





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

EIGHTEENTH EDITION CORRECTED TO JANUARY 1ST, 1916

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LETTER OF TRANSMITTAL.

HON. ELBERT H. GARY, PRESIDENT,

American Iron and Steel Institute, New York City.

DEAR SIR: Herewith is submitted a new Directory of Iron and Steel Works of the United States and Canada. This is a lineal successor of similar works published from time to time by the American Iron and Steel Association of Philadelphia under the general direction of Mr. James M. Swank. The preparation of this work has been in immediate charge of Mr. Howard H. Cook, Assistant Secretary of the Institute, assisted by Mr. William G. Gray and other members of the Institute staff.

Concerning this edition of the Directory Mr. Cook says:

The present edition of the Directory of Iron and Steel Works, as in previous editions, 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 to the Iron and Steel Works of the United States was published in 1908. So many changes in company organization and plant equipment have taken place since that time that it was necessary to re-write the entire book. In 1908, Canadian iron and steel works were listed and described in a separate publication entitled the "Canadian Supplement to the Directory." In the present revision, the Canadian plants have been incorporated in the general work.

Information concerning plant equipment not previously gathered has been included 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. Former editions gave only the size of the rolling mill. The present work states the type of mill, whether two-high or three-high, the number of stands, sets or housings, and whether roughing or finishing mills.

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 previous editions of the Directory, which had been found to be cumbersome, inconvenient and productive of frequent duplications and repetitions, has been entirely discarded and the companies are treated in this issue 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 certain rolled products, galvanized sheets, tin-plates and terne plates, cut and wire nails, and wrought pipe.

Historical connection with the previous editions 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.

It is hoped and believed that this Directory will be found even more comprehensive and more usable than any of its predecessors.

JAMES T. McCLEARY,
Secretary.

NEW YORK, MARCH 1, 1916.

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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.

Adams, The S. Jarvis, Co., name changed to Pittsburgh Iron and Steel Foundries Co., Aug. 12, 1912.

Adams, W. T., Corinth, Mississippi.

Birmingham Steel and Iron Works, Birmingham, Ala.: 1 B. O. H. fur. (10-ton) blt. 1904; f. o. Oct. 1, 1904. Fuel, prod. gas. (Formerly operated by Birmingham Steel and Iron Co. Property sold to W. T. Adams in 1913). *Long idle; for sale or lease.*

Adams Crucible Steel Works, Redington, Pa. Dismantled in 1909. see 1908 Directory, p. 261.

ADRIAN FURNACE CO., lessee, Dubois, Pa.

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

T. W. Kennedy, P., G. M., & P. A.; F. G. St. Clair, Sc. & A.; J. G. Miller, G. S. M.; at Dubois. L. W. Robinson, V. P.; at Punxsutawney, Pa. G. H. Clune, T.; at Rochester, N. Y. Brand: "Adrian."

Adrian Furnace, Dubois, Pa.: 1 stack, 80' x 19', blt. 1902-03; f. o. Aug. 10, 1903; 4 Julian Kennedy stoves, 80' x 22'; 3 steam blowing eng. (22,000 cfm.); 10 water-tube boilers, 2,500 H. P., slag gran. pit for slag sand, annual cap., 109,500 tons. Reynoldsville coke; Lake ore. (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.

Org. and inc. July 7, 1904. Capital stock: com. auth., \$40,000; issued, \$37,500.

G. B. M. Seager, P.; F. E. Kennedy, V. P.; J. H. Clark, Sc. & G. S. M.; A. M. Kells, T., G. M., & P. A.; Isaac Bassett, G. S.

Works at Adrian: blt. 1905; 5 6-pot crucible fur.; f. o. July 20, 1905. Fuel, oil. Machine shop for own use.

Product: steel castings for sale for automobile and small machinery work; also gray iron castings. Annual cap., 150 tons of crucible and 500 tons of gray iron castings.

Aetna Furnace, Aetna, Tenn., see J. J. Gray.

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

J. H. Pratt, P.; Benjamin S. Porter, Sc. & T.

Works at Southington: blt. 1872-73; 1 single puddling fur., 1 scrap fur., 3 busheling fur., 3 heat. fur., 3 trains (8", 10", 18"); fuel, coal.

