentheses after the name of the company, of the year when last operated.

UNITED STATES.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
ALABAMA.			
Alabama City.			
Gulf States Steel Co.	1	100,000	a., b.
Anniston.			
Woodstock Operating Corp.	1	78,000	A.
Attalla.			
Eagle Furnace Co. (idle)	1*	12,000	A.
Bessemer.			
Tenn. C., I. & R. R. Co.	5	385,200	A., b., d., f., h., i.
Birmingham (see also North Bir- mingham).			
Sloss-Sheffield S. & I. Co. (City Furnaces)	2	180,000	A., B., F.
Tenn. C., I. & R. R. Co. (Alice Furnace)	1	117,700	A., B., F.
Boyles.			
Woodward Iron Co. (Vanderbilt)	2	130,000	A., F.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Ensley.			
Tenn. C., I. & R. R. Co.	6	766,100	A., B., F.
Florence.			
Sloss-Sheffield S. & I. Co. (Phila- delphia Furnace)	1	85,000	A., F.
Gadsden.			
The Alabama Co. (Etowah Furnaces)	2	200,000	A., B., F.
Holt.			
Central Iron & Coal Co.	1	85,000	A., F.
Ironaton.			
The Alabama Co. (Clifton Fur- naces)	2	100,000	A., D.
Jenifer.			
Jenifer Iron Co.	1	50,000	A.
North Birmingham.			
Sloss-Sheffield S. & I. Co.	2	180,000	A., B., F.
Oxmoor.			
Tenn. C., I. & R. R. Co.	2†	71,200	A., B., F.
Rock Run.			
The Bass Foundry & Machine Co.	1*	18,000	A.
Sheffield.			
Sheffield Iron Corpn.	1	90,000	A.
Sloss-Sheffield S. & I. Co. (Hattie Ensley Furnaces)	2	183,500	A., F.
Shelby.			
Shelby Iron Co.	2 ^(a)	50,000	A., F.
Talladega.			
Alexander Tison (trustee)	1	45,000	A., F.
Thomas.			
Republic Iron and Steel Co. (Pio- neer Furnaces)	3	325,000	A., F.
Trussville.			
Birmingham-Trussville Iron Co.	1	70,000	A.
Woodward.			
Woodward Iron Co.	3	360,000	A., B., F.

CALIFORNIA.

Heroult.			
Noble Electric Steel Co.	1 ^(b)	5,000	A., D.

COLORADO.

Pueblo.			
The Colorado Fuel & Iron Co..	6	625,000	A., b., c., h., i.

(*) One charcoal and one coke stack.

(b) Stack virtually completed; no machinery installed.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
CONNECTICUT.			
East Canaan.			
Salisbury Iron Corpn.	2 ^(a)	10,000	A.
GEORGIA.			
Cedartown.			
Cedartown Iron Co. (1910) . . .	1*	20,000	A.
Rising Fawn.			
Joel Hurt (1907)	1	72,000	A.
Rome.			
Matthews Iron & Steel Co. . . .	1	30,000	A., D.
Tallapoosa.			
Blue Ridge Iron Co. (1908) . . .	1*	12,000	A.
ILLINOIS.			
Granite City.			
St. Louis Coke & Chemical Co. (building)	1	200,000	B.
Joliet.			
Illinois Steel Co.	4	655,400	c.
South Chicago.			
By-Products Coke Corpn.	2	273,750	B., C., E.
Illinois Steel Co.	11	1,992,100	b., c., E., g., h., i.
International Harvester Co. . . .	3	500,000	c.
The Steel & Tube Co. of America (Iroquois Furnaces)	5	709,000	A., B., C., E., G., H.
INDIANA.			
Gary.			
Illinois Steel Co.	12	2,173,200	b.
Indiana Harbor.			
Inland Steel Co.	3	500,000	A., B.
The Steel & Tube Co. of America (Mark Plant)	1	200,000	A., b., E.
KENTUCKY.			
Ashland.			
Ashland Iron & Mining Co. . . .	2	180,000	A., B., C.
Norton Iron Works	1	100,000	A., C., E.
Grand Rivers.			
Suwanee Iron Co.	2	50,000	A.
Middlesboro.			
Virginia I., C. & Coke Co. . . .	2	88,000	A.

(a) Work has been suspended on a partly built third charcoal stack.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons	Products.
MARYLAND.			
Muirkirk.			
Muirkirk Iron Co., Inc.	1*	6,000	A.
Sparrow's Point.			
Bethlehem Steel Co.	6 ^(a)	840,000	B., C.
MASSACHUSETTS.			
Richmond Furnace.			
Richmond Iron Works	1*	5,000	A.
MICHIGAN.			
Boyne City.			
Charcoal Iron Co. of America . . .	1*	29,000	A., E.
Cadillac.			
Mitchell-Diggins Iron Co.	1*	40,000	A., E.
East Jordan.			
East Jordan Furnace Co.	1*	20,000	A.
Gladstone.			
The Cleveland-Cliffs Iron Co. . . .	1*	38,000	A., E.
Mancelona.			
Antrim Iron Co.	1*	30,000	A., E.
Manistique.			
Charcoal Iron Co. of America . . .	1*	36,000	A., E.
Marquette.			
The Cleveland-Cliffs Iron Co. . . .	1*	42,000	A., E.
Newberry.			
Charcoal Iron Co. of America . . .	1*	29,000	A., E.
River Rouge.			
Detroit Iron & Steel Co.	2	240,000	A., B., E.
Ford Motor Co.	2 ^(b)	365,000	a.
Wells.			
Stephenson Charcoal Iron Co. . . .	1*	24,000	A.
MINNESOTA.			
Duluth.			
Minnesota Steel Co. (Morgan Park)	2	310,500	b., E.
Zenith Furnace Co.	1	90,000	A., E.
MISSISSIPPI.			
Winborn.			
Mrs. William Warmack (1914) . . .	1*	3,500	A.

(a) Five completed and one building stacks; capacity building stack included.

(b) One completed and 1 building stack; capacity building stack included.

BLAST FURNACES.

407

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
MISSOURI.			
Haigart.			
Missouri Iron & Steel Corpn. (building)	1*	54,000	A.
Midco.			
Mid-Continent Iron Co.	1*	36,000	A.
St. Louis.			
Mississippi Valley Iron Co.	1	144,000	A., B., E.
Sligo.			
Sligo Furnace Co.	1*	20,000	A., B., E.
NEW JERSEY.			
Oxford.			
Empire Steel & Iron Co.	1	85,000	A., B., F.
Stanhope.			
Singer Manufacturing Co.	1	50,000	A.
Wharton.			
Replogle Steel Co.	2	292,000	A., B., C.
NEW YORK.			
Buffalo.			
Buffalo Union Furnace Co.	3	350,000	A., B., C., E.
Donner Steel Co., Inc.	2	360,000	B., E.
Rogers-Brown Iron Co.	4	500,000	A., B., C., E.
Wickwire Spencer Steel Corpn.	2	300,000	A., B., E.
Charlotte.			
The McKinney Steel Co.	1	110,000	A., B., E.
Copake Falls.			
W. A. Miles (1903)	1*	5,000	A.
Lackawanna.			
Lackawanna Steel Co.	9	1,440,000	b., c.
North Tonawanda.			
Donner Steel Co., Inc. (Niagara Furnaces)	2	180,000	A., E., H.
Port Henry.			
Witherbee, Sherman & Co.	1	65,000	A., B., D., E.
Standish.			
Northern Iron Co.	1	66,000	D.
Troy.			
The Burden Iron Co.	1	100,000	A., H.
OHIO.			
Bellaire.			
Carnegie Steel Co.	2	276,000	c.
Canton.			
The United Furnace Co.	1	160,000	A., B., E.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Cleveland.			
The American Steel & Wire Co. (Central and Emma Furnaces)	5	817,000	b., c.
The McKinney Steel Co.	4	675,000	A., B., E.
The Otis Steel Co.	2	350,000	A., B., E.
The Upson Nut Co.	1	82,000	b.
Columbus.			
The American Rolling Mill Co. . .	2	200,000	B., E.
Carnegie Steel Co.	2	190,000	c.
Culbertson.			
The Marting Iron & Steel Co. (Lawrence Furnace)	1	70,000	A., B., E.
Dover.			
The Penn Iron & Coal Co.	1	146,000	B., C., E.
Girard.			
A. M. Byers Co.	1	132,000	A., F.
Hamilton.			
The Hamilton Furnace Co.	1	175,000	A., B., E.
Hanging Rock.			
The Hanging Rock Iron Co.	1	60,000	A., B., E.
Hubbard.			
The Youngstown Sheet & Tube Co.	2	300,000	A., b., c., F.
Ironton.			
Belfont Iron Works Co.	1	100,000	C.
The Kelly Nail & Iron Co.	2	50,000	C.
The Marting I. & S. Co. (Alice and Ironton Furnaces)	2	250,000	A., B., E.
The Union Furnace Co.	1	50,000	A., B., E.
Jackson.			
Globe Iron Co.	1	48,000	G.
The Jackson Iron & Steel Co. . .	1	45,000	G.
Star Furnace Co.	1	60,000	A., G.
Leetonia.			
McKeefrey Iron Co.	1	120,000	A., B., C., E., F.
United Iron & Steel Co.	1	140,000	A., E.
Lorain.			
The National Tube Co.	5	835,000 ✓	b., c.
Lowellville.			
Sharon Steel Hoop Co.	1	130,000	B.
Martins Ferry.			
Wheeling S. & I. Co.	1	100,000	c.
Mingo Junction.			
Carnegie Steel Co.	4	585,000	c.
New Straitsville.			
The Bessie Furnace Co.	1	18,000	G.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Niles.			
Carnegie Steel Co.	1 ✓	96,000	c.
Portsmouth.			
Whitaker-Glessner Co.	1	175,000	A., B., E.
Steubenville.			
Carnegie Steel Co.	1 ~	69,000	c.
La Belle Iron Works	2	260,000	a., B.
Struthers.			
The Struthers Furnace Co.	1	180,000	A., B., E., F.
Toledo.			
The Toledo Furnace Co.	2	350,000	A., B., E., F.
Warren.			
The Trumbull-Cliffs Furnace Co.	1 ^(*)	not stated	not stated
Wellston.			
The Milton Iron Co.	1	18,000	G.
The Wellston Iron Furnace Co.	2	127,000	A., C., D., E.
Youngstown.			
The Brier Hill Steel Co.	3	531,000	b.
Carnegie Steel Co. (Ohio Works).	6	999,600	b., c.
Republic Iron & Steel Co.	6	1,020,000	b., c.
The Youngstown Sh. & Tube Co.	4	780,000	a., B., C., f.
Zanesville.			
Carnegie Steel Co.	1	50,000	c.
OREGON.			
Oswego.			
Pacific Coast Steel Co. (1894)	1	15,000	A.
PENNSYLVANIA.			
Alburtis.			
The Thomas Iron Co. (Lock Ridge)	2	42,000	A., F.
Allentown.			
Allentown Iron Mfg. Co.	2*	3,000	A.
Bethlehem.			
Bethlehem Steel Co. (Lehigh Plant)	7	1,000,000	A., B., C.
Birdsboro.			
The E. & G. Brooke Iron Co.	1	85,000	A., B., E., F.
Catasauqua.			
Empire St. & Iron Co. (Crane Fur.)	2	185,000	A., B., F.
Chester.			
Delaware River Steel Co.	1	70,000	A., B., C.; D., E.
Clairton.			
Carnegie Steel Co.	3	510,000	B.
Coatesville.			
Midvale Steel & Ordnance Co.	3	450,000	a., b., C., D., f.

(*) Projected.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Cornwall.			
Bethlehem Steel Co. (Bird Coleman & North Cornwall Fur.) . .	3	90,000	A., B., C., D., H., I.
Curtin.			
Eagle Iron Co.	1*	2,400	A.
Donora.			
The American Steel & Wire Co. . .	2	345,000	b.
Dubois.			
Adrian Furnace Co.	1	90,000	A.
Dunbar.			
American Manganese Mfg. Co. . .	2	150,000	A., C., F., H., I.
Duquesne.			
Carnegie Steel Co. (Duquesne Furnaces)	6	1,017,500	b., g., h.
Easton (Island Park).			
Northern Ore Co.	1	36,000	C.
Emaus.			
Reading Iron Co. (Crumwold Furnace)	1	62,000	A., f.
Emporium.			
Emporium Iron Co.	1	45,000	A.
Erie.			
Perry Iron Co.	1	109,500	A., B., E.
Etna.			
Carnegie Steel Co. (Isabella Furnaces)	3	300,500	b., c., g., H., i.
Everett.			
Thropp, Joseph E. (Earlston Furnace)	1	100,000	A., B., F.
Farrell.			
Carnegie Steel Co.	3	440,900	b.
Harrisburg.			
Central Iron & Steel Co.	2	85,000	A., B., C., E., F.
Marshall, E. E. (Lochiel Furnace). .	1	50,000	A., H., I.
Hokendauqua.			
The Thomas Iron Co.	2	175,000	A., F.
Hellertown.			
The Thomas Iron Co. (Saucon) . .	1	42,000	A., B., E., F.
Johnstown.			
Cambria Steel Co. (Cambria and Franklin)	11	1,700,000	a., b., c., d., h., i.
Josephine.			
The McKinney Steel Co.	2	236,000	A., B., C., E., F.
Kittanning.			
Kittanning I. & S. Mfg. Co. . . .	1	100,000	B.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Lebanon (North Lebanon).			
Bethlehem Steel Co. (Colebrook Furnaces)	2	120,000	A., b., D., f., H., I.
Bethlehem Steel Co. (Lebanon Furnaces)	2	140,000	A., b., c., D., H., I.
Lavino Furnace Co. (Lebanon Furnace).	1	36,000	A., H., I.
Leesport.			
Kiefaber, P. W.	1	22,500	A., F.
McKeesport.			
National Tube Co.	4	660,000	c., d.
Macungie.			
Empire Steel & Iron Co.	1	25,000	A., B., F.
Marietta.			
Lavino Furnace Co.	1	50,000	A., H., I.
Midland.			
Pittsburgh Crucible Steel Co.	2 ^(a)	362,250	b.
Milesburg.			
McCoy-Linn Iron Co.	1*	1,800	A., F.
Monessen.			
Pittsburgh Steel Co.	2	360,000	B.
New Castle.			
Carnegie Steel Co.	4	630,000	c.
Republic Iron & Steel Co. (Atlan- tic Furnace).	1	120,000	c.
Newport.			
Juniata Furnace & Fdy. Co.	1	30,000	A., H., I.
North Braddock.			
Carnegie Steel Co. (Edgar Thom- son Furnaces)	11	1,931,000	b., c.
Palmerton.			
The New Jersey Zinc Co. of Pa.	2	85,000	I.
Parryville.			
Carbon Furnace Co.	1	40,000	A., F.
Pittock (Neville Island).			
Carnegie Steel Co. (Neville Fur- nace)	1	163,300	B., h., i.
Pittsburgh.			
The American Steel & Wire Co. (Shoenberger Furnaces)	2	164,000	c.
Carnegie Steel Co. (Edith and Lucy Furnaces)	3	256,200	a., b., c., d., f., g., H., i.
Clinton Iron & Steel Co.	1	110,000	A., B., E., F.
Jones & Laughlin Steel Co.	7	1,200,000	b., c.

One completed and one building stack; capacity of building stack included.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Pottstown.			
The Eastern Steel Co. (Warwick Furnaces)	3	300,000	A., B., C., D., E., F.
Glasgow Iron Co. (1910)	1	50,000	special pig iron
Punxsutawney.			
Punxsutawney Furnace Co.	1	80,000	A.
Rankin.			
Carnegie Steel Co. (Carrie Furnaces)	7	1,152,100	b.
Reading.			
Reading Iron Co. (Keystone Furnace)	1	100,000	A., F.
Riddlesburg.			
Colonial Iron Co.	1	60,000	A., C., D.
Robesonia.			
The Robesonia Iron Co., Ltd.	1	60,000	A., C., D.
Saxton.			
Thropp, Joseph E.	2	75,000 ^(*)	A., B., F.
Scottdale.			
The McKinney Steel Co.	1	100,000	A., B., E., F.
Sharon.			
Carnegie Steel Co.	1	95,700	b.
Republic Iron & Steel Co. (Hall Furnace)	1	60,000	b., c.
Stewart Iron Co., Ltd.	1	85,000	C., D.
Sharpsville.			
Claire Furnace Co.	1	85,000	B., C., E.
The Sharpsville Furnace Co.	1	70,000	A., B., C., E.
The Shenango Furnace Co.	3	435,000	B., c., E.
Valley Mould & Iron Corpn.	1	108,000	B., C.
Sheridan.			
Lavino Furnace Co.	1	54,000	A., H., I.
Steelton.			
Bethlehem Steel Co.	6	614,000	a., B., c., d.
Swedeland.			
Alan Wood I. & S. Co.	3	475,000	A., B.
Temple.			
Seaboard Steel & Manganese Corpn.	2	50,000†	A., H., I.
Topton.			
Empire Steel & Iron Co.	1	40,000	A., B., F.
West Middlesex.			
The Ella Furnace Co.	1	80,000	B., C.
United Iron & Steel Co.	1	110,000	B., C., E.

(*) Does not include capacity of one stack, long idle, which has no lining.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Woodlawn.			
Jones & Laughlin Steel Co. (Al- quippa Works)	5	900,000	b., c.
Wyebrooke.			
Potts, William M. (1894)	1*	5,400	A.

TENNESSEE.

Allens Creek.			
Bon Air Coal & Iron Corpn. (Mannie Furnaces)	2	50,000	A., G.
Carlisle.			
Dover Iron Co.	1*	4,800	A.
Chattanooga.			
Chattanooga Iron & Coal Corpn. .	1	60,000	A.
Clarksville.			
Red River Company	1	36,000	A., G.
Collinwood.			
Tennessee Valley Iron & Railroad Company	1*	36,000	A.
Cumberland Furnace.			
Warner Iron Co.	1	30,000	A., G.
Dayton.			
Dayton Coal, Iron & Railway Co. (1913)	2	125,000	A.
Goodrich.			
Bon Air Coal & Iron Corpn. (Standard Furnace)	1	24,000	A.
Johnson City.			
The Cranberry Furnace Co. . . .	1	36,000	C., D.
La Follette.			
La Follette Coal & Iron Co. . . .	1	60,000	A.
Napier.			
Napier Iron Works.	1	36,500	A.
Rockdale.			
Gray, J. J., Jr. (Rockdale Furnace)	1	12,000	J.
Rockwood.			
Roane Iron Co.	2	140,000	A., F.
Wrigley (P. O. Lyles).			
Bon Air Coal & Iron Corpn. (War- ner Furnace)	1*	24,000	A.

TEXAS.

Rusk.			
Texas Steel Co.	1	36,000	A., F.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
VIRGINIA.			
Big Stone Gap.			
Intermont Coal & Iron Corpn.	1	35,000	A., F.
Buena Vista.			
Alleghany Ore & Iron Co.	1	40,000	A., B.
Covington.			
The Low Moor Iron Co. of Va.	1	60,000	A.
Glen Wilton.			
Princess Iron Corporation.	1	36,000	A.
Goshen.			
Goshen Furnace Corporation	1	70,000	A.
Graham.			
Marshall, E. E.	1	40,000	A., H., I.
Iron Gate.			
Alleghany Ore & Iron Co. (Alleghany Furnace)	1	30,000	A., B.
Ivanhoe.			
Ivanhoe Furnace Corpn. (1913)	1	25,000	A., B., D.
Low Moor.			
The Low Moor Iron Co. of Va.	2	60,000†	A.
Max Meadows.			
Virginia I., C. & Coke Co.	1	55,000	A.
Pulaski.			
Pulaski Iron Co.	1	90,000	A., F.
Virginia I., C. & Coke Co. (Dora Furnace)	1	58,500	A.
Radford.			
Virginia I., C. & Coke Co.	1	75,000	A.
Reusens.			
Lavino Furnace Co.	1	60,000	A., H., I.
Roanoke.			
Hubbard, John W. (West End Furnace)	1	48,000	A., I.
Virginia I., C. & Coke Co. (Crozer Furnace)	1	60,000	A.
WEST VIRGINIA.			
Benwood.			
National Tube Co. (Riverside)	2	233,000	c.
Weirton.			
Weirton Steel Co.	1	200,000	b.
Wheeling.			
Wheeling Steel & Iron Co.:			
Belmont Furnace	1	75,000	c.
Top Mill Furnace	1	100,000	c.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
WISCONSIN.			
Ashland.			
Charcoal Iron Co. of America	1*	45,000	A., E.
Mayville.			
The Steel & Tube Co. of America	2	200,000	A., C., D., E.
Milwaukee.			
Illinois Steel Co.	2	113,800	A., E.
The Thomas Furnace Co.	1	90,000	C., D., E.
Phelps.			
Carr (W. R.) & Co. (Twinlake Furnace; idle and for sale)	1*	3,000	A.
Spring Valley.			
Spring Valley Iron & Ore Co. (1910)	1	35,000	A., C., E.