Product: cold and hot punching nut shapes, merchant iron rounds, squares, half rounds, half ovals, ovals, machine-forged and hot-pressed nuts, horseshoe toe calks, and wrought-iron cross-arm braces; annual cap., 10,000 tons.

Aiken, Henry, Estate of, see Hydraulic Machine Co.

AJAX LEAD COATING CO. (The), Frankford Ave. & Richmond St., Philadelphia, Pa.

Est. 1888; inc., 1889. Capital stock: \$100,000.

J. G. Hendrickson, P.; G. H. Clamer, V. P.; J. R. Neison, Sc. & T.; J. C. Brightbill, P. A.

Selling agents:

Chicago, Marquette Bldg., John G. Miller.

New York, 90 West St., A. MacDougall.

Pittsburgh, Jenkins Arcade Bldg., H. L. Carpenter.

Washington, D. C., Munsey Bldg., Raymond Pilson.

Works at Frankford Ave. & Richmond St., Philadelphia: blt. 1889 for coating iron or steel sheets with pure lead and Ajax anti-rust sheets which have base of steel, iron, American ingot iron, Toncan metal, etc., as ordered, and are coated first with zinc and then with lead.

AKRON STEEL CASTING CO. (The), 730 Carroll St., Akron, Ohio.

Org. and inc. April, 1913. (Owned and operated by The Adamson Machine Co.; acquired Aug., 1914).

Alex. Adamson, P. & G. M.; W. E. Slabaugh, V. P.; R. B. Koontz, Sc. & T.; Carl Fenn, A.; J. W. Tyrrell, P. A.

Works at Akron: 2 Tropenas converters (2-ton): 1 cupola; f. o. July 7, 1913; bldg. 10-ton B. O. H. fur. (to be completed in April, 1916). Fuel, coke.

Product: steel castings for sale for rubber and clay working machinery, annual cap., 600 tons converter, and 1,500 tons open hearth castings.

Alabama and Georgia Iron Co.; see 1908 Directory, p. 344; sold Cherokee Furnace and iron ore properties to Cedartown Iron Co. Nov. 28, 1910 and dissolved.

ALABAMA CO. (The), First National Bank Bldg., Birmingham, Ala.

Branch office: Munsey Trust Bldg., Baltimore, Md. Inc. June, 1913. Capital stock: com. \$2,000,000; pref. \$2,100,000; bonds, \$3,008,000.

J. William Middendorff, P.; J. E. Whitney, Sc.; at Baltimore, Md. H. W. Coffin, 1 V. P.; J. W. Porter, A. T. & G. S. A.; W. J. Davis, A.; W. E. Leake, G. M.; F. C. Morgan, C. E.; E. B. Heiser, P. A.; at Birmingham, Ala. Berkley Williams, 2 V. P.; at Richmond, Va.

Selling agents: Hickman, Williams & Co., for Chicago, Cincinnati, Louisville, and St. Louis territory; Tuffli Bros. Pig Iron and 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.); 19 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, 86' x 19'; 4 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 Gadsden 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 and ore washers.

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

The company acquired 32,211 acres of coal and timber land from the Standard Coal Co. There are now 915 bee-hive 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 bee-hive 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.

Alabama Consolidated Coal and Iron Co., see 1908 Directory, p. 205, reorganized under the name of the Alabama Co., June, 1913.

Alabama Tube and Iron Works, Helena, Ala., E. H. Thornton, owner, see 1908 Directory, p. 350. Purchased by Connors-Weyman Steel Co. in June, 1908, and pipe mill dismantled.

ALAN WOOD IRON AND STEEL CO., Widener Bldg., Philadelphia, Pa.

Richard G. Wood, P.; Jonathan R. Jones, V. P. & T.; W. W. Lukens, Sc. & A. T.; Howard Wood, Jr., A. Sc. & A. T.; D. P. Sailer, A.; Alan D. Wood, P. A.

Sales offices:

Boston, 141 Milk St.

Cleveland, 1321 Rockefeller Bldg.

Dallas, Tex., 915 Busch Bldg.

New York, 50 Church St.

San Francisco, 461 Market St.

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

Product: basic, mill and foundry pig iron, steel ingots, alloy steel ingots, billets and slabs, muck bar, universal and sheared plates (boiler, ship, tank, bridge, etc.), blue annealed and red steel plates, floor plates, checkered plates, etc.; black sheets, special stamping sheets, etc.; bar iron and steel.

Swede Furnaces, Swedeland, Pa.: 2 stacks. No. 1, blt. 1850, last rebt. 1905, 80' x 18', 3 Roberts fire-brick stoves, 80' x 20', 1 centre combustion Kennedy stove, 90' x 20'; No. 2, blt. 1890-91; dismantled, 1914; No. 3, blt. 1910-12, f. o. Apr. 25, 1912, 85' x 22' (thin-lined), 4 Roberts stoves, 100' x 21'; 3 steam blowing eng. (123,000 cfm.); 17 water-tube boilers, 3,400 H. P.; 2 Uehling casting machines. Coke; Lake and foreign ore. Molten metal to mixer at Ivy Rock Steel Works. Machine shop for own use. Installing a Dwight & Lloyd sintering plant to be completed about May 1, 1916, annual cap., 45,000 to 90,000 tons—according to materials sintered. (Formerly owned by Richard Heckscher and Sons Co.; acquired by Alan Wood Iron & Steel Co., Dec. 1, 1911). Product: basic, and mill pig iron, annual cap., 275,000 tons.

Ivy Rock Steel Works, Ivy Rock, 1 mile north of Conshohocken, Pa.: blt. 1902-03; 9 B. O. H. fur. (55-ton); 1 mixer (300-ton); 5 4-hole soaking pits; 51 gas prod.; first O. H. steel made May 31, 1903; 5 4-d. gas heat. fur.; 3 trains (35" 2-h. 1-st. blooming; 38" universal mill, interchangeable with blooming mill; plate mill with 1 roughing and 1 finishing stand, each 30" x 84"). Machine shop for own use. Adding 3 75-ton B. O. H. fur.; annual cap., 125,000 tons.

Product and annual cap.: 325,000 tons ingots, 275,000 tons billets and slabs, universal plates; 100,000 tons of sheared plates.

Schuylkill Iron Works, Conshohocken, Pa.: blt. 1857; 9 double puddling fur.; 5-ton steam hammer; 1 squeezer; 12 coal-fired heat. fur. (10 2-d. 2 3-d); 1 pair and 3 sheet fur.; 11 hot trains (two 3-h. 1-st. muck mills; 5" 2-h. 1-st. bar; five 3-h. sheared plate mills, two 26" x 72", two 24" x 54", one 24" x 48"; 3 black sheet mills, one 22" x 48", two 22" x 42"); 2 single-stand cold

mills, 24" x 48", 22" x 42"; 7 open annealing fur.; 2 box annealing fur.; 2 pickling tanks. Fuel, bit. coal, coke and producer gas. Machine shop for own use. Product and annual cap.: 11,000 tons muck bar, 15,000 tons bar iron and steel, 60,000 tons sheets and plates, flue iron and steel, and rolled floor plates.

ALBERTA ROLLING MILLS CO., LTD. (The), Medicine Hat, Alberta, Canada. Org. and inc. 1910. Capital stock: com. \$150,000, bonds \$22,000.

J. L. Pollock, P. & G. M.; J. Willoughby, V. P.; at Winnipeg, Manitoba. William Crawford, Sc. & T.; Samuel Davis, G. S.; W. T. Scilley, P. A.; at Medicine Hat, Alberta.

Selling agent: Calgary, Alberta, E. H. Telfer.

Works at Medicine Hat, Alberta: blt. 1911; f. o. Dec. 1, 1911; 3 pile fur.; 2 trains (9" 3-h. 5-st., 18" 3-h. 2-st). Fuel, nat. gas. Machine shop for own use. Bolt and nut factory.

Product: bar and band iron, and reinforcing steel, annual cap., 6,000 tons.

ALCANIA CO. (The), 701 German National Bank Bldg., Pittsburgh, Pa. Inc. Sept. 3, 1901. Capital stock: com. auth. \$250,000, issued \$164,500.