CANADA.

NOVA SCOTIA.

Londonderry.			
The Londonderry Iron & Mining Co., Ltd. (1908)	1	35,000	A.
Sydney.			-
Dominion I. & S. Co., Ltd.	6	550,000	A., B.
Sydney Mines.			
Nova Scotia Steel & Coal Co., Ltd.	2†	90,000	a., b.

ONTARIO.

Deseronto.			
Standard Iron Co., Ltd.	1*	20,000	A., E.
Hamilton.			
The Steel Co. of Canada, Ltd.	2	215,000	A., b., E.
Midland.			
Midland Iron & Steel Co., Ltd.	1	35,000	A., C., E.
Ojibway.			
Canadian Steel Corpn., Ltd.	2 ^(a)	Not stated	Not stated
Parry Sound.			
Parry Sound Iron Co., Ltd.	1	30,000	A.
Port Arthur.			
Atikokan Iron Co., Ltd. (1911)	1	45,000	A.
Port Colborne.			
Canadian Furnace Co., Ltd.	1	125,000	A., C., E.
Sault Ste. Marie.			
Algoma Steel Corpn.	4	500,000	A., B., C., E., I.

(^a) Building.

MANUFACTURERS OF FERRO ALLOYS AND PIG IRON IN
ELECTRIC FURNACES, ETC., NOT INCLUDED
IN BLAST FURNACE LIST.

UNITED STATES.

ALABAMA.

Anniston Steel Co., Anniston.
Southern Manganese Corporation, Anniston.

CALIFORNIA.

Noble Electric Steel Co., San Francisco. (Works at Heroult).
Pacific Alloy & Steel Co., Bay Point.

COLORADO.

Ferro Alloy Co. (The), Denver. (Works at Utah Junction).
Pittsburgh Radium Co., Pittsburgh, Pa. (Works at Denver).
Tungsten Products Co., Boulder.

CONNECTICUT.

May (Frank L.) & Co., Inc., New York, N. Y. (Works at Yalesville).

IOWA.

Keokuk Electro-Metals Co., Keokuk.

MAINE.

Maine Power Sales Co., 25 Broad St., New York, N. Y. (Works at Rumford).

MARYLAND.

Shapiro (Morris) and Roney, (John D.), Baltimore. (Works at Highlandtown).
Baltimore Electro-Alloys Co. (The), Baltimore. (Works at Highlandtown).

MONTANA.

Anaconda Copper Mining Co., Anaconda. (Works at Great Falls).

NEW JERSEY.

May (Frank L.) & Co., Inc., New York, N. Y. (Works at Perth Amboy).
Metal & Thermit Corp., 120 Broadway, New York, N. Y. (Works at Jersey City).

NEW YORK.

Atlas Crucible Steel Co., Dunkirk. (Own use).
Carborundum Co. (The), Niagara Falls.
Electro Metallurgical Co., New York, N. Y. (Works at Niagara Falls).
International Paper Co., New York, N. Y. (Works at Niagara Falls).
Metal Alloys, Inc., Watervliet.
Mohawk Improvement Co., Fort Plain.
Niagara Electric Furnace Co., Inc., Niagara Falls.
Norton Co., Worcester, Mass. (Works at Niagara Falls).
Pittsburgh Metallurgical Co., Inc., Niagara Falls.
Titanium Alloy Manufacturing Co. (The), New York, N. Y. (Works at Niagara Falls).
United States Ferro-Alloys Corporation, New York, N. Y. (Works at Niagara Falls).

OREGON.

Western Reduction Co., Portland.

PENNSYLVANIA.

Atlantic Ore & Alloys Co., Philadelphia. (Works closed; company out of business.)
Carnegie Steel Co., Pittsburgh. (Works at Duquesne; own use).
Crucible Steel Co. of America, Pittsburgh. (Own use).
Firth Sterling Steel Co., McKeesport. (Own use).
Hudson Reduction Co., Latrobe.
National Alloy Co., Philadelphia.
Penn Electric Smelting Corporation, New York, N. Y. (Works at Philadelphia).
Standard Chemical Co., Pittsburgh.
Vanadium Alloys Steel Co., Latrobe.
Vanadium Corporation of America, New York, N. Y. (Works at Kirwan and Primos).
York Ferro-Alloys Co., York.

TENNESSEE.

Chattanooga Electro Metals Co., Chattanooga.
Southern Ferro-Alloys Co., Chattanooga.
Tennessee Manganese Co., Knoxville. (Works at Cleveland, Tenn.).

VIRGINIA.

Electro Metallurgical Co., New York, N. Y. (Works at Holcomb Rock).

WASHINGTON.

Bilrowe Alloys Co., Tacoma.
Seattle Smelting Co., Seattle.
Smelters Steel Co., Seattle.

WEST VIRGINIA.

Electro Metallurgical Co., New York, N. Y. (Works at Glen Ferris).

CANADA.

ONTARIO.

Bowmanville Foundry Co., Ltd., Bowmanville. (Own use).
Brebner, D. A., Ltd., Hamilton. (Idle; in process of liquidation).
Cordova Mines, Ltd., Cordova Mines. (Idle; future product not decided).
Electro Foundries, Ltd., Orillia. (Idle; company going out of business).
Electro Metals, Ltd., Welland.
Exolon Co., Ltd., Boston, Mass. (Works at Thorold).
International Molybdenum Co., Ltd., Orillia. (Idle; in process of liquidation).
National Abrasive Co., Boston, Mass. (Works at Niagara Falls, Ont.).
Norton Co., Worcester, Mass. (Works at Chippawa).
Tivani Electric Steel Co., Ltd., Belleville.
Turnbull Electro Metals Co., Ltd., St. Catherines.

QUEBEC.

Canadian Carborundum Co., Ltd., Niagara Falls, N. Y. (Works at Shawinigan Falls).
Canadian Ferro Alloy Co., New York, N. Y. (Works at Shawinigan Falls).
Hull Iron & Steel Foundries, Ltd., Hull.
Leaside Engineering Co., Ltd., Leaside. (Works at Beaupre).
Shawinigan Foundries, Ltd., Shawinigan Falls.

BRITISH COLUMBIA.

Hyatt Steel Products, Ltd., Vancouver.

LIST OF PLANTS MAKING STEEL INGOTS IN THE
UNITED STATES AND CANADA.

TABLE OF ABBREVIATIONS.

Kinds of steel ingots made.	For sale.	For sale and for own use.	For own use only.
Acid open-hearth	A.	A.	a.
Basic open-hearth	B.	B.	b.
Bessemer	C.	C.	c.
Crucible	D.	D.	d.
Electric	E.	E.	e.
Miscellaneous	F.	F.	f.

UNITED STATES.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
ALABAMA.		
Alabama City.		
Gulf States Steel Co.	288,000	b.
Anniston.		
Anniston Steel Co.	19,200	e.
Bessemer.		
National Steel Products Co.	2,000	A.
Ensley.		
Tennessee Coal, Iron & R. R. Co.	1,115,000	b., c.*
CALIFORNIA.		
Huntington Park.		
Southern California I. & S. Co. (building)	33,000	b., e.
Los Angeles.		
Southern California Iron & Steel Co.	28,000	b.
Oakland (Emeryville).		
Judson Manufacturing Co.	55,000	b.
Sacramento.		
Southern Pacific Co.	†	e.
San Francisco.		
Pacific Coast Steel Co.	20,000	b.
South San Francisco.		
Pacific Coast Steel Co.	125,000	b.
Torrance.		
Llewellyn Iron Works	35,000	b.
Union Tool Co.	5,500	B., E.

* Bessemer converters used for duplexing only.

† Steel ingot capacity not stated; see list of steel casting plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
COLORADO.		
Pueblo.		
The Colorado Fuel & Iron Co.	1,138,000	b., c.
CONNECTICUT.		
Bridgeport.		
The American Tube & Stamping Co.	84,500	b.
Collinsville.		
The Collins Co.	4,000	d., f.
Hartford.		
The Connecticut Electric Steel Co.	1,800	E.
New Britain.		
The Stanley Works	15,000	b.
New Haven.		
Penn Seaboard Steel Corporation	40,000	A., B.
Rocky Hill.		
The Hartford Electric Steel Corpn.	*	E.
DELAWARE.		
Claymont.		
Worth Steel Co.	200,000	b.
New Castle.		
Penn Seaboard Steel Corporation	100,000	b.
Wilmington.		
Midvale Steel & Ordnance Co.	135,000	b.
DISTRICT OF COLUMBIA.		
Washington.		
United States Gov., Navy Department, Naval Gun Factory	10,500	a., e.
Washington Steel & Ordnance Co.	40,000	b., e.
GEORGIA.		
Atlanta.		
Atlantic Steel Co.	100,000	b.
ILLINOIS.		
Alton.		
Laclede Steel Co.	100,000	b.
Chicago.		
Chicago Electric Steel Co.	5,000	e.
Trojan Electric Steel Co.	1,800	E.
Chicago Heights.		
Columbia Tool Steel Co.	5,400	d.
Railway Steel-Spring Co.	80,000	b.

* Steel ingot capacity not stated. See list of steel casting plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Granite City.		
National Enameling & Stamping Co.	350,000	b.
Joliet.		
Illinois Steel Co.	732,000	c.
Peoria (South Bartonville).		
Keystone Steel & Wire Co. . . .	100,000	b.
South Chicago.		
Illinois Steel Co.	2,339,800	b., c.,* e.
International Harvester Co. . . .	370,000	c.
Interstate Iron & Steel Co. . . .	250,000	b.
The Steel & Tube Co. of America .	275,000	c.†
West Harvey.		
Allied Steel Castings Co.	‡	A., C.

INDIANA.

Gary.		
Illinois Steel Co.	3,030,000	b., c.**
Indiana Harbor.		
Inland Steel Co.	1,000,000	b.
The Steel & Tube Co. of America .	585,000	b., c.††
Kokomo.		
Kokomo Steel & Wire Co.	120,000	b.

IOWA.

Fort Dodge.		
Fort Dodge Culvert & Iron Mills Co.	12,000	b.
Keokuk.		
Fluid Compressed Steel Co.	4,000	e.

KENTUCKY.

Ashland.		
Ashland Iron & Mining Co.	270,000	b.
Ashland Steel Co.	190,000	c.
Newport.		
The Andrews Steel Co.	250,000	b.

MAINE.

South Portland.		
Portland Iron & Steel Co. (idle) . .	12,000	b.

MARYLAND.

Baltimore.		
Hess Steel Corporation	30,000	e.

* Bessemer converters also used for duplexing. † Bessemer converter to be abandoned.

‡ Steel ingot capacity not stated; see list of steel casting plants.

** Bessemer converters used for duplexing only. †† Bessemer converters building.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Cumberland.		
N. & G. Taylor Co., Inc.	36,000	b.
Sparrows Point.		
Bethlehem Steel Co.	1,170,000	b., c.*
MASSACHUSETTS.		
Lynn.		
General Electric Co.	2,000	E.
Watertown.		
United States Gov., War Department, Watertown Arsenal	†	a., c., d., e.
West Wareham.		
Tremont Nail Co.	25,000	b.
Worcester.		
The American Steel & Wire Co. . . .	180,000	a., b.
MICHIGAN.		
Detroit.		
John A. Crowley Co.	15,000	E.
Ford Motor Co.	not stated	e.
Kalamazoo.		
Harrow Spring Co.	7,000	e.
MINNESOTA.		
Duluth (Morgan Park).		
Minnesota Steel Co.	540,000	b.
Stillwater.		
Twin City Forge & Foundry Co. . .	2,500	E.
MISSOURI.		
Kansas City.		
Black Steel & Wire Co.	15,000	a.
The Kansas City Bolt & Nut Co. (Sheffield Station; building). . .	90,000	b.
St. Louis.		
Scullin Steel Co.	100,000	b.
Warren Steel Casting Co.	†	A., E.
NEBRASKA.		
Omaha.		
Omaha Steel Works	6,000	E.
NEW JERSEY.		
Chrome.		
Chrome Steel Works	37,500	a., d.

* Bessemer converters also used for duplexing.

† Steel ingot capacity not stated; see list of steel casting plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Harrison.		
Crucible Steel Co. of America	64,850	a., d., e.
Driver-Harris Co.	1,750	d., e.
High Bridge.		
Taylor-Wharton Iron & Steel Co.	*	c., e.
Morristown.		
Liberty Steel Co.	not stated	E.
Newark.		
Heller Brothers Co.	1,500	d.
Perth Amboy.		
The C. Pardee Works, Inc.	50,000	b.
Rahway.		
Nagle Steel Co.	31,200	b.
Roebbling.		
John A. Roebbling's Sons Co.. . . .	150,000	a., b.
NEW YORK.		
Brooklyn.		
The Davidson Tool Mfg. Corpn.	425	d., e.
Buffalo.		
American Radiator Co.	*	E.
Atlas Steel Casting Co.	30,000	A.
Donner Steel Co., Inc.	425,000	b.
Sizer Forge Co.	24,000	e.
Wickwire Spencer Steel Corpn.	170,000	b.
Cortland.		
Wickwire Bros.,	40,000	b.
Croghan.		
Wayne Steel & Iron Co. (building).	not stated	E.
Dunkirk.		
Atlas Crucible Steel Co.	25,750	b., d., e.
East Syracuse.		
Onondaga Steel Co.	800	d., e.
Fulton.		
Ontario Electric Steel Co.	7,500	e.
Green Island.		
U. S. High Speed Steel & Tool Corpn.	500	e.
Lackawanna.		
Lackawanna Steel Co.	1,840,000	b., c.†
Lockport.		
Simonds Manufacturing Co.	21,000	d., e.
Poughkeepsie.		
Century Steel Co. of America.	2,400	d.

* Steel ingot capacity not stated; see list of steel casting plants.

† Bessemer converters also used for duplexing.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Syracuse.		
Crucible Steel Co. of America	21,700	d., e.
Halcomb Steel Co.	38,500	d., e.
The Hammond Steel Company, Inc. (Solvay)	12,000	e.
Syracuse Alloy Steel Co. (completed and building plants)	2,000	d.
Watervliet.		
Ludlum Steel Co.	16,000	e.
OHIO.		
Bellaire.		
Carnegie Steel Co.	420,000	e.
Bucyrus.		
The Ohio Steel Foundry Co.	*	a.
Canton.		
The Canton Sheet Steel Co.	150,000	b.
The Canton Steel Foundry Co.	20,000	A.
The Timken Roller Bearing Co.	30,000	e.
United Alloy Steel Corpn.	636,000	b., e.
Cleveland.		
The American Steel & Wire Co.	970,000	b., c.
Cleveland Steel Casting Co.	14,000	A.
Electric Steel & Forge Co.	15,000	e.
The McKinney Steel Co.	700,000	b.
The Otis Steel Co.	103,000	a., b.
The Upson Nut Co.	200,000	b.
Columbia Heights (near Massillon).		
The Central Steel Co.	350,000	b.
Columbus.		
Carnegie Steel Co.	200,000	e.
Lorain.		
The Cromwell Steel Co.	200,000	b.
The National Tube Co.	1,295,000	b., c.
Lowellville.		
Sharon Steel Hoop Co.	250,000	b.
Mansfield.		
Mansfield Sheet & T. P. Co. (bldg.)	150,000	b.
Marion.		
The Marion Steam Shovel Co.	4,000	B.
Middletown.		
✓ The American Rolling Mill Co.	405,000	b.
Mingo Junction.		
Carnegie Steel Co.	600,000	c.

* Steel ingot capacity not stated; see list of steel casting plants.

Location and Operating Company.	Annual capacity: Gross tons.	Products.
Norwalk.		
Crucible Steel Co. of America . .	15,000	b.
Portsmouth.		
Whitaker-Glessner Co.	350,000	b.
Steubenville.		
La Belle Iron Works	420,000	b.
Toledo.		
The Tungsten Steel Co.	150	e.
Toronto.		
Follansbee Brothers Co. (building) .	100,000	b.
Warren.		
The Trumbull Steel Co.	400,000	b.
Youngstown.		
The Brier Hill Steel Co.	600,000	b.
Carnegie Steel Co.	1,400,000	b., c.
Republic Iron & Steel Co.	1,395,000	b., c.
The Youngstown Sheet & Tube Co.	1,500,000	b., c.

OREGON.

Linnton		
Pacific Coast Steel Co., (building) .	25,000	b.

PENNSYLVANIA.

Aliquippa.		
Vulcan Crucible Steel Co.	9,550	a., d., e.
Apollo.		
Apollo Steel Co.	40,000	b.
Avonmore.		
The Fahnstock Mfg. Co.. . . .	7,200	A.
Bethlehem.		
Bethlehem Steel Co. (Lehigh and Saucon Plants)	1,319,600	a., b., c., * d., e.
Birdsboro.		
Birdsboro Steel Foundry & Machine Company	35,000	A., B.
Brackenridge.		
Allegheny Steel Co.	222,000	A., B.
West Penn Steel Co.	150,000	b.
Braddock.		
Sterling Steel Foundry Co. . . .	12,000	A.
Braeburn.		
Braeburn Steel Co.	16,000	d., e.
Bridgeville.		
Universal Steel Co.	20,000	d., e.

* Bessemer converters (Saucon Plant) used for duplexing only.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Burnham.		
Standard Steel Works Co.	not stated	a., b., d.
Butler.		
Forged Steel Wheel Co.	360,000	b.
Charleroi.		
The Electric Alloy Steel Co.	9,500	d., e.
Chester.		
Atlantic Steel Castings Co.	*	A.
Clairton.		
Carnegie Steel Co.	650,000	b.
Coatesville.		
The Lukens Steel Co.	612,000	a., b.
Midvale Steel & Ordnance Co.	650,000	b.
Colona.		
Colonial Steel Co.	62,000	b., d.
Connellsville.		
Connellsville Electric Steel Co.	7,500	E.
Conshohocken.		
American Metallurgical Corporation	2,280	E.
Corry.		
McInnes Steel Co., Ltd.	1,000	d.
Crum Lynne.		
Eddystone Steel Co.	10,000	b.
Donora.		
The American Steel & Wire Co.	750,000	b., c.†
Duquesne.		
Carnegie Steel Co. (Duquesne Wks.).	1,355,300	b., e.
East Carnegie.		
Union Electric Steel Co.	5,000	E.
Economy.		
Standard Seamless Tube Co.	54,000	b., e.
Eddystone.		
Tindel-Morris Co.	24,000	B.
Erie.		
Erie Crucible Steel Co.	400	d.
Erie Forge Co.	70,000	A., B.
Erie Forge & Steel Co.	75,000	B.
National Foundry Co.	5,000	A.
Wayne Steel Co.	40,000	b.
Farrell.		
Carnegie Steel Co.	600,000	b.
Glassport.		
Pittsburgh Steel Foundry Co.	3,000	A., B.

* Steel ingot capacity not stated; see list of steel casting plants.

† Bessemer converters used for duplexing only.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Hanover.		
Vulcan Iron Works	*	A.
Harrisburg.		
Central Iron & Steel Co.	200,000	b.
Harrisburg Pipe & Pipe Bending Co.	75,000	b.
Ivy Rock.		
Alan Wood Iron & Steel Co.	500,000	b.
Johnstown.		
Cambria Steel Co.	1,900,000	a., b., c.
Latrobe.		
Latrobe Electric Steel Co.	13,200	e.
Railway Steel-Spring Co.	102,500	a., e.
Vanadium Alloys Steel Co.	10,100	d., e.
McKeesport.		
Firth-Sterling Steel Co.	9,900	b., d., e.
National Tube Co.	689,000	c.
Midland.		
Pittsburgh Crucible Steel Co.	383,250	a., b.
Monessen.		
Page Steel & Wire Co.	60,000	b.
Pittsburgh Steel Co.	620,000	b.
Monongahela		
Le Moyne Steel Co.	1,350	e.
Moore		
The Drain Steel Co.	50,000	B.
Munhall.		
Carnegie Steel Co. (Homestead Wks.)	2,128,000	b.
New Castle.		
Carnegie Steel Co.	770,000	c.
North Braddock.		
Carnegie Steel Co. (Edgar Thomson)	1,380,000	b., c.
Oakmont.		
Edgewater Steel Co.	85,000	A., B.
Pencoyd.		
American Bridge Co.	240,000	b.
Philadelphia.		
Henry Disston & Sons Iron & Steel Works (Tacony)	15,800	d., e.
The John Illinworth Steel Company (Frankford)	2,500	d.
Midvale Steel and Ordnance Co. (Nictown)	186,750	a., b., d., e.
Tacony Steel Co. (Tacony)	40,000	a.
Taylor-Wharton Iron & Steel Co.	8,000	A.