W. H. R. Hilliard, P.; M. M. Garland, V. P.; Oliver Wylie, Sc. & T. Brand: "Avon."

Works at Avonmore, Pa.: blt. 1899, f. o. Sept. 12, 1899; 1 2-d. bar heat. fur., 1 2-h. 1-st. bar mill; 3 pair and sheet fur.; 3 black sheet mills, blt. 1898, f. o. April 12, 1899, 2 28" x 32", 1 28" x 34"; 3 single st. cold mills, 26" x 32"; 2 box annealing fur.; 1 pickling machine. Tinplate dept.: 6 Thomas & White sets, 5 for tinplates and 1 for terne plates; weekly cap., 2,000 boxes of tinplates and 700 boxes of terne plates. Fuel, bit. coal. Machine shop for own use. *Last active in 1910.*

Product and annual cap.: black plates for tinning (7,500 tons), tinplates and terne plates (135,000 base boxes).

Algoma Steel Co., Ltd., see Canadian Supplement, p. 11, merged in Algoma Steel Corpn. in 1912.

ALGOMA STEEL CORPORATION, Sault Ste. Marie, Canada.

Org. and inc. 1912. Capital stock: com. \$15,000,000; pref. 7% cum. \$10,000,000; bonds, \$16,432,500; bonds of subsidiaries, \$526,000. The entire capital stock is owned by the Lake Superior Corporation.

J. Frater Taylor, P. & G. M.; Simon S. Martin, V. P.; W. C. Franz, V. P.; F. Martin Turnbull, C.; James Hawson, T.; at Sault Ste. Marie. Herbert Coppell, V. P.; at New York City. Alex. Taylor, Sc.; at Toronto.

Brand: "Algoma."

Product: pig iron, ingots, blooms, billets, rails, light rails, angles, beams, channels, splice bars, tie plate bars, merchant bars, railway spikes, bolts and nuts.

The Algoma Steel Corporation was formed in 1912 to consolidate certain subsidiaries of the Lake Superior Corporation including the Algoma Steel Co., Algoma Commercial Co., Algoma Iron Works and Lake Superior Power Co.

Algoma Steel Works, Sault Ste. Marie.

Blast Furnaces: 3 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 15' 6"; No. 3, blt. 1909-11, f. o. April 13, 1911, 90' x 21' 6"; 7 Foote stoves, 70' x 18', 4 Kennedy stoves, 97' x 22'; 1 Adamson-Rateau mixed pressure turbine direct-connected to 1,500 K. W. generator, 9 2,200 H. P. 4-cylinder twin tandem gas engines, 4 with blowing tubs, 5 direct-connected to 1,500 K. W. generators furnish power to docks and mills; 2 double-strand casting machines. Molten metal to mixers. By-product coke; Michipicoten and Lake ore. Product: Bessemer and basic pig iron, annual cap., 350,000 tons. By-product coke plant: 110 Koppers by-product ovens, annual cap., 432,000 net tons of coke. By-product recovery plant and sulphuric acid plant, annual cap., 21,600 tons tar, 5,400 tons sulphate of ammonia. Surplus gas, 7,500,000 cu. ft. per day.

Open hearth dept.: 7 stationary B. O. H. fur. (2 40-ton, 3 45-ton, 2 50-ton); mixer (300-ton); first O. H. steel made May 3, 1907. Annual cap., 240,000 tons.

Bessemer dept.: 2 Bessemer converters (5-ton); 4 cupolas; mixer (150-ton); first Bessemer steel made May 5, 1902; annual cap., 270,000 tons ingots.

Adding one 20-ton Bessemer converter and 1 B. O. H. fur. (200-ton tilting) to be used for duplexing.

Rolling mill dept.: 5 4-hole soaking pits; 3 gas-fired regen. re-heat. fur.; 35" 2-h. 1-st. reversing blooming; rail mill with 23" 3-h. 1-st. roughing, 23" 3-h. 1-st. intermediate, 28" 3-h. 1-st. finishing; 18" and 12" merchant mills. Rail finishing shop.

Rail fastenings dept. for finishing tie plates, splice bars and the manufacture of railway spikes, bolts and nuts. Keg factory.