* Steel ingot capacity not stated; see list of steel casting plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Phoenixville.		
The Phoenix Iron Co.	226,000	b.
Pittsburgh.		
The American Steel & Wire Co.	414,000	b., c.
Brown & Co., Inc.	not stated	d.
Carbon Steel Co.	150,000	b., e.
Crucible Steel Co. of America:		
Black Diamond Works	177,500	a., b., d., e.
Crescent Works	56,000	b., d.
La Belle Works	23,000	a., d.
Singer-Nimick Works.	8,000	d.
The Electro Steel Co., Inc.	1,500	E.
Heppenstall Forge & Knife Co.	18,000	b.
Jones & Laughlin Steel Company (Pittsburgh Works)	1,740,000	a., b., c.*
The McConway & Torley Co.	50,000	A.
Union Steel Casting Co.	18,000	A.
Pottsville.		
The Eastern Steel Co.	200,000	b.
Reading.		
The Carpenter Steel Co.	36,500	b*, d., e.
Sharon.		
Carnegie Steel Co.	150,000	b.
Sharon Steel Hoop Co.	150,000	a., b.
Steelton.		
Bethlehem Steel Co.	643,500	a., b., c.†
Titusville.		
Cyclops Steel Co., Inc.	9,000	d.
Vandergrift.		
American Sheet & Tin Plate Co.	276,000	a., b.
Verona.		
Verona Steel Castings Co.	18,000	B.
Washington.		
Jessop Steel Co.	13,500	d., e.
West Homestead (Mesta Station).		
Mesta Machine Co.	75,000	A.
West Leechburg.		
West Leechburg Steel Co.	40,000	b.
Williamsport (Newberry)		
Pine Iron Works Co.	36,000	b.
Woodlawn.		
Jones & Laughlin Steel Co.	900,000	b., c.*

* Bessemer converters also used for duplexing.

† Bessemer converters used for duplexing only.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
RHODE ISLAND.		
Phillipsdale.		
Washburn Wire Co.	38,300	b.
TEXAS.		
Beaumont.		
Beaumont Iron Works Co. . . .	1,000	e.
UTAH.		
Midvale.		
Utah Steel Corporation.	50,000	b.
VIRGINIA.		
Newport News.		
Newport News Shipbuilding & Dry Dock Co.	800	e.
Richmond.		
Old Dominion Iron & Steel Corpn.	8,000	e.
Roanoke.		
Norfolk & Western Railway Co. .	250	e.
WASHINGTON.		
Seattle.		
Rothert Process Steel Co.	550	e.
Western Rolling Mill Corpn. (pro- jected)	not stated	b., e.
Youngstown.		
Pacific Coast Steel Co.	90,000	b.
WEST VIRGINIA.		
Benwood.		
National Tube Co.	228,000	c.
Wheeling Steel & Iron Co. . . .	225,000	c.
Charleston.		
Becker Steel Co. of America, Inc. .	7,000	d.
Follansbee.		
Follansbee Brothers Co.	100,000	b.
South Charleston.		
United States Gov., Navy Depart- ment, Ordnance Plant	50,000	b., e.
Weirton.		
Weirton Steel Co. (building) . . .	400,000	b.
Wheeling (Warwood).		
Wheeling Steel Casting Co. . . .	6,000	A.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
WISCONSIN.		
Racine.		
Racine Steel Castings Co.	2,500	E.
St. Francis.		
General Steel Co.	24,500	E.
South Milwaukee.		
Bucyrus Co.	12,800	B.
CANADA.		
ALBERTA.		
Redcliff.		
Canadian Western Steel Corpn., Ltd.	15,000	b.
BRITISH COLUMBIA.		
Eburne.		
Vancouver Rolling Mills Co., Ltd.	not stated	a.
Port Moody.		
Hyatt Steel Products, Ltd. (idle)	1,000	e.
MANITOBA.		
Selkirk.		
Manitoba R. M. Co., Ltd. (building)	7,000	a.
NOVA SCOTIA.		
Sydney.		
Dominion Iron & Steel Co., Ltd.	400,000	b., c.*
Sydney Mines.		
Nova Scotia Steel & Coal Co., Ltd.	130,000	b.
ONTARIO.		
Ashbridges Bay (Toronto).		
Baldwins Canadian Steel Corpn.	100,000	e.
Belleville.		
Tivani Electric Steel Co., Ltd.	1,000	E.
Collingwood.		
Canadian Western Steel Corpn., Ltd., (said to have been sold to M. J. Shaw, Toronto)	18,000	a.
Hamilton.		
Dominion Foundries & Steel, Ltd.	132,000	a., b., e.
The Steel Co. of Canada, Ltd.	350,000	b.
Sault Ste. Marie.		
Algoma Steel Corporation	600,000	b., c.*

* Bessemer converters used for duplexing only.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Welland.		
Canadian Steel Foundries, Ltd. . .	48,000	b.
Dillon Crucible Alloys, Ltd. . . .	2,120	d.
The Electric Steel & Metals Co., Ltd.	12,000	E.
QUEBEC.		
Hull.		
The Hull Iron & Steel Foundries, Ltd.	*	c.
Longue Pointe (Montreal).		
Canadian Steel Foundries, Ltd. . .	*	A., B.
Longueuil.		
Armstrong, Whitworth of Can., Ltd.	36,050	B., D., E.
Montreal.		
Canada Cement Co., Ltd.	35,000	B., E.
The Thomas Davidson Manufacturing Co., Ltd.	22,500	E.
Sherbrooke.		
Canadian Brakeshoe Co., Ltd. . .	2,500	E.
Three Rivers.		
La Fonderie d'Acier des Trois Rivières, Ltd. (idle)	20,000	A.

* Steel ingot capacity not stated; see list of steel casting plants.

LIST OF PLANTS MAKING STEEL CASTINGS IN THE UNITED STATES AND CANADA.

TABLE OF ABBREVIATIONS.

Kinds of steel castings made.	For sale.	For sale and for own use.	For own use only.
Acid open-hearth	A.	A.	a.
Basic open-hearth	B.	B.	b.
Bessemer	C.	C.	c.
Crucible	D.	D.	d.
Electric	E.	E.	e.
Miscellaneous	F.	F.	f.

UNITED STATES.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
ALABAMA.		
Anniston.		
Anniston Steel Co.	not stated	E.
Bessemer.		
National Steel Products Co. . . .	3,000	A.
Birmingham.		
Adams, W. T. (idle; for sale) . .	2,000	B.
Ensley.		
Tennessee Coal, Iron & Railroad Co.	5,000	b.
ALASKA.		
Treadwell.		
Alaska Treadwell Gold Mining Co.	300	e.
ARKANSAS.		
Pine Bluff.		
Standard Brake Shoe & Foundry Co.	3,000	E.
CALIFORNIA.		
Burbank.		
Moreland Motor Truck Co. . . .	3,600	E.
Los Angeles.		
Keystone Iron & Steel Wks. (bldg.)	7,200	E.
Warman Steel Casting Co. . . .	4,000	E.
Mare Island.		
United States Gov., Navy Department, Mare Island Navy Yard. .	3,000	c., e.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Oakland.		
American Mang. Steel Co. (Plant F)	3,000	E.
Best Steel Casting Co.	5,000	C., E.
Pittsburg.		
Columbia Steel Co.	33,000	A., B.
Sacramento.		
Southern Pacific Co.	5,000	e.
South San Francisco.		
Enterprise Foundry Co.	3,000	B., E.
Stockton.		
Monarch Foundry Co.	1,000	E.
Torrance.		
Llewellyn Iron Works	2,500	B., E.
Union Tool Co.	2,500	B., E.

COLORADO.

Denver.		
The Denver Rock Drill Mfg. Co. .	500	E.
Queen City Foundry Co.	3,000	C., E.
Pueblo		
The Colorado Fuel & Iron Co. . .	2,000	b.
The Stearns-Roger Mfg. Co. . . .	450	E.

CONNECTICUT.

Branford.		
Malleable Iron Fittings Co. . . .	10,000	A., C.
Bridgeport.		
The American Tube & Stamping Co.	500	b.
Groton.		
The New London Ship & Engine Co.	200	E.
Hartford.		
The Connecticut Electric Steel Co. .	1,000	E.
Rocky Hill.		
The Hartford Electric Steel Corpn.	3,000	E.

DELAWARE.

New Castle.		
American Manganese Steel Co. :		
Plant B.	3,000	C.
Plant C.	5,000	C., F.
Deemer Steel Casting Co.	3,000	C.
Wilmington.		
Lobdell Car Wheel Co.	6,000	A.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
DISTRICT OF COLUMBIA.		
Washington.		
United States Gov., Navy Department, Naval Gun Factory. . .	14,500	a., c., e.
Washington Steel & Ordnance Co. .	*	b., e.
GEORGIA.		
Atlanta.		
American Machine & Mfg. Co. . .	3,000	A.
Atlantic Steel Co.	*	b.
Marietta.		
Glover Machine Works, Inc. . . .	2,000	E.
ILLINOIS.		
Chicago.		
Burnside Steel Co.	4,800	C.
Chicago Steel Foundry Co. . . .	5,000	C.
Crane Co.	18,000	c., e.
Electric Steel Co.	12,000	E.
Link-Belt Co.	1,200	c.
The National Malleable Castings Co.	40,000	E.
Pettibone Mulliken Co.	4,285	E.
The Standard Steel Castings Co. .	10,000	E.
Chicago Heights.		
American Mang. Steel Co. (Plant A)	10,000	C., F.
East St. Louis.		
American Steel Foundries	50,000	B.
Granite City.		
American Steel Foundries	78,000	B.
Commonwealth Steel Co.	50,000	B.
Hegewisch.		
Western Steel Car & Foundry Co. .	7,500	c., E.
Joilet.		
Illinois Steel Co.	*	c.
Kewanee.		
Walworth Manufacturing Co. . .	800	c.
Melrose Park.		
The National Malleable Castings Co.	40,000	B.
Murphysboro.		
National Car Coupler Co.	12,000	A.
Peoria.		
Avery Company	2,400	e.
Peoria (South Bartonville).		
Keystone Steel & Wire Co. . . .	100	b.

* Steel casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
South Chicago.		
Illinois Steel Co.	6,000	b.
West Harvey.		
Allied Steel Castings Co.	5,300	A., C.
West Pullman.		
McCord & Co.	12,000	E.
INDIANA.		
Attica.		
National Car Coupler Co.	24,000	A.
East Chicago.		
Hubbard Steel Foundry Co.	30,600	A., E.
Evansville.		
Evansville Tool Works.	150	D.
Gary.		
Illinois Steel Co.	15,000	a.
Huntington.		
Huntington Steel Foundry Co.	5,900	C., E.
Indiana Harbor.		
American Steel Foundries	39,600	A., E.
Indianapolis.		
Electric Steel Co. of Indiana	2,500	E.
Lawrenceburg.		
A. D. Cook	50	d.
Montpelier.		
National Steel Casting Co.	6,350	A., D.
South Bend.		
Oliver Chilled Plow Works	3,000	c.
IOWA.		
Bettendorf.		
The Bettendorf Co.	72,000	B.
The Zimmerman Steel Co.	2,400	E.
Centerville.		
Hercules Manufacturing Co.	1,600	C.
Charles City.		
Hart-Parr Co.	11,000	B., C.
Keokuk.		
Fluid Compressed Steel Co.	*	E.
Newton.		
The Parsons Co.	3,000	E.
KENTUCKY.		
Ashland.		
Ashland Steel Co.	*	C.

* Steel casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
LOUISIANA.		
Mansfield.		
DeSoto Foundry & Machine Company, Ltd.	1,500	C.
New Orleans.		
Dibert, Bancroft & Ross Co., Ltd. .	1,500	C.
Shreveport.		
The W. K. Henderson Iron Works & Supply Co., Ltd.	400	e.
MARYLAND.		
Baltimore.		
Baltimore Malleable Iron & Steel Casting Co.	2,000	A.
The Emery Steel Castings Co. . .	4,000	D., E.
MASSACHUSETTS.		
Atlantic.		
Quincy Steel Casting Co., Inc. . .	150	D.
Boston.		
Eastern Steel Casting Co.	600	D.
Hub Electric Steel Casting Co. . .	1,200	E.
Union Steel Casting Co.	12,000	A., C.
United States Government, Navy Dept., Boston Navy Yard . . .	1,250	e., d.
Chelsea.		
Connolly Steel Casting Co. . . .	160	D.
East Longmeadow.		
New England Steel Castings Co. .	1,000	E.
Everett.		
General Electric Co.	16,000	A.
Lynn.		
General Electric Co.	14,000	A., d., E.
Millbury.		
Millbury Steel Foundry Co. . . .	1,000	E.
Neponset.		
The Lundin Steel Casting Co. . .	1,000	A., D.
Pittsfield.		
General Electric Co.	not stated	e.
Watertown.		
United States Government, War Department	58,650	a., c., d., e.
Worcester.		
The American Steel & Wire Co. . .	700	a., b.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
MICHIGAN.		
Bay City.		
Industrial Works	5,000	c.
Union Motor Truck Co. (building)	1,800	E.
Benton Harbor.		
Superior Steel Castings Co. . . .	10,000	A.
Buchanan.		
Clark Equipment Co.	5,000	E.
Calumet.		
Calumet & Hecla Mining Co. . .	not stated	d.
Detroit.		
Buhl Malleable Co.	2,000	A.
John A. Crowley Co.	*	E.
The Detroit Steel Casting Co. . .	15,600	A., C.
Ford Motor Co.	3,000	e.
Michigan Steel Casting Co. . . .	18,000	E.
Monarch Steel Castings Co. . . .	7,000	B.
Swedish Crucible Steel Co. . . .	3,600	C., D.
Kalamazoo.		
Reed Foundry & Machine Co. . .	2,000	c.
Monroe.		
Monroe Steel Casting Co.	2,600	E.
Muskegon.		
West Michigan Steel Foundry Co. .	12,000	C., E.
Saginaw.		
S. Fair & Son, Inc.	3,500	E.
MINNESOTA.		
Duluth.		
McDougall-Duluth Shipbuilding Co.	7,500	A.
Minneapolis.		
Minneapolis Electric Steel Cast. Co.	1,000	E.
Northwestern Steel & Iron Corpn. .	4,200	A.
Transit Supply Co.	not stated	c.
Western Crucible Steel Casting Co.	4,800	E.
St. Paul.		
American Hoist & Derrick Co. . .	2,500	c.
Stillwater.		
Twin City Forge & Foundry Co. .	1,500	E.
MISSOURI.		
Kansas City (Sheffield Station).		
The Kansas City Bolt & Nut Co. (building)	*	b.

* Steel casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
St. Louis.		
St. Louis Frog & Switch Co.	3,500	C.
Scullin Steel Co.	75,000	B.
Warren Steel Casting Co.	6,500	A., E.
NEBRASKA.		
Omaha.		
Omaha Steel Works	6,000	E.
NEW JERSEY.		
Bayonne.		
Bayonne Steel Casting Co.	8,000	A., C.
Chrome.		
Chrome Steel Works	16,500	A., D.
High Bridge.		
Taylor-Wharton Iron & Steel Co.	14,500	C., E.
Kearny.		
Riverside Steel Casting Co.	1,500	A.
Morristown.		
Liberty Steel Co.	not stated	E.
Newark.		
Hewitt Steel Corporation	40,000	A., B.
NEW YORK.		
Buffalo.		
Acme Steel & Malleable Iron Works, Inc.	1,200	E.
American Radiator Co.	21,500	E.
Atlas Steel Casting Co.	15,000	A.
Otis Elevator Co.	2,200	e.
Pratt & Letchworth Co.	20,000	A.
Strong Steel Foundry Co.	7,200	A.
W. P. Taylor Co.	1,800	E.
Worthington Pump & Machinery Corporation.	1,500	c.
Colonie (P. O. Watervliet).		
The Delaware & Hudson Co.	300	c.
Croghan.		
Wayne Steel & Iron Co. (building)	not stated	E.
Depew.		
Gould Coupler Co.	50,000	B.
Lackawanna.		
Lackawanna Steel Co.	1,500	b.
North Tonawanda.		
Niagara Electric Steel Corporation	750	E.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Schenectady.		
General Electric Co.	3,000	e.
Spuyten Duyvil.		
Isaac G. Johnson & Co.	7,500	A., C.
Watervliet.		
Adirondack Steel Foundries Corpn. (building)	not stated	A., E.
Bird Archer Co. (building)	600	e.
OHIO.		
Akron.		
The Acme Steel Co.	1,500	C.
The Adamson Machine Co.	5,000	A.
The Atlantic Foundry Co.	9,000	E.
Alliance.		
American Steel Foundries	72,000	B.
The Machined Steel Casting Co. . .	18,000	A.
Bucyrus.		
The Hadfield-Penfield Steel Co. (formerly American Clay Mchy. Co.)	6,000	c.
The Ohio Steel Foundry Co.	15,000	A.
Canton.		
The Canton Steel Foundry Co. . . .	30,000	A.
The Timken-Detroit Axle Co. . . .	2,500	E.
Cincinnati.		
The Cincinnati Steel Castings Co. .	4,400	C., E.
The Lunkenheimer Co.	6,000	e.
Cleveland.		
The Aetna Steel Castings Co. . . .	2,400	C.
The Cleveland Hardware Co. . . .	40	d.
Cleveland Steel Casting Co.	8,000	A.
The Crucible Steel Casting Co. . . .	1,500	E.
The McKinney Steel Co.	1,700	b.
The National Malleable Castings Company	50,000	E.
The Otis Steel Co.	28,725	A., B., C.
The Standard Steel Castings Co. . .	3,400	C.
The Wellman-Seaver-Morgan Co. . .	10,000	A.
The West Steel Casting Co.	4,800	C., E.
Dayton.		
The Dayton Malleable Iron Co. . . .	2,000	E.
The Dayton Steel Foundry Co. . . .	8,300	C., E.
The Joyce-Cridland Co.	1,100	B.
Findlay.		
The Buckeye Traction Ditcher Co.	600	e.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Lima.		
The Lima Steel Casting Co. . . .	8,800	A., C.
The Ohio Steel Foundry Co. . . .	54,000	A., B.
Lorain.		
The Aetna Steel Castings Co.	2,500	A.
Marion.		
The Commercial Steel Casting Co.	4,000	A.
The Fairbanks Steam Shovel Co. .	1,000	e.
The Marion Steam Shovel Co. . .	9,500	B.
Massillon.		
The Massillon Steel Casting Co. .	3,600	C.
Middletown.		
The American Rolling Mill Co. . .	6,000	B.
Norwood.		
Allis-Chalmers Mfg. Co. (projected)	1,200	E.
Portsmouth.		
Whitaker-Glessner Co.	1,200	b.
Sandusky.		
The Bay View Foundry Co.	1,800	C.
The Farrell-Cheek Steel Foundry Company	1,000	C., E.
South Columbus (Columbus P. O.).		
The Bonney-Floyd Co.	20,000	B., C., E.
The Buckeye Steel Castings Co. . .	100,000	B., E.
Springfield.		
The Ohio Steel Foundry Co.	7,000	E.
Toledo.		
The Industrial Steel Casting Co. .	3,000	E.
The Toledo Steel Casting Co. . . .	3,000	C.
OKLAHOMA.		
Tulsa.		
Oklahoma Iron Works	350	e.
Oklahoma Steel Castings Co. (pjcted.)	5,000	E.
OREGON.		
Portland.		
Columbia Steel Co.	2,500	C.
Electric Steel Foundry	5,000	E.
Pacific Brass & Steel Foundry . .	250	D.
PANAMA, CANAL ZONE.		
Balboa.		
The Panama Canal.	3,600	c.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
PENNSYLVANIA.		
Ambridge.		
American Bridge Co.	8,600	A.
Avonmore.		
The Fahnstock Manufacturing Co.	3,600	A.
Bethlehem.		
Bethlehem Steel Co. (Lehigh Plant).	13,100	B.
Birdsboro.		
Birdsboro Steel Foundry & Machine Company	18,000	A., B.
Brackenridge.		
Allegheny Steel Co.	7,000	A.
West Penn Steel Co.	*	b.
Braddock.		
Sterling Steel Foundry Co. . . .	12,000	A.
Burnham.		
Standard Steel Works Co.	not stated	A., B.
Carlisle.		
The Frog, Switch & Mfg. Co. . .	2,500	C.
Chester.		
American Locomotive Co.	28,800	A.
American Steel Foundries (Thurlow Works)	22,500	A.
Atlantic Steel Castings Co. . . .	4,800	A.
Chester Steel Castings Co. . . .	10,800	A., F.
Federal Steel Foundry Co. . . .	8,000	B.
Penn Seaboard Steel Corporation .	62,000	A.
Coatesville.		
The Lukens Steel Co.	400	a., b.
Connellsville		
Connellsville Foundry, Machine and Steel Casting Co.	12,000	C.
Conshohocken.		
American Metallurgical Corp'n. . .	900	E.
Crum Lynne.		
Eagan-Rogers Steel & Iron Co. . .	2,500	C.
Donora.		
The American Steel & Wire Co. . .	600	b.
Duquesne.		
Carnegie Steel Co.	1,200	b.
Easton.		
Taylor-Wharton Iron & Steel Co. .	10,000	C., E.
Treadwell Engineering Co. . . .	5,000	E.

* Steel casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Erie.		
Erie Forge Co.	60,000	A., B.
General Electric Co.	3,000	e.
National Foundry Co.	7,000	A.
Standard Stoker Co.	3,600	e.
Franklin.		
American Steel Foundries	11,000	A.
Glassport.		
Pittsburgh Steel Foundry Co. . .	60,000	A., B.
Greensburg.		
Hempfield Foundries Co.	800	C.
The Kelly & Jones Co.	1,000	c.
Hamburg.		
Driscoll-Reese Steel Co.	900	E.
Hanover.		
Vulcan Iron Works	12,000	A.
Johnstown.		
Cambria Steel Co.	5,000	a., b.
The Lorain Steel Co.	15,500	A.
Kendall Station (P. O. Coraopolis).		
Duquesne Steel Foundry Co. . . .	25,000	A.
Lansdowne.		
Crucible Steel Casting Co. . . .	5,500	C., E.
Lebanon.		
Lebanon Steel Foundry	4,800	E.
McKeesport.		
Fort Pitt Steel Casting Co. . . .	9,000	C., E.
McKees Rocks.		
Pressed Steel Car Co.	7,200	A.
Midland.		
Pittsburgh Crucible Steel Co. . .	*	a., b.
Pittsburgh Iron & Steel Foundries Co.	8,500	A.
Milton.		
The Milton Mfg. Co. (building). .	4,500	E.
Monaca.		
Beaver Valley Alloy Fdy. Co. (bldg.)	300	D.
Morton.		
Morton Steel Casting Co. (idle) . .	15,000	A.
Munhall.		
Carnegie Steel Co.	2,500	b.
New Brighton.		
Damascus Crucible Steel Casting Co.	1,550	C., E.
New Kensington.		
Union Spring & Manufacturing Co.	15,200	C., E.

* Steel casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Oakmont.		
Edgewater Steel Co.	9,600	A.
Oil City.		
National Transit Pump & M. Co.	1,500	C.
Oil Well Supply Co.	500	e.
Pencoyd.		
American Bridge Co.	3,200	B.
Philadelphia.		
Dodge Steel Co. (Tacony)	2,000	E.
Midvale Steel & Ordnance Co. . .	3,750	B., E.
Taylor-Wharton Iron & Steel Co. .	7,000	A., C.
United States Gov., Navy Dept., Philadelphia Navy Yard	1,865	d., e.
Phoenixville.		
The Phoenix Iron Co.	2,500	B.
Pittsburgh.		
The American Steel & Wire Co. . .	150	b.
American Steel Foundries	7,500	A.
The Electro Steel Co., Inc. . . .	*	E.
Jones & Laughlin Steel Co. . . .	10,000	a.
The McConway & Torley Co. . . .	34,000	A.
Mackintosh, Hemphill & Co. . . .	15,000	A.
Pittsburgh Rolls Corporation . . .	15,000	A.
Pittsburgh Valve, Foundry & Construction Co.	800	E.
Reliance Steel Casting Co.	6,000	A.
Stroh Steel Hardening Process Co. .	4,000	A.
Union Steel Casting Co.	36,000	A.
Reading.		
Reading Iron Co.	2,500	c.
Reading Steel Casting Co.	28,200	A., C.
Scranton.		
Spencer Heater Co.	2,000	E.
Sharon.		
American Steel Foundries	33,000	B.
The National Malleable Castings Co.	60,000	B., E.
Steelton.		
Bethlehem Steel Co.	12,000	B.
Trafford.		
Westinghouse Electric & Mfg. Co.	4,000	e.
Vandergrift.		
United Engineering & Foundry Co.	24,000	A.
Verona.		
Verona Steel Castings Co.	48,000	A., B.

* Steel casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Weatherly.		
Weatherly Steel Castings Co. . . .	3,000	C.
West Homestead (Mesta Station).		
Mesta Machine Co.	25,000	A.
Wheatland.		
Sharon Foundry Co.	10,000	A.

RHODE ISLAND.

Providence.		
Rhode Island Crucible Steel Co. . .	1,200	D.

SOUTH CAROLINA.

Charleston.		
United States Gov., Navy Department, Charleston Navy Yard . .	1,200	c.

TENNESSEE.

Chattanooga.		
Ross-Meehan Foundries	3,000	C.
Lenoir City.		
Lenoir Car Works	3,000	A.

TEXAS.

Beaumont.		
Beaumont Iron Works Co. . . .	750	E.
Corsicana.		
American Well & Prospecting Co. .	200	E.
El Paso.		
El Paso Foundry & Machine Co. .	500	C.

UTAH.

Salt Lake City.		
American Foundry & Machine Co.	2,500	E.
Salt Lake Iron & Steel Co. . . .	3,600	C.

VIRGINIA.

Lynchburg.		
Southern Electro Steel Co., Inc. (bldg.) not stated		E.
Newport News.		
Newport News Shipbuilding & Dry Dock Co.	1,600	c., e.
Portsmouth.		
United States Gov., Navy Department, Norfolk Navy Yard . . .	4,000	c., e.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Roanoke.		
Norfolk & Western Railway Co.	750	e.
WASHINGTON.		
Bremerton.		
United States Gov., Navy Department, Puget Sound Navy Yard	1,500	c., e.
Everett.		
Everett Steel Co.	1,000	E.
Hoquiam.		
Lamb Machine Co.	2,500	E.
Renton.		
Pacific Car & Foundry Co.	1,000	E.
Seattle.		
Aurora Foundry Co.	350	E.
Olympic Steel Works	2,100	E.
Vulcan Manufacturing Co.	1,000	E.
Washington Iron Works	3,000	E.
Western Rolling Mill Corp'n. (projected)	not stated	b., e.
Sedro-Woolley.		
Skagit Steel & Iron Works	1,400	C., E.
Spokane.		
Union Iron Works	1,000	c.
Tacoma.		
Malleable Steel & Iron Co.	1,000	E.
The Puget Sound Iron & Steel Works	6,000	C.
WEST VIRGINIA.		
Benwood.		
National Tube Co.	250	c.
New Cumberland.		
Thomas R. Heyward, Jr.	10,000	A.
South Charleston.		
United States Gov., Navy Department, Ordnance Plant	500	e.
Wheeling.		
Wheeling Mold & Foundry Co.	30,000	A.
Wheeling Steel Cast. Co. (Warwood)	3,600	A.
WISCONSIN.		
Green Bay.		
Helgerson Foundry Co.	1,200	C.
Kenosha.		
Arneson Foundry Co.	3,000	C.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Milwaukee (see also West Allis).		
Crucible Steel Casting Co.	3,000	E.
The Falk Co.	25,000	A.
Hercules Steel Casting Co.	1,500	E.
Kinite Co.	110	E.
Maynard Electric Steel Casting Co.	4,800	E.
Milwaukee Steel Foundry Co. . . .	7,000	C., E.
Modern Steel Casting Co.	1,500	C.
National Steel Foundries	10,000	A.
Pelton Steel Co.	10,000	A., E.
Sivyer Steel Casting Co.	10,000	C. E.
George H. Smith Steel Casting Co.	8,400	A., C.
Standard Crucible Steel Casting Co.	2,500	A.
Racine.		
Racine Steel Castings Co.	3,000	E.
St. Francis.		
General Steel Co.	*	E.
South Milwaukee.		
Bucyrus Co.	7,200	B.
The Stowell Co.	1,200	E.
West Allis (Milwaukee).		
Gerlinger Electric Steel Foundry Co.	9,000	E.
Gerlinger Steel Casting Co.	4,000	E.
Wehr Steel Co.	5,400	C., E.

CANADA.

BRITISH COLUMBIA.

Vancouver.		
Opsal Steel Co., Ltd.	1,200	B.
Vancouver Engineering Works, Ltd.	2,450	C., E.

MANITOBA.

Selkirk.		
Manitoba Steel Foundries, Ltd. . .	6,000	E.

NOVA SCOTIA.

Londonderry.		
The Londonderry I. & M. Co., Ltd.	2,500	B.

ONTARIO.

Ashbridges Bay (Toronto)		
Baldwins Canadian Steel Corp. . .	*	e.

* Steel casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Hamilton.		
Dominion Foundries & Steel, Ltd. .	35,000	A., B., E.
The Steel Co. of Canada, Ltd. . .	*	b.
Orillia.		
Canada Electric Castings Co., Ltd.	750	E.
Owen Sound.		
The William Kennedy & Sons, Ltd.	1,200	C.
Walkersville.		
Hiram Walker & Sons Metal Products, Ltd.	not stated	E.
Welland.		
Canadian Steel Foundries, Ltd. .	12,000	B.
The Electric Steel & Metals Co., Ltd.	*	E.
Windsor.		
The Swed. Cruc. Steel Co. of Can., Ltd.	2,875	C., D.
QUEBEC.		
Hull.		
The Hull Iron & Steel Foundries, Ltd.	6,000	C.
Joliette.		
Joliette Steel Co., Ltd.	2,000	C.
Longue Pointe (Montreal)		
Canadian Steel Foundries, Ltd. . .	43,000	A., B.
Longueuil.		
Armstrong, Whitworth of Can., Ltd.	*	B., D., E.
Montmagny.		
The National Farming Machinery, Ltd.	26,800	A., C.
Montreal.		
The Thos. Davidson Mfg. Co., Ltd.	15,000	E.
Point St. Charles (Montreal)		
Canadian Steel Foundries, Ltd. . .	3,000	C.
Quebec.		
La Compagnie F. X. Drolet . . .	2,000	C.
Rawdon.		
Anglo-Can. Mall. Steel Mfg. Co., Ltd.	220	D.
Sherbrooke.		
Canadian Brakeshoe Co., Ltd. . .	2,000	E.
Sorel.		
Beauchemin et Fils, Ltd.	1,500	C.
Three Rivers.		
La Fonderie d'Acier des Trois Rivieres, Ltd. (idle)	4,000	A.
St. Maurice Foundries, Ltd. . . .	2,000	C.

* Steel casting capacity not stated. See list of steel ingot plants.

LIST OF ROLLING MILLS IN THE UNITED STATES
AND CANADA.

UNITED STATES.

ALABAMA.

Alabama City.

Gulf States Steel Co.

Anniston.

Kilby Car & Foundry Co.

Bessemer.

Tennessee Coal, Iron & R. R. Co.

Birmingham (Woodlawn).

Connors Steel Co., Inc.

East Birmingham.

Gerson Rolling Mill.

Ensley.

Tennessee Coal, Iron & R. R. Co.

Fairfield.

The American Steel & Wire Co.

Tennessee Coal, Iron & R. R. Co.

Helena.

Connors-Weyman Steel Co.

CALIFORNIA.

Huntington Park.

Southern California Iron & Steel Co. (building).

Los Angeles.

Southern California Iron & Steel Co.

Oakland (Emeryville).

Judson Manufacturing Co.

Pittsburg.

Columbia Steel Co. (see Addenda).

Sacramento.

Southern Pacific Co.

San Francisco.

Simmons Co.

South San Francisco.

Pacific Coast Steel Co.

Torrance.

Llewellyn Iron Works.

COLORADO.

Pueblo.

The Colorado Fuel & Iron Co. (Minnequa Works).

CONNECTICUT.

Bridgeport.

The American Tube & Stamping Co.

Collinsville.

The Collins Co.

New Britain.

The Stanley Works.

Southington.

The Aetna Nut Co.

DELAWARE.

Claymont.

Worth Steel Co.

New Castle.

Penn Seaboard Steel Corporation.

Wilmington.

McCullough Iron Co.

Midvale Steel & Ordnance Co.

GEORGIA.

Atlanta.

Atlantic Steel Co.

Macon.

Central of Georgia Ry. Co.

ILLINOIS.

Alton.

Laclede Steel Co.

Chicago.

Chicago Electric Steel Co.

The Highland Iron & Steel Co. (West Pullman Works).

International Harvester Co. (Deering Works).

Interstate Iron & Steel Co. (Grand Crossing Works).

Sellers Manufacturing Co. (Mayfair).

Chicago Heights.

Calumet Steel Co.

Columbia Tool Steel Co.

Inland Steel Co.

Railway Steel-Spring Co. (Inter-Ocean Plant).

Granite City.

National Enameling & Stamping Co.

Joliet.

American McKenna Process Co.

Frederick Cowin & Co., Inc.

Illinois Steel Co.

Phoenix Horse Shoe Co.

Madison.

American Car & Foundry Co.

Laclede Steel Co.

Moline.

Republic Iron & Steel Co. (Sylvan Works).

Peoria (South Bartonville).

Keystone Steel & Wire Co.

Pullman.

The Pullman Co.

Riverdale.

Acme Steel Goods Co.

Riverdale Rolling Mill Co.

South Chicago.

Illinois Steel Co. (South Works).

International Harvester Co. (Wisconsin Steel Works).

Interstate Iron & Steel Co. (118th St. Steel Works).

Waukegan.

The American Steel & Wire Co.

INDIANA.

Aetna.

Aetna Iron & Steel Corpn. (projected).

Anderson.

The American Steel & Wire Co.

East Chicago.

Interstate Iron & Steel Co.

Republic Iron & Steel Co. (Inland Works).

Elwood.

American Sheet & Tin Plate Co. (American Works).

Ames Shovel & Tool Co.

Fort Wayne.

The Fort Wayne Rolling Mill Corporation.

Gary.

American Sheet & Tin Plate Co.:

Gary Sheet Mill.

Gary Tin Mill.

Illinois Steel Co. (Gary Works).

Indiana Harbor.

Inland Steel Co.

The Steel & Tube Co. of America (Mark Works).

Indianapolis.

Chapman Price Steel Co. (projected; see Addenda).

Kokomo.

Kokomo Steel & Wire Co.

Lawrenceburg.

A. D. Cook.

New Albany.

Ohio Falls Iron Co.

New Castle.

Indiana Rolling Mill Co.

Noblesville.

New Process Iron & Steel Co. (projected; see Addenda).
Terre Haute.

The Highland Iron & Steel Co.

Hoosier Rolling Mill Co.

Vincennes.

National Rolling Mill Co.

IOWA.

Fort Dodge.

Fort Dodge Culvert and Iron Mills Co.

KANSAS.

Kansas City.

American McKenna Process Co.

Pittsburg.

The Kansas City Southern Railway Co. (idle).

KENTUCKY.

Ashland.

Ashland Iron & Mining Co.:

Steel Plant.

Ashland Sheet Mill.

Ashland Steel Co.

Norton Iron Works.

Louisville.

Ewald Iron Co.

Kentucky Iron & Steel Co., Inc. (see Addenda).

Newport.

The Andrews Steel Co.

Newport Rolling Mill Co.

MAINE.

South Portland.

Bancroft & Martin Rolling Mills Co.

MARYLAND.

Baltimore.

Baltimore & Ohio R. R. Co. (Mount Clare).

Eastern Rolling Mill Co. (see Addenda).

The Hess Steel Corporation.

The National Steel Rolling Co. (projected; see Addenda).

Cumberland.

N. & G. Taylor Co., Inc.

United States Rail Co.

Sparrows Point.

Bethlehem Steel Co.

MASSACHUSETTS.

Bridgewater.

The Stanley Works.

Danvers.

Massachusetts Iron & Steel Co. (see Addenda).

South Wareham.

Standard Horseshoe Co.

West Wareham.

Tremont Nail Co.

Worcester.

The American Steel & Wire Co. (South Works).

Coes Wrench Co.

Worcester Pressed Steel Co. (makes cold rolled products; hot mills building).

MICHIGAN.**Detroit.**

American Car & Foundry Co.

Detroit Seamless Steel Tubes Co. (2 works; see Addenda).

Railway Steel-Spring Co.

Kalamazoo.

Harrow Spring Co.

MINNESOTA.**Duluth (Morgan Park).**

Minnesota Steel Co.

St. Cloud.

Great Northern R. R.

MISSOURI.**Kansas City.**

Black Steel & Wire Co.

The Kansas City Bolt & Nut Co. (Sheffield Station).

St. Louis.

American Car & Foundry Co.

Hirsch Rolling Mill Co.

National Enameling & Stamping Co. (Granite Rolling Mill Branch).

St. Louis Screw Co.

Scullin Steel Co. (building).

NEW JERSEY.**Chrome.**

Chrome Steel Works.

Dover.

Ulster Iron Works.

Elizabethport.

Singer Manufacturing Co.

Harrison.

Crucible Steel Co. of America (Atha Works).

Jersey City.

W. Ames & Co.

Crucible Steel Co. of America (Spaulding-Jennings Works).

Newark.

Heller Brothers Co.

Perth Amboy.

The C. Pardee Works, Inc.

Phillipsburg.

American Horse Shoe Co.

Riverside.

The National Lock Washer Co.

Rockaway.

International High Speed Steel Co.

Rockaway Rolling Mills Corp.

Roebing.

John A. Roebing's Sons Co. (Kinkora Works).

Tremley Point.

American McKenna Process Co.

Trenton.

John A. Roebing's Sons Co. (Upper Works).

NEW YORK.

Auburn.

Crucible Steel Co. of America (Cayuga Works).

Charles W. Tuttle (Auburn Iron Works).

Blasdell.

Seneca Iron & Steel Co.

Brooklyn.

F. W. Wurster & Co., Inc.

Buffalo.

Donner Steel Co., Inc.

Wickwire Spencer Steel Corp. (see Addenda).

Cohoes.

Cohoes Rolling Mill Co.

Cortland.

Wickwire Brothers.

Dunkirk.

Atlas Crucible Steel Co.

East Buffalo.

New York Central Railroad.

East Syracuse.

Onondaga Steel Co.

Fulton.

Ontario Electric Steel Co.

Lackawanna.

Lackawanna Steel Co.

Lockport.

Simonds Manufacturing Co.

Westerman & Co.

New York City.

M. J. Dempsey (Standard Rolling Mill); long idle.

North Tonawanda.

Buffalo Bolt Co.

Poughkeepsie.

Phoenix Horse Shoe Co.

Rome.

Rome Iron Mills, Inc.

Syracuse.

Crucible Steel Co. of America (Sanderson Works).

Eckels-Nye Steel Co.

Halcomb Steel Co.

The Hammond Steel Co., Inc. (Solvay).

Syracuse Alloy Steel Co. (one completed and one building).

Tonawanda.

Buffalo Steel Co.

Troy.

The Burden Iron Co.

The Rail Joint Co.

Watervliet.

Ludlum Steel Co.

NORTH CAROLINA.

South Rocky Mount.

Atlantic Coast Line R. R. Co.

OHIO.

Ashtabula.

The Ashtabula Steel Co. (building; see Addenda).

Bellaire.

Carnegie Steel Co.

Bridgeport.

American Sheet & Tin Plate Co. (Ætna-Standard Works).

Cambridge.

American Sheet & Tin Plate Co.:

Cambridge Works.

Guernsey Works.

The Cambridge Steel Co. (building; see Addenda).

Canton.

The Berger Manufacturing Co.

The Canton Sheet Steel Co.

The Carnahan Tin Plate & Sheet Co.

The Superior Sheet Steel Co. (building; see Addenda).

The Timken Roller Bearing Co.

United Alloy Steel Corporation.

Cleveland.

American Sheet & Tin Plate Co. (Crescent Works).

The American Steel & Wire Co.:

American Works.

Consolidated Works.

Cuyahoga Works.

H. P. Works.

Newburgh Steel Works.

Cleveland—(Continued)

The Cleveland Hardware Co.
The Cleveland Steel Co.
Electric Steel & Forge Co. (building).
The Empire Rolling Mill Co.
The Lake Erie Bolt & Nut Co.
The McKinney Steel Co.
The Otis Steel Co.:
 Lakeside Works.
 Riverside Works.
 Sheet Mill Plant (building).
The Union Rolling Mill Co.
The Upson Nut Co.

Clevcs.

The Cincinnati Horse Shoe & Iron Co.

Columbia Heights (near Massillon).

The Central Steel Co.

Columbus.

Carnegie Steel Co.

Cuyahoga Falls.

Falls Hollow Staybolt Co.

Dover.

American Sheet & Tin Plate Co.
Reeves Manufacturing Co.

Elyria.

The Elyria Iron & Steel Co.

Girard.

A. M. Byers Co.

Ironton.

The Kelly Nail & Iron Co.

Lorain.

American Steel & Tube Co.
The Cromwell Steel Co.
The National Tube Co.

Lowellville.

Sharon Steel Hoop Co.

McDonald.

Carnegie Steel Co.

Mansfield.

Mansfield Sheet & Tinplate Co. (see Addenda).

Marietta.

Hudson Sheet & Tinplate Co.
Pittsburgh Tin Plate & Steel Corporation.

Marion.

The Pollak Steel Co.

Martins Ferry.

American Sheet & Tin Plate Co. (Laughlin Works).
Whitaker-Glessner Co.

Massillon.

- The Massillon Rolling Mill Co.
- The National Pressed Steel Co.
- The Peerless Drawn Steel Co. (building).

Middletown.

- The American Rolling Mill Co.:
- Central Works.
- East Side Works.

Mingo Junction.

- Carnegie Steel Co.:
- Mingo Steel Works.

Newark.

- The Buckeye Rolling Mill Co.

New Philadelphia.

- American Sheet & Tin Plate Co.

Newton Falls.

- The Newton Steel Co.

-Niles.

- The Brier Hill Steel Co.:
- Empire Works.
- Thomas Works.
- The Falcon Steel Co.
- The Mahoning Valley Steel Co.
- Republic Iron & Steel Co.:
- Niles Works.

Norwalk.

- Crucible Steel Co. of America.

Portsmouth.

- Whitaker-Glessner Co.

Shelby.

- The Ohio Seamless Tube Co.

Steubenville.

- La Belle Iron Works.
- Weirton Steel Co.

Toronto.

- Follansbee Brothers Co. (building).

Warren.

- The Brier Hill Steel Co.:
- Western Reserve Works.
- The Trumbull Steel Co.:
- Main Works.
- Liberty Works.
- The Warren Iron & Steel Co.

Wellsville.

- American Sheet & Tin Plate Co.

Yorkville.

- Wheeling Steel & Iron Co.

Youngstown.

The Brier Hill Steel Co.:

Open Hearth Steel Works.

Plate Mill.

Carnegie Steel Co.:

Ohio Steel Works.

Upper Union Mills.

Lower Union Mills.

Republic Iron & Steel Co.:

Open Hearth Steel Works.

Bessemer Steel Works.

Brown-Bonnell Works.

Sharon Steel Hoop Co.

The Youngstown Sheet & Tube Co.

Zanesville.

The American Rolling Mill Co.

OKLAHOMA.

Arkoma.

Fort Smith Iron & Steel Mills.

Sand Springs.

G. W. Armstrong & Co., Inc.

PANAMA, CANAL ZONE.

Balboa.

The Panama Canal.

PENNSYLVANIA.

Aliquippa.

The Russell Shovel Co.

Vulcan Crucible Steel Co.

Allenport.

Pittsburgh Steel Products Co.

Allentown.

The American Steel & Wire Co.

Altoona.

The Altoona Iron Co.

Apollo.

Apollo Steel Co.

Auburn.

Delaware Seamless Tube Co.

Beaver Falls.

Ames Shovel & Tool Co. (H. M. Myers Co. Plant).

Berwick.

American Car & Foundry Co.

Bethlehem.

Bethlehem Steel Co.

Lehigh Plant.

Saucon Plant.

Birdsboro.

Reading Iron Co. (Birdsboro Dept.)

Blandon.

Blandon Rolling Mill, Inc.

Brackenridge.

Allegheny Steel Co.

West Penn Steel Co.

Braddock.

The American Steel & Wire Co.

Braeburn.

Braeburn Steel Co.

Bridgeville.

Universal Steel Co.

Burnham.

Logan Iron & Steel Co.

Standard Steel Works Co.

Butler.

Forged Steel Wheel Co.

Canonsburg.

Canonsburg Steel & Iron Works.

The Standard Tin Plate Co.

Carnegie.

Superior Steel Corporation.

Catasauqua.

Manufacturers Iron & Steel Co.

Charleroi.

The Electric Alloy Steel Co. (see Addenda):

Charleroi Works.

Clairton.

Carnegie Steel Co.

Coatesville.

The Lukens Steel Co.

Midvale Steel & Ordnance Co.:

Brandywine Works.

Viaduct Works.

Colona.

Colonial Steel Co.

Columbia.

Edwards, E. T.:

East End Mill.

Union Street Mill.

Reading Iron Co.:

Columbia Mill.

Susquehanna Mill.

Janson Steel & Iron Co.

Connellsville.

Sligo Iron & Steel Co.

Conshohocken.

Alan Wood Iron & Steel Co.:
Schuylkill Iron Works.
J. Wood Dept.

Corry.

McInnes Steel Co., Ltd.

Creighton.

Penn Iron & Steel Co.

Crum Lynne.

Eddystone Steel Co.

Curtin.

Curtin Forge Co.

Danville.

American-Swedo Iron Co.
Danville Structural Tubing Co.
Pennsylvania Brake Beam Co.
Reading Iron Co.:
Danville Puddle Dept.
Montour Rolling Mills Dept.

Donora.

The American Steel & Wire Co.

Duncannon.

Lebanon Valley Iron & Steel Co.:
Duncannon Iron Works.

Duquesne.

Carnegie Steel Co.

Economy.

Standard Seamless Tube Co.

Eddystone.

The Baldwin Locomotive Works.

Ellwood City.

National Tube Co.

Erie.

United States Horse Shoe Co.
Wayne Steel Co. (see Addenda).

Etna.

Spang, Chalfant & Co.

Farrell.

American Sheet & Tin Plate Co.:
Farrell Works.
Mercer Works.
The American Steel & Wire Co.
Carnegie Steel Co.

Fort Washington.

Hoopes & Townsend Co.

Franklin.

Franklin Steel Works.

- Glassport.
 - Pittsburgh Steel Co.
- Greenville.
 - Carnegie Steel Co.
- Harrisburg.
 - Capital City Iron & Steel Co.
 - Central Iron and Steel Co.:
 - Central Iron Works.
 - Paxton Rolling Mills.
 - Harrisburg Pipe & Pipe Bending Co.
 - Lalanc & Grosjean Manufacturing Co.
- Hays Station (Allegheny County).
 - Eichleay, J. P. & W. B. (see Addenda).
- Hyde.
 - Nickel-Alloys Co.
- Hyde Park.
 - American Sheet & Tin Plate Co.
- Ivy Rock.
 - Alan Wood Iron & Steel Co.
- Johnstown.
 - Cambria Steel Co.:
 - Cambria Plant. Wire Mills.
 - Franklin Plant. Wheel Plant.
 - Gautier Plant.
- Kittanning.
 - Kittanning Iron & Steel Manufacturing Co.
- Lancaster.
 - Penn Steel & Iron Corporation.
- Latrobe.
 - Latrobe Electric Steel Co.
 - Railway Steel-Spring Co.
 - Vanadium Alloys Steel Co.
- Lebanon.
 - Bethlehem Steel Co. (American Iron & Steel Works).
 - Lebanon Valley Iron & Steel Co.
- Leechburg.
 - American Sheet & Tin Plate Co.
- McKeesport.
 - American Sheet & Tin Plate Co. (Wood Works).
 - Firth-Sterling Steel Co. (Demmler Station).
 - National Tube Co. (National Works).
- McKees Rocks.
 - Carnegie Steel Co.:
 - Schoen Steel Wheel Works.
 - Lockhart Iron & Steel Co.
- Midland.
 - Pittsburgh Crucible Steel Co.

Milton.

East End Puddle Mill.

The Milton Manufacturing Co. (see Addenda).

-Monessen.

American Sheet & Tin Plate Co. (National Works).

Carnegie Steel Co.

Page Steel & Wire Co.

Pittsburgh Steel Co.

Pittsburgh Steel Products Co.

Monongahela.

Le Moyne Steel Co.

Morado Station.

Pittsburgh Seamless Tube Co.

Munhall.

Carnegie Steel Co. (Homestead Steel Works).

Neville Island.

Witherow Steel Co.

New Castle.

American Sheet & Tin Plate Co.:

New Castle Works.

Shenango Works.

Carnegie Steel Co.

New Kensington.

American Sheet & Tin Plate Co.:

Pennsylvania Works.

Pittsburgh Works.

North Braddock.

Carnegie Steel Co. (Edgar Thomson Steel Works).

Northumberland.

Van Alen & Co. (Northumberland Iron & Nail Works).

Oakmont.

Edgewater Steel Co.

Parkesburg.

Parkesburg Iron Co.

Pencoyd.

American Bridge Co.

Philadelphia.

Davis Bros. Rolling Mill & Spike Works.

Henry Disston & Sons Iron & Steel Works (Tacony).

Hughes & Patterson.

The John Illinworth Steel Co. (Frankford).

Ivins' (Ellwood) Tube Works (Oak Lane Station).

Midvale Steel & Ordnance Co. (Nicetown Works).

Nicetown Plate Washer Co., Inc. (Nicetown).

Tacony Steel Co. (Tacony).

Phoenixville.

The Phoenix Iron Co.

Pine Forge.

Pine Iron Works Co.

Pittsburgh.

The American Steel & Wire Co. (Shoenberger Works).

Brown & Co., Inc.

A. M. Byers Co.

Carbon Steel Co.

Carnegie Steel Co.:

Clark Mills.

McCutcheon Mills.

Painter Mills.

Upper Union Mills.

Lower Union Mills.

Crucible Steel Co. of America:

Black Diamond Works.

Crescent Works.

La Belle Works (North Side).

Singer-Nimick Works.

Dilworth, Porter & Co., Inc.

Jones & Laughlin Steel Co.:

Pittsburgh Works.

National Tube Co.:

Continental Works.

National Works, Republic Dept.

Oliver Iron & Steel Co.

Pittsburgh Forge & Iron Co. (North Side).

Port Vue.

McKeesport Tin Plate Co.

Pottstown.

Glasgow Iron Co.:

Glasgow Iron & Steel Works.

Pottstown Iron Works.

Nagle Steel Co.:

Glasgow Works.

Pottstown Works.

Reading Iron Co. (Pottstown Dept.).

Pottsville.

The Eastern Steel Co.

Punxsutawney.

Danville Iron & Steel Co. (idle).

Rankin.

The American Steel & Wire Co.

Copper Clad Steel Co.

Reading.

Bethlehem Steel Co.

American Iron & Steel Works.

The Carpenter Steel Co.

Reading—(Continued)

Reading Iron Co.:

Ninth Street Mills Dept.

Oley Street Mills Dept.

Sheet Mill Dept.

Schuylkill Haven.

The National Steel Rolling Co. (see Addenda).

Scottdale.

American Sheet & Tin Plate Co.:

Old Meadow Works.

Scottdale Works.

Scranton.

The Delaware, Lackawanna & Western R. R. Co.

Scranton Bolt & Nut Co.

Seyfert Station.

Nagle Steel Co. (Seyfert Works).

Sharon.

Carnegie Steel Co.

Sharon Steel Hoop Co.

Wilkes Rolling Mill Co.

Sharpsburg.

Moorhead, Brother & Co., Inc. (Vesuvius Iron & Nail Works).

Slatington.

Slatington Iron & Steel Co.

Steelton.

Bethlehem Steel Co.

Titusville.

Cyclops Steel Co., Inc.

Vandergrift.

American Sheet & Tin Plate Co.

Washington.

Griffiths Charcoal Iron Mills.

Jessop Steel Co.

The Tyler Tube & Pipe Co.

Washington Tinplate Co.

Waynesburg.

American Steel Co.

West Homestead.

Carnegie Steel Co. (Howard Axle Works).

West Leechburg.

West Leechburg Steel Co.

Williamsport (Newberry).

Sweet's Steel Co.

Woodlawn.

Jones & Laughlin Steel Co. (Aliquippa Works).

Wyoming.

The Wyoming Shovel Works.

RHODE ISLAND.

Pawtucket.

Champion Horse Shoe Co.

Phillipsdale.

American Electrical Works.

Washburn Wire Co.

TENNESSEE.

Knoxville (Lonsdale).

Knoxville Iron Co.

TEXAS.

Fort Worth.

G. W. Armstrong & Co., Inc.

UTAH.

Midvale.

Utah Steel Corporation.

VIRGINIA.

Richmond.

Old Dominion Iron & Steel Corporation.

The Tredegar Co.

WASHINGTON.

Lowell.

United Steel Co. (building).

Seattle.

Western Rolling Mill Corporation (projected).

Youngstown.

Pacific Coast Steel Co. (Seattle Works).

WEST VIRGINIA.

Beach Bottom.

Whitaker-Glessner Co.

Benwood.

National Tube Co. (Riverside Works).

Wheeling Steel & Iron Co.:

Wheeling Steel Works.

Benwood Skelp Mill.

Charleston.

Becker Steel Co. of America, Inc.

Chester.

American Sheet & Tin Plate Co.

Clarksburg.

Weirton Steel Co.

Follansbee.

Follansbee Brothers Co.

Huntington.

The West Virginia Rail Co.

Morgantown.

American Sheet & Tin Plate Co. (Sabraton Works).

Paden City.

Monongahela Iron & Steel Co.

Parkersburg.

Parkersburg Iron & Steel Co.

Weirton.

Weirton Steel Co.:

Weirton Plant:

Steel Dept. (building).

Tinplate Dept.

Strip Steel Dept.

Wheeling.

American Sheet & Tin Plate Co. (La Belle Works).

La Belle Iron Works.

Wheeling Steel & Iron Co. (Belmont Mill).

Whitaker-Glessner Co. (Whitaker Works).

WISCONSIN.**Kenosha.**

Simmons Co.

Milwaukee.

Globe Seamless Steel Tubes Co.

Illinois Steel Co.

Milwaukee Rolling Mill Co. (building).

Wrought Washer Mfg. Co.

St. Francis.

General Steel Co.

CANADA.**ALBERTA.****Medicine Hat.**

Canadian Western Steel Corporation, Ltd.

Redcliff.

Canadian Western Steel Corporation, Ltd.

BRITISH COLUMBIA.**Eburne.**

Vancouver Rolling Mills Co., Ltd.

Port Moody.

Hyatt Steel Products, Ltd. (W. E. Hodges, assignee).

MANITOBA.**Selkirk.**

Manitoba Rolling Mill Co., Ltd.

NEW BRUNSWICK.

St. John.

The Portland Rolling Mills, Ltd.

NOVA SCOTIA.

Amherst.

Canadian Car & Foundry Co., Ltd.

Dartmouth.

The Starr Manufacturing Co., Ltd.

New Glasgow.

Nova Scotia Steel & Coal Co., Ltd.

Sydney.

Dominion Iron & Steel Co., Ltd.

ONTARIO.

Ashbridges Bay (Toronto).

Baldwins Canadian Steel Corporation (projected).

Belleville.

The Steel Co. of Canada, Ltd.

Collingwood.

Canadian Western Steel Corporation, Ltd. (said to have been sold
to M. J. Shaw, Toronto).

Gananoque.

The D. F. Jones Manufacturing Co., Ltd.

Hamilton.

Burlington Steel Co., Ltd.

Canadian Horse Shoe Co., Ltd. (idle).

Dominion Foundries & Steel, Ltd.

The Steel Co. of Canada, Ltd.:

Hamilton Works.

Ontario Works.

London.

London Rolling Mill Co., Ltd.

Sault Ste. Marie.

Algoma Steel Corporation.

Welland.

Canadian Steel Foundries, Ltd.

Dillon Crucible Alloys, Ltd.

QUEBEC.

Longueuil.

Armstrong, Whitworth of Canada, Ltd.

Montmagny.

The National Farming Machinery, Ltd., (building).

Montreal.

Canadian Rolling Mills, Ltd. (Lachine Canal).

Grand Trunk Railway System (Point St. Charles).

Peck Rolling Mills, Ltd. (Lachine Canal).

The Steel Co. of Canada, Ltd.:

Notre Dame Works.

St. Patrick Works.

MANUFACTURERS OF ROLLED STEEL BILLETS.

(F=REPORT FORGING BILLETS ALSO).

Alan Wood Iron & Steel Co., Philadelphia, Pa. (F.)
 Algoma Steel Corporation, Sault Ste. Marie, Ont., Canada. (F.)
 American Rolling Mill Co. (The), Middletown, Ohio. (F.)
 American Steel & Wire Co. (The), Cleveland, Ohio. (F.)
 American Tube & Stamping Co., Bridgeport, Conn.
 Andrews Steel Co. (The), Newport, Ky. (F.)
 Ashland Iron & Mining Co., Ashland, Ky.
 Ashland Steel Co., Ashland, Ky.
 Atlantic Steel Co., Atlanta, Ga.
 Bethlehem Steel Co., Bethlehem, Pa. (F.)
 Black Steel & Wire Co., Kansas City, Mo.
 Braeburn Steel Co., Braeburn, Pa. (own use).
 Brier Hill Steel Co. (The), Youngstown, Ohio.
 Cambria Steel Co., Philadelphia, Pa. (F.)
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada. (F.)
 Canton Sheet Steel Co. (The), Canton, Ohio.
 Capital City I. & S. Co., Harrisburg, Pa. (building; rerolling billets).
 Carbon Steel Co., Pittsburgh, Pa. (F.)
 Carnegie Steel Co., Pittsburgh, Pa. (F.)
 Central Steel Co. (The), Massillon, Ohio. (F.)
 Colonial Steel Co., Pittsburgh, Pa. (F.)
 Colorado Fuel & Iron Co. (The), Denver, Col. (F.)
 Cromwell Steel Co. (The), Cleveland, Ohio.
 Crucible Steel Co. of America, Pittsburgh, Pa. (F.)
 Dominion Foundries and Steel, Ltd., Hamilton, Ont., Canada. (F.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (F.)
 Donner Steel Co., Inc., Buffalo, N. Y. (F.)
 Eastern Steel Co. (The), Pottsville, Pa. (own use).
 Eddystone Steel Co., Crum Lynne, Pa. (F.)
 Forged Steel Wheel Co., Pittsburgh, Pa. (F.; own use.)
 General Steel Co., Milwaukee, Wis. (building).
 Gulf States Steel Co., Birmingham, Ala.
 Halcomb Steel Co., Syracuse, N. Y. (F.)
 Hammond Steel Co., Inc. (The), Syracuse, N. Y.
 Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa. (F.)
 Harrow Spring Co., Kalamazoo, Mich. (F.)
 Hess Steel Corporation (The), Baltimore, Md. (F.)
 Illinois Steel Co., Chicago, Ill. (F.)
 Inland Steel Co., Chicago, Ill. (F.)
 International Harvester Co., Chicago, Ill.
 Interstate Iron & Steel Co., Chicago, Ill.
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (F.)
 Judson Manufacturing Co. (The), San Francisco, Cal.

- Keystone Steel & Wire Co., South Bartonville, Peoria, Ill.
Kokomo Steel & Wire Co., Kokomo, Ind. (F.)
La Belle Iron Works, Steubenville, Ohio. (F.)
Lackawanna Steel Co., Lackawanna, N. Y. (F.)
Laclede Steel Co., St. Louis, Mo. (F.)
Llewellyn Iron Works, Los Angeles, Cal.
Lukens Steel Co. (The), Coatesville, Pa. (F.; forging blanks).
McKinney Steel Co. (The), Cleveland, Ohio.
Midvale Steel & Ordnance Co., New York, N. Y. (F.)
Minnesota Steel Co., Duluth, Minn. (F.)
National Enameling & Stamping Co., New York, N. Y.
National Tube Co., Pittsburgh, Pa. (F.)
National Tube Co. (The), Lorain, Ohio. (F.)
Nova Scotia Steel & Coal Co., Ltd., New Glasgow, Nova Scotia,
Canada. (F.)
Old Dominion Iron & Steel Corp., Belle Isle, Richmond, Va.
Otis Steel Co. (The), Cleveland, Ohio.
Pacific Coast Steel Co., San Francisco, Cal.
Page Steel & Wire Co., Pittsburgh, Pa. (own use).
Pardee (The C.) Works, Inc., Perth Amboy, N. J. (F.)
Penn Seaboard Steel Corp., Philadelphia, Pa. (see Addenda).
Pittsburgh Crucible Steel Co., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, Ohio.
Roebbling's (John A.) Sons Co., Trenton, N. J. (own use).
Sharon Steel Hoop Co., Sharon, Pa.
Southern California Iron & Steel Co., Los Angeles, Cal.
Standard Seamless Tube Co., Pittsburgh, Pa.
Stanley Works (The), New Britain, Conn. (own use).
Steel & Tube Co. of America, Chicago, Ill. (F.)
Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada. (F.)
Taylor (N. & G.) Co., Inc., Philadelphia, Pa. (F.)
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (F.)
Timken Roller Bearing Co. (The), Canton, Ohio. (F.)
Tremont Nail Co., West Wareham, Mass.
United Alloy Steel Corporation, Canton, Ohio. (F.)
United States Horse Shoe Co., Erie, Pa. (own use).
Utah Steel Corporation, Salt Lake City, Utah.
Upson Nut Co. (The), Cleveland, Ohio. (F.)
Washburn Wire Co., Phillipsdale, R. I.
Wayne Steel Co., Erie, Pa. (special billet making machinery).
Weirton Steel Co., Weirton, W. Va. (building).
Wheeling Steel & Iron Co., Wheeling, W. Va.,
Whitaker-Glessner Co., Wheeling, W. Va. (F.)
Wickwire Brothers, Cortland, N. Y. (own use).
Wickwire Spencer Steel Corp., Worcester, Mass. (see Addenda).
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF SHEET BARS AND TINPLATE BARS.

Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co. (The), Middletown, Ohio.
American Sheet & Tin Plate Co., Pittsburgh, Pa. (own use).
American Steel & Tube Co., Lorain, Ohio.
Andrews Steel Co. (The), Newport, Ky.
Ashland Steel Co., Ashland, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Brier Hill Steel Co. (The), Youngstown, Ohio.
Cambria Steel Co., Philadelphia, Pa.
Canton Sheet Steel Co. (The), Canton, Ohio.
Carnegie Steel Co., Pittsburgh, Pa.
Central Steel Co. (The), Massillon, Ohio.
Cromwell Steel Co. (The), Cleveland, Ohio. (forging bars).
Follansbee Brothers Co., Pittsburgh, Pa.
Griffiths Charcoal Iron Mills, Washington, Pa. (own use).
Illinois Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
La Belle Iron Works, Steubenville, Ohio.
Lackawanna Steel Co., Lackawanna, N. Y.
McKinney Steel Co. (The), Cleveland, Ohio.
Mansfield Sheet & Tinplate Co., Mansfield, Ohio.
Midvale Steel & Ordnance Co., New York, N. Y.
Minnesota Steel Co., Duluth, Minn.
National Enameling & Stamping Co., New York, N. Y. (own use).
Parkersburg Iron & Steel Co., Parkersburg, W. Va. (own use).
Reeves Manufacturing Co., Dover, Ohio. (own use).
Republic Iron & Steel Co., Youngstown, Ohio.
Sharon Steel Hoop Co., Sharon, Pa.
Steel Company of Canada, Ltd. (The), Hamilton, Ont., Canada.
Taylor (N. & G.) Co., Inc., Philadelphia, Pa.
Trumbull Steel Co. (The), Warren, Ohio.
United Alloy Steel Corporation, Canton, Ohio.
Weirton Steel Co., Weirton, W. Va. (building).
West Penn Steel Co., Brackenridge, Pa.
Wheeling Steel & Iron Co., Wheeling, West Va.
Whitaker-Glessner Co., Wheeling, West Va.
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF RAILS.

(H=HEAVY RAILS. L=LIGHT RAILS. G=GIRDER RAILS. R=RE-ROLLED RAILS).

Algoma Steel Corporation, Sault Ste. Marie, Ont., Canada. (H., L.)
American McKenna Process Co., Milwaukee, Wis. (R.)
Bethlehem Steel Co., Bethlehem, Pa. (H., L., G.)
Buckeye Rolling Mill Co. (The), Steubenville, Ohio. (R.)

Cambria Steel Co., Philadelphia, Pa. (H., L.)
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada. (L.)
 Carnegie Steel Co., Pittsburgh, Pa. (H., L.)
 Colorado Fuel & Iron Co. (The), Denver, Col. (H., L.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (H.)
 Donner Steel Co., Inc., Buffalo, N. Y. (L.)
 Hirsch Rolling Mill Co., St. Louis, Mo. (L.)
 Hoosier Rolling Mill Co., Terre Haute, Ind. (L.)
 Illinois Steel Co., Chicago, Ill. (H., L.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (L.)
 Lackawanna Steel Co., Lackawanna, N. Y. (H., L.)
 Midvale Steel & Ordnance Co., New York, N. Y. (H., L.)
 National Steel Rolling Co. (The), New York, N. Y. (L.; see Addenda).
 National Tube Co. (The), Lorain, Ohio. (H., G.)
 New Process I. & S. Co., Noblesville, Ind. (projected; L.; see Addenda).
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Canada. (L.)
 Pacific Coast Steel Co., San Francisco, Cal. (R.)
 Pennsylvania Brake Beam Co., Danville, Pa. (R.)
 Rail Joint Co., New York, N. Y. (L.)
 Scranton Bolt & Nut Co., Scranton, Pa. (R.)
 Scullin Steel Co., St. Louis, Mo. (L.; building).
 Sweet's Steel Co., Williamsport, Pa. (R.)
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (H., L.)
 United States Rail Co., Cumberland, Md. (R.)
 West Virginia Rail Co. (The), Huntington, W. Va. (R.)

MANUFACTURERS OF STRUCTURAL SHAPES.

(H=HEAVY STRUCTURAL SHAPES. L=LIGHT STRUCTURAL SHAPES).

Algoma Steel Corporation, Sault Ste. Marie, Ont., Canada. (H., L.)
 American Bridge Co., Pittsburgh, Pa. (H., L.)
 Bethlehem Steel Co., Bethlehem, Pa. (H., L.)
 Buffalo Steel Co., Tonawanda, N. Y. (L.)
 Burlington Steel Co., Ltd., Hamilton, Ont., Canada. (L.)
 Calumet Steel Co., Chicago, Ill. (L.)
 Cambria Steel Co., Philadelphia, Pa. (H., L.)
 Cambridge Steel Co. (The), Cambridge, O. (bldg.; H., L., see Addenda).
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada. (H., L.)
 Carnegie Steel Co., Pittsburgh, Pa. (H., L.)
 Chrome Steel Works, Chrome, N. J. (H., L.)
 Colorado Fuel & Iron Co. (The), Denver, Col. (H., L.)
 Danville Structural Tubing Co., Danville, Pa. (L.)
 Dempsey (M. J.), New York, N. Y. (L.; long idle).
 Dilworth, Porter & Co., Inc., Pittsburgh, Pa. (L.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (H., L.)
 Donner Steel Co., Inc., Buffalo, N. Y. (H., L.)
 Eastern Steel Co. (The), Pottsville, Pa. (H., L.)
 Eckels-Nye Steel Co., Syracuse, N. Y. (L.)

Elyria Iron & Steel Co. (The), Cleveland, Ohio. (H., L.)
 Forged Steel Wheel Co., Pittsburgh, Pa. (H. L.; own use).
 Franklin Steel Works, Franklin, Pa. (L.)
 Hirsch Rolling Mill Co., St. Louis, Mo. (L.)
 Hoosier Rolling Mill Co., Terre Haute, Ind. (L.)
 Illinois Steel Co., Chicago, Ill. (H., L.)
 Inland Steel Co., Chicago, Ill. (H., L.)
 International Harvester Co., Chicago, Ill. (L.)
 Interstate Iron & Steel Co., Chicago, Ill. (H., L.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (H., L.)
 Judson Manufacturing Co., San Francisco, Cal. (H., L.)
 Knoxville Iron Co., Knoxville, Tenn. (L.)
 Lackawanna Steel Co., Lackawanna, N. Y. (H., L.)
 Laclede Steel Co., St. Louis, Mo. (L.)
 Lebanon Valley Iron & Steel Co., Lebanon, Pa. (L.)
 Llewellyn Iron Works, Los Angeles, Cal. (L.)
 Lockhart Iron & Steel Co., Pittsburgh, Pa. (L.)
 Logan Iron & Steel Co., Philadelphia, Pa. (L.)
 Midvale Steel & Ordnance Co., New York, N. Y. (H., L.)
 Minnesota Steel Co., Duluth, Minn. (H., L.)
 National Farming Mchy., Ltd., (The), Montmagny, P. Q., Can. (bldg.; L.)
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Can. (H., L.)
 Ohio Falls Iron Co., New Albany, Ind. (L.)
 Pacific Coast Steel Co., San Francisco, Cal. (H., L.)
 Pennsylvania Brake Beam Co., Danville, Pa. (H.)
 Phoenix Iron Co. (The), Philadelphia, Pa. (H., L.)
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa. (L.)
 Pollak Steel Co. (The), Cincinnati, Ohio. (H., L.)
 Reading Iron Co., Reading, Pa. (L.)
 Republic Iron & Steel Co., Youngstown, Ohio. (L.)
 Rockaway Rolling Mills Corp., Rockaway, N. J. (L.)
 Scullin Steel Co., St. Louis, Mo. (building; H., L.)
 Simmons Co., Kenosha, Wis. (L.; own use).
 Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada. (L.)
 Sweet's Steel Co., Williamsport, Pa. (L.)
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (H., L.)
 Union Rolling Mill Co., Cleveland, Ohio. (H.)
 United Steel Co., Everett, Wash. (building; L.)
 Utah Steel Corporation, Salt Lake City, Utah. (L.)
 Vancouver Rolling Mills Co., Ltd., Eburne, Vancouver, B. C., Can. (L.)
 Western Rolling Mill Corporation, Seattle, Wash. (projected).
 West Virginia Rail Co. (The), Huntington, West Va. (L.)
 Witherow Steel Co., Pittsburgh, Pa. (L.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (L.)

MANUFACTURERS OF WIRE RODS.

American Electrical Works, Phillipsdale, R. I.
 American Steel & Wire Co. (The), Cleveland, Ohio.

Ashland Steel Co., Ashland, Ky.
 Atlantic Steel Co., Atlanta, Ga.
 Black Steel & Wire Co., Kansas City, Mo.
 Cambria Steel Co., Philadelphia, Pa.
 Carpenter Steel Co. (The), Reading, Pa.
 Colonial Steel Co., Pittsburgh, Pa. (copper-clad).
 Colorado Fuel & Iron Co. (The), Denver, Col.
 Copper Clad Steel Co., Rankin, Pa. (copper-clad).
 Crucible Steel Co. of America, Pittsburgh, Pa. (for drill rods).
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada.
 Gulf States Steel Co., Birmingham, Ala.
 Halcomb Steel Co., Syracuse, N. Y. (for drill rods).
 Illinois Steel Co., Chicago, Ill.
 Interstate Iron & Steel Co., Chicago, Ill.
 Jones & Laughlin Steel Co., Pittsburgh, Pa.
 Keystone Steel & Wire Co., South Bartonville, Peoria, Ill.
 Kokomo Steel & Wire Co., Kokomo, Ind.
 Lackawanna Steel Co., Lackawanna, N. Y.
 Midvale Steel & Ordnance Co., New York, N. Y.
 Page Steel & Wire Co., Pittsburgh, Pa.
 Pittsburgh Steel Co., Pittsburgh, Pa.
 Roebling's (John A.) Sons Co., Trenton, N. J.
 Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
 Washburn Wire Co., Phillipsdale, R. I.
 Wickwire Bros., Cortland, N. Y.
 Wickwire Spencer Steel Corp., Worcester, Mass. (see Addenda).
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF UNIVERSAL AND SHEARED PLATES.

(U=UNIVERSAL PLATES, INCLUDING FLATS OVER 6 INCHES WIDE.

S.=SHEARED PLATES).

Alan Wood Iron & Steel Co., Philadelphia, Pa. (S.)
 Allegheny Steel Co., Brackenridge, Pa. (S.)
 American Bridge Co., Pittsburgh, Pa. (wide flats).
 American Sheet & Tin Plate Co., Pittsburgh, Pa. (S.)
 American Steel & Tube Co., Lorain, Ohio. (S.)
 American Steel & Wire Co. (The), Cleveland, Ohio. (S.)
 Bethlehem Steel Co., Bethlehem, Pa. (U., S.)
 Brier Hill Steel Co. (The), Youngstown, Ohio. (S.)
 Cambria Steel Co., Philadelphia, Pa. (U., S.)
 Canadian Car & Fdy. Co., Ltd., Montreal, P. Q., Canada (wide flats).
 Carbon Steel Co., Pittsburgh, Pa. (U., S.)
 Carnegie Steel Co., Pittsburgh, Pa. (U., S.)
 Central Iron & Steel Co., Harrisburg, Pa. (U., S.)
 Chrome Steel Works, Chrome, N. J. (S.)
 Cleveland Steel Co. (The), Cleveland, Ohio. (S.)
 Colonial Steel Co., Pittsburgh, Pa. (S.)

- Colorado Fuel & Iron Co. (The), Denver, Col. (wide flats).
 Crucible Steel Co. of America, Pittsburgh, Pa. (S.)
 Disston (Henry) & Sons Iron & Steel Works, Tacony, Phila., Pa. (S.)
 Dominion Foundries & Steel, Ltd., Hamilton, Ont., Canada. (S.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (S.)
 Donner Steel Co., Inc., Buffalo, N. Y. (S.)
 Eddystone Steel Co., Crum Lynne, Pa. (S.)
 Elyria Iron & Steel Co., Cleveland, Ohio. (wide flats).
 Forged Steel Wheel Co., Pittsburgh, Pa. (own use; U., S.)
 Glasgow Iron Co., Pottstown, Pa. (U., S.)
 Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa. (U.)
 Illinois Steel Co., Chicago, Ill. (U., S.)
 Inland Steel Co., Chicago, Ill. (U., S.)
 Interstate Iron & Steel Co., Chicago, Ill. (wide flats).
 Jessop Steel Co., Washington, Pa. (S.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (U., S.)
 Judson Manufacturing Co., San Francisco, Cal. (U.)
 La Belle Iron Works, Steubenville, Ohio. (U., S.)
 Lackawanna Steel Co., Lackawanna, N. Y. (U., S.)
 Lukens Steel Co. (The), Coatesville, Pa. (U., S.)
 Midvale Steel & Ordnance Co., New York, N. Y. (U., S.)
 Moorhead Brother & Co., Inc., Sharpsburg, Pa. (S.)
 Nagle Steel Co., Pottstown, Pa. (S.)
 National Enameling & Stamping Co., New York, N. Y. (U.)
 National Pressed Steel Co. (The), Massillon, Ohio. (U.)
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, Nova Scotia,
 Canada. (U., S.)
 Ohio Falls Iron Co., New Albany, Ind. (wide flats to 12").
 Otis Steel Co. (The), Cleveland, Ohio. (S.)
 Pacific Coast Steel Co., San Francisco, Cal. (wide flats.)
 Penn Seaboard Steel Corporation, Philadelphia, Pa. (S.)
 Pine Iron Works Co., Pine Forge, Pa. (S.)
 Republic Iron & Steel Co., Youngstown, Ohio. (S.)
 St. Louis Screw Co., St. Louis, Mo. (wide flats).
 Sharon Steel Hoop Co., Sharon, Pa. (S.)
 Simonds Manufacturing Co., Fitchburg, Mass. (own use; S. saw plates).
 Sligo Iron & Steel Co., Connellsville, Pa. (S.)
 Southern Pacific Co., San Francisco, Cal. (wide flats).
 Steel & Tube Company of America, Chicago, Ill. (U., S.)
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (S.; wide flats).
 United Alloy Steel Corporation, Canton, Ohio. (U.)
 Universal Steel Co., Bridgeville, Pa. (S.)
 Warren Iron & Steel Co. (The), Warren, Ohio. (S.)
 Whitaker-Glessner Co., Wheeling, W. Va. (S.)
 Worth Steel Co., Claymont, Del. (S.)
 Wrought Washer Co., Milwaukee, Wis. (own use; S.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (S.)

MANUFACTURERS OF BLACK SHEETS.

- Aetna Iron & Steel Corporation, Aetna, Ind. (projected).
Alan Wood Iron & Steel Co., Philadelphia, Pa.
Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co. (The), Middletown, Ohio.
American Sheet & Tin Plate Co., Pittsburgh, Pa.
American Steel & Tube Co., Lorain, Ohio.
Ames Shovel & Tool Co., Boston, Mass. (own use).
Apollo Steel Co., Apollo, Pa.
Ashland Iron & Mining Co., Ashland, Ky.
Ashtabula Steel Co. (The), Ashtabula, Ohio (building; see Addenda).
Berger Manufacturing Co. (The), Canton, Ohio.
Bethlehem Steel Co., Bethlehem, Pa.
- Brier Hill Steel Co. (The), Youngstown, Ohio.
Canonsburg Steel & Iron Works, Canonsburg, Pa.
Canton Sheet Steel Co. (The), Canton, Ohio.
Carbon Steel Co., Pittsburgh, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Chapman Price Steel Co., Indianapolis, Ind. (projected; see Addenda).
Cleveland Steel Co., (The), Cleveland, Ohio.
Crucible Steel Co. of America, Pittsburgh, Pa.
Disston (Henry) & Sons Iron & Steel Works, Tacony, Philadelphia, Pa.
Dominion Foundries & Steel, Ltd., Hamilton, Ont., Canada.
Eastern Rolling Mill Co., Baltimore, Md. (see Addenda).
Empire Rolling Mill Co. (The), Cleveland, Ohio.
Falcon Steel Co. (The), Niles, Ohio.
Follansbee Brothers Co., Pittsburgh, Pa.
Griffiths Charcoal Iron Mills, Washington, Pa.
Halcomb Steel Co., Syracuse, N. Y.
Illingworth (John) Steel Co. (The), Frankford, Philadelphia, Pa.
Indiana Rolling Mill Co., New Castle, Ind.
Inland Steel Co., Chicago, Ill.
Jessop Steel Co., Washington, Pa.
Jones & Laughlin Steel Co., Pittsburgh, Pa. (tin mill sizes).
La Belle Iron Works, Steubenville, Ohio.
Lalanc & Grosjean Manufacturing Co., New York, N. Y. (own use).
McCullough Iron Co., Wilmington, Del.
Mahoning Valley Steel Co. (The), Niles, Ohio.
Mansfield Sheet & Tinsplate Co., Mansfield, Ohio.
Massillon Rolling Mill Co. (The), Massillon, Ohio.
Milwaukee Rolling Mill Co., Milwaukee, Wis. (building).
Monongahela Iron & Steel Co., Pittsburgh, Pa. (idle).
Moorhead Brother & Co., Inc., Sharpsburg, Pa.
National Enameling & Stamping Co., New York, N. Y.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co. (The), Newton Falls, Ohio.
Otis Steel Co. (The), Cleveland, Ohio.
Parkersburg Iron & Steel Co., Parkersburg, W. Va.

Reeves Manufacturing Co., Dover, Ohio.
 Republic Iron & Steel Co., Youngstown, Ohio.
 Seneca Iron & Steel Co., Buffalo, N. Y.
 Sharon Steel Hoop Co., Sharon, Pa.
 Simonds Manufacturing Co., Fitchburg, Mass.
 Sligo Iron & Steel Co., Connellsville, Pa.
 Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
 Superior Sheet Steel Co. (The), Canton, Ohio (building; see Addenda).
 Taylor (N. & G.) Co., Inc., Philadelphia, Pa.
 Tremont Nail Co., West Wareham, Mass.
 Trumbull Steel Co. (The), Warren, Ohio.
 Universal Steel Co., Bridgeville, Pa.
 Warren Iron & Steel Co. (The), Warren, Ohio.
 West Penn Steel Co., Brackenridge, Pa.
 Whitaker-Glessner Co., Wheeling, W. Va.
 Wilkes Rolling Mill Co., Sharon, Pa.
 Wrought Washer Mfg. Co., Milwaukee, Wis. (own use).
 Wyoming Shovel Works (The), Wyoming, Pa.
 Youngstown Sheet & Tube Co. (The), Youngstown Ohio.

MANUFACTURERS OF GALVANIZED SHEETS.

(NOT INCLUDING MANUFACTURERS OF GALVANIZED SHEETS IN CANADA).

Abendroth & Root Mfg. Co., Newburgh, N. Y.
 American Rolling Mill Co. (The), Middletown, Ohio.
 American Sheet & Tin Plate Co., Pittsburgh, Pa.
 Apollo Steel Co., Apollo, Pa.
 Ashland Iron and Mining Co., Ashland, Ky.
 Ashtabula Steel Co. (The), Ashtabula, Ohio (building; see Addenda).
 Berger Manufacturing Co. (The), Canton, Ohio.
 Bethlehem Steel Co., Bethlehem, Pa.
 Brier Hill Steel Co. (The), Youngstown, Ohio.
 Brown Stamping Co. (The), Toledo, Ohio.
 Buffalo Galvanizing and Tinning Works, Buffalo, N. Y.
 Canton Sheet Steel Co. (The), Canton, Ohio.
 Chapman Price Steel Co., Indianapolis, Ind. (see Addenda).
 Cold Galvanizing Co. (The), Cleveland, Ohio.
 Cramp & Sons Ship and Engine Building Co. (The Wm.), Phila. Pa.
 Delphos Manufacturing Co. (The), Delphos, Ohio.
 Empire Galvanizing Co., Inc. (The), Philadelphia, Pa.
 Falcon Steel Co. (The), Niles, Ohio.
 Follansbee Brothers Co., Pittsburgh, Pa.
 Gem Stamped Steel Co., Chelsea Station, Boston, Mass.
 Hanlon-Gregory Galvanizing Co., Pittsburgh, Pa.
 Inland Steel Co., Chicago, Ill.
 La Belle Iron Works, Steubenville, Ohio.

Lamb & Ritchie Co., Cambridge, Mass.
Lefferts Galvanizing Works, New York, N. Y.
Los Angeles Galvanizing Co., Inc., Los Angeles, Cal.
Louisville Sheet Steel Co. (The), Canton, Ohio.
McCullough Iron Co., Wilmington, Del.
McVoy Sheet & Tin Plate Co., Chicago, Ill.
Mahoning Valley Steel Co. (The), Niles, Ohio.
Milwaukee Rolling Mill Co., Milwaukee, Wis. (building).
National Enameling & Stamping Co., New York, N. Y.
National Galvanizing Co. (The), Chicago, Ill.
National Sheet Metal Roofing Co., Jersey City, N. J.
Newport Rolling Mill Co., Newport, Ky.
Ohio Galvanizing & Manufacturing Co. (The), Niles, Ohio.
Otis Steel Co. (The), Cleveland, Ohio (building).
Parkersburg Iron & Steel Co., Parkersburg, W. Va.
Pittsburgh Galvanizing Co., Pittsburgh, Pa.
Reeves Manufacturing Co., Dover, Ohio.
Republic Iron & Steel Co., Youngstown, Ohio.
Schlueter Manufacturing Co., St. Louis, Mo.
Sharon Steel Hoop Co., Sharon, Pa.
Superior Sheet Steel Co. (The), Canton, Ohio (building; see Addenda).
Trumbull Steel Co. (The), Warren, Ohio.
Wheeling Metal & Manufacturing Co., Wheeling, West Va.
Whitaker-Glessner Co., Wheeling, W. Va.
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF BLACK PLATES FOR TINNING.

American Sheet & Tin Plate Co., Pittsburgh, Pa.
American Steel Co., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Canonsburg Steel & Iron Works, Canonsburg, Pa.
Carnahan Tin Plate & Sheet Co. (The), Canton, Ohio.
Follansbee Brothers Co., Pittsburgh, Pa.
Griffiths Charcoal Iron Mills, Washington, Pa.
Hudson Sheet & Tinplate Co., Inc., Marietta, Ohio.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lalace & Grosjean Manufacturing Co., New York, N. Y. (own use).
McKeesport Tin Plate Co., McKeesport, Pa.
Mansfield Sheet & Tinplate Co., Mansfield, Ohio.
National Enameling & Stamping Co., New York, N. Y.
Pittsburgh Tin Plate & Steel Corporation, Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, Ohio.
Standard Tin Plate Co. (The), Canonsburg, Pa.
Taylor (N. & G.) Co., Inc., Philadelphia, Pa.
Trumbull Steel Co. (The), Warren, Ohio.

Washington Tinplate Co., Washington, Pa.
 Weirton Steel Co., Weirton, W. Va.
 Wheeling Steel & Iron Co., Wheeling, W. Va.
 Whitaker-Glessner Co., Wheeling, W. Va.

MANUFACTURERS OF TINPLATES AND TERNE PLATES.

American Sheet & Tin Plate Co., Pittsburgh, Pa.
 American Steel Co., Pittsburgh, Pa.
 Bethlehem Steel Co., Bethlehem, Pa.
 Carnahan Tin Plate & Sheet Co. (The), Canton, Ohio.
 Follansbee Brothers Co., Pittsburgh, Pa.
 Griffiths Charcoal Iron Mills, Washington, Pa. (terne plates only).
 Hudson Sheet & Tinplate Co., Inc., Marietta, Ohio.
 Jones & Laughlin Steel Co., Pittsburgh, Pa.
 Lalance & Grosjean Manufacturing Co., New York, N. Y. (own use).
 McKeesport Tin Plate Co., McKeesport, Pa.
 Merchant & Evans Co., Philadelphia, Pa.
 National Enameling & Stamping Co., New York, N. Y.
 Pittsburgh Tin Plate & Steel Corporation, Pittsburgh, Pa.
 Reeves Manufacturing Co., Dover, Ohio (long terne plates).
 Standard Tin Plate Co. (The), Canonsburg, Pa.
 Sturges & Burn Manufacturing Co., Chicago, Ill. (own use).
 Taylor (N. & G.) Co., Inc., Philadelphia, Pa.
 Trumbull Steel Co. (The), Warren, Ohio.
 Washington Tinplate Co., Washington, Pa.
 Weirton Steel Co., Weirton, W. Va.
 Wheeling Steel & Iron Co., Wheeling W. Va.
 Whitaker-Glessner Co., Wheeling, W. Va.
 Wilkes Rolling Mill Co., Sharon, Pa.

MANUFACTURERS OF MUCK BAR.

Altoona Iron Co. (The), Altoona, Pa.
 American Car and Foundry Co., New York, N. Y.
 American-Swedo Iron Co., Philadelphia, Pa.
 Bethlehem Steel Co., Bethlehem, Pa.
 Blandon Rolling Mill, Inc., Blandon, Pa.
 Brown & Co., Inc., Pittsburgh, Pa. (own use).
 Burden Iron Co., Troy, N. Y. (own use).
 Byers (A. M.) Co., Pittsburgh, Pa. (own use).
 Canadian Western Steel Corp., Ltd., Calgary, Alberta, Canada.
 Cohoes Rolling Mill Co., Cohoes, N. Y. (own use).
 Colonial Steel Co., Pittsburgh, Pa.
 Cyclops Steel Co., Inc., New York, N. Y.
 East End Puddle Mill, Milton, Pa.
 Edwards, E. T., Columbia, Pa.

Eichleay, J. P. & W. B., Pittsburgh, Pa. (see Addenda).
 Empire Rolling Mill Co. (The), Cleveland, Ohio.
 Ewald Iron Co., Louisville, Ky. (own use).
 Fort Wayne Rolling Mill Corporation (The), Fort Wayne, Ind.
 Glasgow Iron Co., Pottstown, Pa.
 Highland Iron & Steel Co. (The), Terre Haute, Ind.
 Hoopes & Townsend Co., Philadelphia, Pa.
 Hughes & Patterson, Philadelphia, Pa.
 Interstate Iron & Steel Co., Chicago, Ill.
 Kentucky Iron & Steel Co., Inc., Louisville, Ky. (see Addenda).
 Kittanning Iron & Steel Manufacturing Co., Pittsburgh, Pa.
 Knoxville Iron Co., Knoxville, Tenn.
 Lake Erie Bolt & Nut Co. (The), Cleveland, Ohio.
 Lebanon Valley Iron & Steel Co., Lebanon, Pa.
 Lockhart Iron & Steel Co., Pittsburgh, Pa.
 Logan Iron & Steel Co., Philadelphia, Pa. (own use).
 London Rolling Mill Co., Ltd., London, Ont., Canada (own use).
 Massachusetts Iron & Steel Co., Danvers, Mass. (see Addenda).
 Milton Manufacturing Co. (The), Milton, Pa. (see Addenda).
 Monongahela Iron & Steel Co., Pittsburgh, Pa.
 Moorhead Brother & Co., Inc., Sharpsburg, Pa.
 National Rolling Mill Co., Vincennes, Ind.
 National Tube Co., Pittsburgh, Pa.
 Ohio Falls Iron Co., New Albany, Ind.
 Old Dominion Iron & Steel Corporation, Belle Isle, Richmond, Va.
 Pacific Coast Steel Co., San Francisco, Cal.
 Penn Iron & Steel Co., Creighton, Pa.
 Penn Steel & Iron Corporation, Lancaster, Pa.
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa.
 Reading Iron Co., Reading, Pa.
 Republic Iron & Steel Co., Youngstown, Ohio.
 Rome Iron Mills, Inc., New York, N. Y. (own use).
 Scranton Bolt & Nut Co., Scranton, Pa. (own use).
 Slatington Iron & Steel Co., New York, N. Y.
 Sligo Iron & Steel Co., Connellsville, Pa.
 Ulster Iron Works, Dover, N. J.
 Union Rolling Mill Co. (The), Cleveland, Ohio.
 Wilkes Rolling Mill Co., Sharon, Pa.
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio (own use).

MANUFACTURERS OF MERCHANT BARS.

(I.—IRON BARS. S—STEEL BARS. R—REINFORCING BARS).

(For special high-carbon and alloy steel bars, see Manufacturers of Tool Steel. See also Manufacturers of Horseshoe Bars and Horseshoes).

Aetna Nut Co. (The), Southington, Conn. (I.)
 Algoma Steel Corporation, Sault Ste. Marie, Ont., Canada. (S.)
 Altoona Iron Co. (The), Altoona, Pa. (I.)

American Bridge Co., Pittsburgh, Pa. (S.)
 American Car & Foundry Co., New York, N. Y. (I., S.)
 American Horseshoe Co., Phillipsburg, N. J. (I., S.)
 American Steel & Wire Co. (The), Cleveland, Ohio. (S.)
 Ames (W.) & Co., Jersey City, N. J. (I., R.)
 Armstrong (G. W.) & Co., Inc., Fort Worth, Texas. (I., R.)
 Armstrong, Whitworth of Canada, Ltd., Montreal, P. Q., Canada. (S.)
 Atlantic Coast Line R. R. Co., Wilmington, N. C. (own use; I.)
 Atlantic Steel Co., Atlanta, Ga. (S., R.)
 Baldwin Locomotive Works (The), Philadelphia, Pa. (own use; I., S.)
 Baltimore & Ohio Railroad Co., Baltimore, Md. (own use; I., S.)
 Bancroft & Martin Rolling Mills Co., South Portland, Me. (I., S., R.)
 Bethlehem Steel Co., Bethlehem, Pa. (I., S., R.)
 Black Steel & Wire Co., Kansas City, Mo. (S.)
 Brown & Co., Inc., Pittsburgh, Pa. (I.)
 Buffalo Bolt Co., Buffalo, N. Y. (I., S.)
 Buffalo Steel Co., Tonawanda, N. Y. (S., R.)
 Burden Iron Co., Troy, N. Y. (I.)
 Burlington Steel Co., Ltd., Hamilton, Ont., Canada. (S., R.)
 Calumet Steel Co., Chicago, Ill. (S., R.)
 Cambria Steel Co. (The), Philadelphia, Pa. (S., R.)
 Cambridge Steel Co. (The), Cambridge, O. (bldg.; I., S., R.; see Addenda).
 Canadian Car & Foundry Co., Ltd., Montreal, P. Q., Canada. (I., S.)
 Canadian Rolling Mills, Ltd., Montreal, P. Q., Canada. (I., S., R.)
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada. (S.)
 Canadian Western Steel Corp., Calgary, Alberta, Canada. (I., S., R.)
 Canton Sheet Steel Co. (The), Canton, Ohio. (S.)
 Capital City Iron & Steel Co., Harrisburg, Pa. (building; I., S.)
 Carbon Steel Co., Pittsburgh, Pa. (S.)
 Carnegie Steel Co., Pittsburgh, Pa. (S., R.)
 Carpenter Steel Co. (The), Reading, Pa. (S.)
 Central of Georgia Railway Co., Savannah, Ga. (own use; I.)
 Cleveland Hardware Co. (The), Cleveland, Ohio (own use; S.)
 Collins Co. (The), Collinsville, Conn. (own use; I., S.)
 Colorado Fuel & Iron Co. (The), Denver, Col. (I., S., R.)
 Columbia Steel Co., San Francisco, Cal. (S.; see Addenda.)
 Cowin (Frederick) & Co., Inc., Chicago, Ill. (I.; idle; for sale or lease.)
 Cromwell Steel Co. (The), Cleveland, Ohio. (S.)
 Crucible Steel Co. of America, Pittsburgh, Pa. (S.)
 Danville Iron & Steel Co., Danville, Pa. (idle).
 Davis Bros. Rolling Mill & Spike Works, Philadelphia, Pa. (S., R.)
 Del., Lack. & Western R. R. Co. (The), Scranton, Pa. (own use; I.)
 Dempsey (M. J.), New York, N. Y. (long idle; I.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (S., R.)
 Donner Steel Co., Inc., Buffalo, N. Y. (S.)
 Eckels-Nye Steel Co., Syracuse, N. Y. (S.)
 Edwards, E. T., Columbia, Pa. (I., S.)

- Eichleay, J. P. & W. B., Pittsburgh, Pa. (I.; for lease; see Addenda).
 Elyria Iron & Steel Co. (The), Cleveland, Ohio. (S.)
 Empire Rolling Mill Co. (The), Cleveland, Ohio. (I., S.)
 Ewald Iron Co. of Delaware, Louisville, Ky. (I.)
 Falls Hollow Staybolt Co., Cuyahoga Falls, Ohio (staybolt iron bars).
 Forged Steel Wheel Co., Pittsburgh, Pa. (own use; S.)
 Fort Dodge Culvert & Iron Mills Co., Ft. Dodge, Iowa. (S., R.)
 Fort Smith Iron & Steel Mills, Fort Smith, Arkansas. (I., S.)
 Fort Wayne Rolling Mill Corp'n. (The), Fort Wayne, Ind. (I., S., R.)
 Franklin Steel Works, Franklin, Pa. (S., R.)
 General Steel Co., Milwaukee, Wis. (S.; building).
 Gerson Rolling Mill, Birmingham, Ala. (I.)
 Glasgow Iron Co., Pottstown, Pa. (I., S.)
 Grand Trunk Ry. System, Montreal, P. Q., Canada (own use; I.)
 Great Northern Railroad, St. Cloud, Minn. (own use; I., R.)
 Gulf States Steel Co., Birmingham, Ala. (S., R.)
 Harrow Spring Co., Milwaukee, Wis. (S.)
 Hess Steel Corporation (The), Baltimore, Md. (S.)
 Highland Iron & Steel Co. (The), Terre Haute, Ind. (I., S.)
 Hirsch Rolling Mill Co., St. Louis, Mo. (I., S., R.)
 Hoopes & Townsend Co., Philadelphia, Pa. (I., S.)
 Hoosier Rolling Mill Co., Terre Haute, Ind. (I., S.)
 Hughes & Patterson, Philadelphia, Pa. (I.)
 Hyatt Steel Products, Ltd., Vancouver, B. C., Canada. (I., S.)
 Illinois Steel Co., Chicago, Ill. (S., R.)
 Inland Steel Co., Chicago, Ill. (S., R.)
 International Harvester Co., Chicago, Ill. (S., R.)
 Interstate Iron & Steel Co., Chicago, Ill. (I., S., R.)
 Janson Steel & Iron Co., Columbia, Pa. (I., S., R.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (S., R.)
 Judson Manufacturing Co., San Francisco, Cal. (I., S.)
 Kansas City Bolt & Nut Co. (The), Kansas City, Mo. (I., S., R.)
 Kansas City Southern Ry. Co. (The), Kansas City, Missouri (idle;
 own use; I.)
 Kentucky Iron & Steel Co., Inc., Louisville, Ky. (I., S., R.; see Addenda).
 Kilby Car & Foundry Co., Anniston, Ala. (I., S.)
 Knoxville Iron Co., Knoxville, Tenn. (I., S., R.)
 La Belle Iron Works, Steubenville, Ohio. (S.)
 Lackawanna Steel Co., Lackawanna, N. Y. (S., R.)
 Laclede Steel Co., St. Louis, Mo. (S., R.)
 Lebanon Valley Iron & Steel Co., Lebanon, Pa. (I.)
 Llewellyn Iron Works, Los Angeles, Cal. (S., R.)
 Lockhart Iron & Steel Co., Pittsburgh, Pa. (I., S.)
 Logan Iron & Steel Co., Philadelphia, Pa. (I., S.)
 London Rolling Mill Co., Ltd., London, Ont., Canada. (I.)
 Manitoba Rolling Mill Co., Ltd., Winnipeg, Manitoba, Can. (I., S., R.)
 Massachusetts Iron & Steel Co., Danvers, Mass. (I., S.; see Addenda).

- Midvale Steel & Ordnance Co., New York, N. Y. (S., R.)
 Milton Manufacturing Co. (The), Milton, Pa. (I., S., R.; see Addenda).
 Minnesota Steel Co., Duluth, Minn. (S., R.)
 Moorhead Brother & Co., Inc., Sharpsburg, Pa. (I., S.)
 National Farming Machinery, Ltd. (The), Montmagny, P. Q., Can. (bldg.; S.)
 National Lock Washer Co. (The), Newark, N. J. (S.)
 National Rolling Mill Co., Vincennes, Ind. (I., S.)
 National Steel Rolling Co. (The), New York. (I., S., R.; see Addenda).
 National Tube Co. (The), Lorain, Ohio. (S.)
 New Process I. & S. Co., Noblesville, Ind. (projected; I.; see Addenda).
 New York Central R. R., New York, N. Y. (own use; I., S.)
 Nicetown Plate Washer Co., Inc., Philadelphia, Pa. (I., S., R.)
 Nickel-Alloys Co., Pittsburgh, Pa. (I., S., R.)
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Can. (S., R.)
 Ohio Falls Iron Co., New Albany, Ind. (I., S., R.)
 Old Dominion Iron & Steel Corp., Belle Isle, Richmond, Va. (I., S.)
 Oliver Iron & Steel Co., Pittsburgh, Pa. (own use; S.)
 Pacific Coast Steel Co., San Francisco, Cal. (I., S., R.)
 Panama Canal (The), Balboa Heights, Canal Zone, Panama. (I., S.)
 Pardee (The C.) Works, Perth Amboy, N. J. (S., R.)
 Peck Rolling Mills, Ltd., Montreal, P. Q., Canada. (I., S., R.)
 Peerless Drawn Steel Co. (The), Massillon, Ohio (building; S.)
 Penn Iron & Steel Co., Creighton, Pa. (I.)
 Penn Steel & Iron Corporation, Lancaster, Pa. (I.)
 Phoenix Iron Co. (The), Philadelphia, Pa. (S.)
 Pittsburgh Crucible Steel Co., Pittsburgh, Pa. (S.)
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa. (I.)
 Pollak Steel Co. (The), Cincinnati, Ohio. (S., R.)
 Portland Rolling Mills, Ltd. (The), St. John, N. B., Canada. (I.)
 Pullman Co. (The), Chicago, Ill. (I., S.)
 Railway Steel-Spring Co., New York, N. Y. (S.)
 Reading Iron Co., Reading, Pa. (I.)
 Republic Iron & Steel Co., Youngstown, Ohio. (I., S., R.)
 Riverdale Rolling Mill Co., Chicago, Ill. (I.)
 Rockaway Rolling Mills Corporation, Rockaway, N. J. (I., S.)
 Rome Iron Mills, Inc., New York, N. Y. (staybolt and engine bolt iron).
 St. Louis Screw Co., St. Louis, Mo. (I., S.)
 Scranton Bolt & Nut Co., Scranton, Pa. (I.)
 Scullin Steel Co., St. Louis, Mo. (building; S.)
 Simmons Co., Kenosha, Wis. (own use; S.)
 Singer Manufacturing Co., New York, N. Y. (own use; S.)
 Slatington Iron & Steel Co., New York, N. Y. (I., S.)
 Sligo Iron & Steel Co., Connellsville, Pa. (I., S.)
 Southern California Iron & Steel Co., Los Angeles, Cal. (S., R.)
 Southern Pacific Co., San Francisco, Cal. (I., S.)
 Standard Seamless Tube Co., Pittsburgh, Pa. (S.)
 Starr Manufacturing Co., Ltd. (The), Dartmouth, N. S., Canada. (I.)

Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada. (I., S.)
 Sweet's Steel Co., Williamsport, Pa. (S., R.)
 Tacony Steel Co., Tacony, Philadelphia, Pa. (S.)
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (S., R.)
 Timken Roller Bearing Co. (The), Canton, Ohio. (S.; also forging).
 Tredegar Co. (The), Richmond, Va. (I., S.)
 Tuttle, Charles W. (Auburn Iron Works), Auburn, N. Y. (I.)
 Ulster Iron Works, Dover, N. J. (I.)
 Union Rolling Mill Co. (The), Cleveland, Ohio. (I., S., R.)
 United Alloy Steel Corporation, Canton, Ohio. (S.)
 United States Horse Shoe Co., Erie, Pa. (I., S.)
 United Steel Co., Everett, Washington (building; I., S., R.)
 Upson Nut Co. (The), Cleveland, Ohio. (S.)
 Utah Steel Corporation, Salt Lake City, Utah. (I., S., R.)
 Vancouver Rolling Mills Co., Ltd., Eburne, Vancouver, British Columbia, Canada. (I., S.)
 Western Rolling Mill Corporation, Seattle, Wash. (projected).
 West Virginia Rail Co. (The), Huntington, West Va. (S., R.)
 Westerman & Co., Lockport, N. Y. (I.)
 Whitaker-Glessner Co., Wheeling, W. Va. (S.)
 Witherow Steel Co., Pittsburgh, Pa. (S., R.)
 Wurster (F. W.) & Co., Brooklyn, N. Y. (I., S., R.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (S., R.)

MANUFACTURERS OF TOOL AND HIGH SPEED STEEL.

(INCLUDES ROLLED, HAMMERED AND CAST STEEL).

Anglo-Canadian Malleable Steel Mfg. Co., Ltd., Rawdon, P. Q., Canada.
 Armstrong, Whitworth of Canada, Ltd., Montreal, P. Q., Canada.
 Atlas Crucible Steel Co., Dunkirk, N. Y.
 Becker Steel Co. of America, Inc., New York, N. Y.
 ✓ Bethlehem Steel Co., Bethlehem, Pa.
 Bird Archer Co. (The), New York, N. Y. (building).
 Braeburn Steel Co., Braeburn, Pa.
 Brown & Co., Inc., Pittsburgh, Pa.
 Carbon Steel Co., Pittsburgh, Pa.
 Carpenter Steel Co. (The), Reading, Pa.
 Century Steel Co. of America, Poughkeepsie, N. Y.
 Chicago Electric Steel Co., Chicago, Ill.
 Chrome Steel Works, Chrome, N. J.
 Coes Wrench Co., Worcester, Mass. (own use).
 Collins Co. (The), Collinsville, Conn. (own use).
 Colonial Steel Co., Pittsburgh, Pa.
 Columbia Tool Steel Co., Chicago Heights, Ill.
 Connecticut Electric Steel Co. (The), Hartford, Conn.
 Connolly Steel Casting Co., Chelsea, Mass.

Crucible Steel Co. of America, Pittsburgh, Pa.
 Cyclops Steel Co., Inc., New York, N. Y.
 Davidson Tool Manufacturing Corporation (The), New York, N. Y.
 Dillon Crucible Alloys, Ltd., Welland, Ont., Canada.
 Disston (Henry) & Sons Iron & Steel Works, Tacony, Philadelphia, Pa.
 Eddystone Steel Co., Crum Lynne, Pa.
 Electric Alloy Steel Co. (The), Youngstown, Ohio (see Addenda).
 Electric Steel & Forge Co., Cleveland, Ohio.
 Electro Steel Co., Inc. (The), Pittsburgh, Pa.
 Erie Crucible Steel Co., Erie, Pa.
 Firth-Sterling Steel Co., McKeesport, Pa.
 General Electric Co., Schenectady, N. Y.
 Halcomb Steel Co., Syracuse, N. Y.
 Hammond Steel Co., Inc. (The), Syracuse, N. Y.
 Heller Brothers Co., Newark, N. J. (own use).
 Hess Steel Corporation (The), Baltimore, Md.
 Illingworth (John) Steel Co. (The), Frankford, Philadelphia, Pa.
 International High Speed Steel Co., Rockaway, N. J.
 Jessop Steel Co., Washington, Pa.
 Latrobe Electric Steel Co., Latrobe, Pa.
 Le Moyne Steel Co., Pittsburgh, Pa.
 Liberty Steel Co., Morristown, N. J. (see Addenda).
 Ludlum Steel Co., Watervliet, N. Y.
 Lundin Steel Casting Co. (The), Neponset, Boston, Mass.
 McInnes Steel Co., Ltd., Corry, Pa.
 Midvale Steel & Ordnance Co., New York, N. Y.
 Onondaga Steel Co., Syracuse, N. Y.
 Ontario Electric Steel Co., Poughkeepsie, N. Y.
 Railway Steel-Spring Co., New York, N. Y.
 Rothert Process Steel Co., Seattle, Washington.
 Simonds Manufacturing Co., Fitchburg, Mass.
 Syracuse Alloy Steel Co., Syracuse, N. Y.
 Trojan Electric Steel Co., Chicago, Ill.
 Union Tool Co., Torrance, Cal.
 United States High Speed Steel & Tool Corporation, New York City,
 New York.
 Universal Steel Co., Bridgeville, Pa.
 Vanadium Alloys Steel Co., Latrobe, Pa.
 Vulcan Crucible Steel Co., Aliquippa, Pa.

MANUFACTURERS OF HORSESHOE BARS AND HORSESHOES.

American Horse Shoe Co., Phillipsburg, N. J.
 American Steel & Wire Co. (The), Cleveland, Ohio.
 Burden Iron Co., Troy, N. Y.

Canadian Horse Shoe Co., Ltd., Hamilton, Ont., Canada (idle).
Champion Horse Shoe Co., Pawtucket, Rhode Island.
Cincinnati Horse Shoe & Iron Co. (The), Cleves, Ohio.
Dempsey (M. J.), New York, N. Y. (long idle).
Manufacturers Iron & Steel Co., New Brunswick, N. J.
Old Dominion Iron & Steel Corporation, Belle Isle, Richmond, Va.
Peck Rolling Mills, Ltd., Montreal, P. Q., Canada.
Phoenix Horse Shoe Co., Chicago, Ill.
Standard Horseshoe Co., Boston, Mass.
Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
Tredegar Co. (The), Richmond, Va.
Tuttle, Charles W. (Auburn Iron Works), Auburn, N. Y. (bars only).
United States Horse Shoe Co., Erie, Pa.

MANUFACTURERS OF HOOPS, BANDS AND COTTON TIES.

Acme Steel Goods Co., Chicago, Ill.
American Electrical Works, Phillipsdale, Rhode Island.
American Tube & Stamping Co., Bridgeport, Conn.
Atlantic Steel Co., Atlanta, Ga.
Bethlehem Steel Co., Bethlehem, Pa.
Cambria Steel Co., Philadelphia, Pa.
Canadian Western Steel Corp., Ltd., Calgary, Alberta, Canada.
Carnegie Steel Co., Pittsburgh, Pa.
Connors Steel Co., Inc., Birmingham, Ala.
Connors-Weyman Steel Co., Birmingham, Ala.
Fort Wayne Rolling Mill Corporation (The), Fort Wayne, Ind.
Hughes & Patterson, Philadelphia, Pa.
Illinois Steel Co., Chicago, Ill.
Interstate Iron & Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Midvale Steel & Ordnance Co., New York, N. Y.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, Ohio.
Sharon Steel Hoop Co., Sharon, Pa.
Stanley Works (The), New Britain, Conn.
Universal Steel Co., Bridgeville, Pa.
Vancouver Rolling Mills Co., Ltd., Eburne, Vancouver, British Columbia, Canada.
Weirton Steel Co., Weirton, West Va.
West Leechburg Steel Co., Pittsburgh, Pa.
Worcester Pressed Steel Co., Worcester, Mass. (building.)
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF ROLLED LONG ANGLE SPLICE BARS, LONG TIE PLATE BARS, ETC.

Algoma Steel Corporation, Sault Ste. Marie, Province of Ontario,
Canada.

American Steel & Tube Co., Lorain, Ohio.

Ames (W.) & Co., Jersey City, N. J.

Bethlehem Steel Co., Bethlehem, Pa.

Cambria Steel Co., Philadelphia, Pa.

Carnegie Steel Co., Pittsburgh, Pa.

Colorado Fuel & Iron Co. (The), Denver, Col.

Dilworth, Porter & Co., Inc., Pittsburgh, Pa.

Donner Steel Co., Inc., Buffalo, N. Y.

Elyria Iron & Steel Co. (The), Cleveland, Ohio.

Gulf States Steel Co., Birmingham, Ala.

Hoosier Rolling Mill Co., Terre Haute, Ind.

Illinois Steel Co., Chicago, Ill.

Inland Steel Co., Chicago, Ill.

Interstate Iron & Steel Co., Chicago, Ill.

Jones & Laughlin Steel Co., Pittsburgh, Pa.

Judson Manufacturing Co., San Francisco, Cal.

Lackawanna Steel Co., Lackawanna, N. Y.

Midvale Steel & Ordnance Co., New York, N. Y.

National Tube Co. (The), Lorain, Ohio.

Nova Scotia Steel & Coal Co., Ltd., New Glasgow, Nova Scotia,
Canada.

Pacific Coast Steel Co., San Francisco, Cal.

Pittsburgh Forge & Iron Co., Pittsburgh, Pa.

Rail Joint Co. (The), New York, N. Y.

Reading Iron Co., Reading, Pa.

Sellers Manufacturing Co., Chicago, Ill.

Southern Pacific Co., San Francisco, Cal. (own use).

Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.

Sweet's Steel Co., Williamsport, Pa.

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Tredegear Co. (The), Richmond, Va.

West Virginia Rail Co. (The), Huntington, West Va.

Whitaker-Glessner Co., Wheeling, West Va.

MANUFACTURERS OF IRON AND STEEL SKELP.

(I.—IRON SKELP. S—STEEL SKELP).

Allegheny Steel Co., Pittsburgh, Pa. (I., S.)

Blandon Rolling Mill, Inc., Blandon, Pa. (I.)

Byers (A. M.) Co., Pittsburgh, Pa. (I.)

Cambria Steel Co., Philadelphia, Pa. (S.)

Carnegie Steel Co., Pittsburgh, Pa. (S.)

Cohoes Rolling Mill Co., Cohoes, N. Y. (own use; I.)
 Curtin Forge Co., Curtin, Pa. (I.)
 Danville Structural Tubing Co., Danville, Pa. (S.)
 Elyria Iron & Steel Co. (The), Cleveland, Ohio. (S.)
 Glasgow Iron Co., Pottstown, Pa. (I.)
 Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa. (S.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (S.)
 La Belle Iron Works, Steubenville, Ohio. (S.)
 Lockhart Iron & Steel Co., Pittsburgh, Pa. (I.)
 Midvale Steel & Ordnance Co., New York, N. Y. (I., S.)
 Moorhead Brother & Co., Inc., Sharpsburg, Pa. (I., S.)
 National Tube Co., Pittsburgh, Pa. (S.)
 National Tube Co. (The), Lorain, Ohio. (S.)
 Nickel-Alloys Co., Pittsburgh, Pa. (I.)
 Parkesburg Iron Co., Parkesburg, Pa. (I.)
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa. (I.)
 Reading Iron Co., Reading, Pa. (own use; I., S.)
 Reeves Manufacturing Co., Dover, Ohio. (I.)
 Republic Iron & Steel Co., Youngstown, Ohio. (S.)
 Spang, Chalfant & Co., Pittsburgh, Pa. (own use; I., S.)
 Steel and Tube Co. of America, Chicago, Ill. (S.)
 Tremont Nail Co., West Wareham, Mass. (S.)
 Tyler Tube & Pipe Co. (The), Washington, Pa. (I., S.)
 Wheeling Steel & Iron Co., Wheeling, West Va. (S.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (I., S.)

MANUFACTURERS OF HOT ROLLED STRIP STEEL, NOT
 INCLUDING THOSE WHO MAKE COLD
 ROLLED STRIPS ONLY.

(H. R. = HOT ROLLED. C. R. = COLD ROLLED).

Acme Steel Goods Co., Chicago, Ill. (H. R., C. R.)
 American Steel & Wire Co. (The), Cleveland, Ohio. (H. R., C. R.)
 American Tube & Stamping Company, Bridgeport, Connecticut.
 (H. R., C. R.)
 Elyria Iron & Steel Co. (The), Cleveland, Ohio. (H. R., C. R.)
 Laclede Steel Co., St. Louis, Mo. (H. R.)
 National Pressed Steel Co. (The), Massillon, Ohio. (H. R.)
 Sharon Steel Hoop Co., Sharon, Pa. (H. R.)
 Superior Steel Corporation, Pittsburgh, Pa. (H. R., C. R.)
 Trumbull Steel Co. (The), Warren, Ohio. (H. R., C. R.)
 Weirton Steel Co., Weirton, W. Va. (H. R., C. R.)
 West Leechburg Steel Co., Pittsburgh, Pa. (H. R., C. R.)
 Worcester Pressed Steel Co., Worcester, Mass. (building hot strip
 mills; C. R.)

MANUFACTURERS OF WROUGHT IRON AND STEEL PIPE AND BOILER TUBES.

(I.—IRON PIPE. S.—STEEL PIPE. B. T.—BOILER TUBES).

Allegheny Steel Co., Brackenridge, Pa. (I. & S. B. T.)
 Byers (A. M.) Co., Pittsburgh, Pa. (I.)
 Canadian Tube & Iron Co., Ltd., Montreal, P. Q., Canada. (S.)
 Central Tube Co., Pittsburgh, Pa. (S.)
 Cohoes Rolling Mill Co., Cohoes, N. Y. (I., S.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (S.)
 La Belle Iron Works, Steubenville, Ohio. (S.)
 Midvale Steel & Ordnance Co., New York, N. Y. (I. & S. B. T.)
 Monongahela Tube Co., Pittsburgh, Pa. (I.; also I. & S. B. T.)
 National Tube Co., Pittsburgh, Pa. (S.; also S. B. T.)
 National Tube Co. (The), Lorain, Ohio. (S.; also S. B. T.)
 Page-Hersey Iron, Tube & Lead Co., Ltd., Toronto, Ontario, Canada. (I., S.)
 Parkesburg Iron Co., Parkesburg, Pa. (Char. I. B. T.)
 Reading Iron Co., Reading, Pa. (I.; also I. & S. B. T.)
 Republic Iron & Steel Co., Youngstown, Ohio. (S.)
 South Chester Tube Co., Chester, Pa. (I., S.)
 Spang, Chalfant & Co., Inc., Pittsburgh, Pa. (I., S.; also I. & S. B. T.)
 Steel & Tube Co. of America, Chicago, Ill. (S.; also S. B. T.)
 Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada. (S.)
 Superior Tube Co., Columbia, Pa. (I.)
 Tyler Tube & Pipe Co. (The), Washington, Pa. (I. & S. B. T.)
 Wheeling Steel & Iron Co., Wheeling, West Va. (S.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (I., S.)

MANUFACTURERS OF SEAMLESS STEEL TUBES.

(H.F.—HOT FINISHED. C. D.—COLD DRAWN).

Bordentown Steel & Tube Corporation, Bordentown, N. J. (C. D.)
 Delaware Seamless Tube Co., Auburn, Pa. (H. F., C. D.)
 Detroit Seamless Steel Tubes Co., Detroit, Mich. (H. F., C. D.;
 see Addenda.)
 Globe Seamless Steel Tubes Co., Milwaukee, Wis. (H. F., C. D.)
 Ivins' (Ellwood) Tube Works, Oak Lane Station, Philadelphia, Pa.
 (C. D.)
 National Tube Co., Pittsburgh, Pa. (H. F., C. D.)
 Ohio Seamless Tube Co. (The), Shelby, Ohio. (H. F., C. D.)
 Pittsburgh Seamless Tube Co., Beaver Falls, Pa. (H. F., C. D.)
 Pittsburgh Steel Products Co., Pittsburgh, Pa. (H. F., C. D.)
 Standard Seamless Tube Co., Pittsburgh, Pa. (H. F., C. D.)
 Summerill Tubing Co., Bridgeport, Pa. (C. D.)
 Timken Roller Bearing Co. (The), Canton, Ohio. (C. D.)

MANUFACTURERS OF WIRE NAILS.

- American Steel & Wire Co. (The), Cleveland, Ohio.
American Steel Co., Pittsburgh, Pa.
Angell Nail & Chaplet Co., Cleveland, Ohio.
Atlantic Steel Co., Atlanta, Ga.
Atlas Tack Corporation, Fairhaven, Mass.
Badger Nail Co. (The), Milwaukee, Wis.
Baker (Chas. F.), Inc., Boston, Mass.
Belfont Iron Works Co., Ironton, Ohio.
Cambria Steel Co., Philadelphia, Pa.
Canada Metal Co., Ltd. (The), Toronto, Ont., Canada.
Cedarburg Wire & Wire Nail Co., Cedarburg, Wis.
Central Wire Nail Co., Northumberland, Pa.
Clendenin Brothers, Baltimore, Md.
Cleveland Tack Works, Cleveland, Ohio.
Colonial Wire Mfg. Co., Ltd. (The), Montreal, P. Q., Canada.
Colorado Fuel & Iron Co. (The), Denver, Col.
Crawfordsville Wire & Nail Co., Crawfordsville, Ind.
Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada.
Ellwood City Nail Co., Ellwood City, Pa.
Gulf States Steel Co., Birmingham, Ala.
Hassall (John), Inc., Brooklyn, N. Y.
Igoe Brothers, Newark, N. J.
Illinois Nail Co. (The), Chicago, Ill.
Imperial Steel & Wire Co. (The), Collingwood, Ont., Canada.
Indiana Steel & Wire Co., Muncie, Ind.
Interstate Iron & Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Kelly Nail & Iron Co. (The), Ironton, Ohio.
Keystone Steel & Wire Co., South Bartonville, Peoria, Ill.
Kokomo Nail & Brad Co., Kokomo, Ind. (special; cement coated).
Kokomo Steel & Wire Co., Kokomo, Ind.
Laidlaw Bale Tie Co., Ltd. (The), Hamilton, Ont., Canada.
Maritime Nail Co., Ltd. (The), St. John, N. B., Canada.
Midvale Steel & Ordnance Co., New York, N. Y.
Milwaukee Tack Co., Milwaukee, Wis.
Morrisburg Tack Mfg. Co., Ltd., Morrisburg, Ont., Canada.
Morrison Steel & Wire Co., Ltd., Vancouver, B. C., Canada.
Northern Bolt & Screw Co., Ltd. (The), Owen Sound, Ont., Canada.
Northwestern Barb Wire Co., Sterling, Ill.
Norton Iron Works, Ashland, Ky.
Parmenter & Bulloch Co. (The), Gananoque, Ont., Canada.
Peck Rolling Mills, Ltd., Montreal, P. Q., Canada.
Pender (James) & Co., Ltd., St. John, N. B., Canada.
Penn Hardware Co., Reading, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Robertson (P. L.) Manufacturing Co., Ltd., Milton, Ont., Canada.

Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
Specialty Nail Co., Raynham, Mass.
Townsend Company, New Brighton, Pa.
United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., Canada.
Ward Nail Co., Struthers, Ohio.
Weatherproofing Nail Co. (The), Baltimore, Md. (idle).
Western Wire & Nail Co., London, Ont., Canada.
Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Corpn., Worcester, Mass. (see Addenda).
Wilson Steel Products Co., Chicago, Ill. (cement coated).
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF CUT NAILS.

Atlas Tack Corporation, Fairhaven, Mass. (small special nails).
Clendenin Brothers, Baltimore, Md.
Cleveland Tack Works (The), Cleveland, Ohio.
Cowan & Britton, Ltd., Gananoque, Ont., Canada (idle).
Diamond Tack & Nail Works, Boston, Mass.
Dominion Tack & Nail Co., Ltd., Galt, Ontario, Canada.
Holland Mfg. Co. (The), Baltimore, Md. (small special nails).
Kelly Nail & Iron Co. (The), Ironton, Ohio.
La Belle Iron Works, Steubenville, Ohio.
Milwaukee Tack Co., Milwaukee, Wis.
Morrisburg Tack Manufacturing Co., Morrisburg, Ont., Canada.
Norton Iron Works, Ashland, Ky.
Peck Rolling Mills, Ltd., Montreal, P. Q., Canada.
Portland Rolling Mills, Ltd. (The), St. John, N. B., Canada (idle).
Reading Iron Co., Reading, Pa.
Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
Tremont Nail Co., West Wareham, Mass.
United Shoe Machinery Co. of Canada, Ltd., Montreal, P. Q., Canada.
Van Alen & Co., Northumberland, Pa.
York Tack & Nail Works, York, Pa.

CARNEGIE LIBRARY OF PITTSBURGH



3 1812 03307 8354