Annual cap., 230,000 tons rails, 105,000 tons merchant bars, angles, etc.

Auxiliary depts.: machine shop, foundry, forge, boiler shop, frog and switch shop, pattern shop. Yard railways with 32 miles track, 13 standard and 5 narrow gauge locomotives, 84 steel cars, 7 locomotive cranes.

Water Power Dept., formerly operated by Lake Superior Power Co., has 1 electric fur. blt. 1906, f. o. April, 1906, formerly used for making ferro-nickel and ferro-silicon. Idle since 1912. One electric fur. blt. 1899, dismantled in 1906.

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 Fiborn quarry, a producing operation in upper Michigan.

Coal properties : The company owns the entire capital stock of the Cannelton 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 Pocahontas coal in McDowell Co., W. Va., with present daily production of about 1,500 tons.

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

Org. and inc. Mar., 1902. Capital stock (all owned by the Lukens Iron and Steel Co.); com. auth. \$2,000,000, issued, \$1,225,000; pref. auth. \$1,000,000, issued, \$875,000; bonds, \$26,000.

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

Sales agents: Rogers, Brown & Co.

Brands: "Alleghany" and "Buena Vista."

Product : high-manganese foundry, forge, basic, and special car-wheel pig iron.

Plants and properties : Furnaces and properties were operated under lease by the Oriskany Ore and Iron Corporation from July 1, 1908, to June 28, 1911, except Buena Vista Furnace, the lease of which was extended to Oct. 31, 1911; all furnaces are now operated by the Alleghany Ore and Iron Co.

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; 1 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 Craig Creek.

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; specialty, chill-cast pig iron for car wheels, annual cap., 36,000 tons.

Gem Furnace, Shenandoah, Va. : 1 stack, 70' x 16', blt. 1882, f. o. Feb. 8, 1883; remod. 1889 and 1891; 3 Whitwell stoves; 2 steam blowing eng. (28,000 cfm.); 6 cylindrical boilers, 750 H. P. Pocahontas coke; brown hematite ore, mined on the furnace property. *Last active in 1907.*

Product: foundry, forge, and basic pig iron, annual cap., 36,000 tons.

Total annual capacity of the 3 furnaces: 102,000 tons.

The company owns and operates the Oriskany iron-ore mine at Oriskany and Lignite, the Reid mine at Oriskany, and the Mary Creek mine at Vesuvius, Va. The annual cap. of these mines is about 150,000 tons. It also operates under lease on a royalty basis a limestone quarry at Bells Valley, Rockbridge county, owned by S. M. Davidson, with an annual cap. of about 25,000 tons.

ALLEGHENY STEEL CO., Oliver Bldg., Pittsburgh, Pa.

Org. and inc. May, 1905. Capital stock: com. auth. \$3,500,000, issued \$3,023,200; bonds \$635,000.

Harry E. Sheldon, P.; Lewis W. Hicks, V. P.; R. D. Campbell, Sc. & T.; at Pittsburgh. F. H. Stephens, A. Sc. & A.; W. L. Walker, G. M.; O. B. Lindquist, G. S.; C. C. Henderson, A. T. & G. S. M.; E. L. McGraw, P. A.; at Brackenridge, Pa.

Sales offices: McCormick Bldg., Chicago; 90 West St., New York; 602 Pennsylvania Bldg., Philadelphia; 1100 Third National Bank Bldg., St. Louis.

Allegheny Steel Works, Brackenridge, Pa.: blt. 1900-01; 6 B. O. H. fur. (45, 55, 75, 80, 80, 85-ton); 2 4-hole soaking pits; 1 cont. heat. fur.; 4 ingot and slab heat. fur.; 17 pair and sheet fur.; 29" 3-h. 1-st. bar; 30" x 100" 3-h. sheared plate mill; 17 black sheet mills, from 22" x 36" to 30" x 60"; 13 single-stand cold mills, from 22" x 40" to 26" x 60"; 17 box annealing fur.; 2 pickling mach.; 1 pickling tank; 2 galvanizing pots, annual cap., 12,000 tons. Tube dept.: annual cap. 20,000 tons lap welded iron and steel pipe and boiler tubes, 1 1/4" to 7" dia. Plate washer dept., annual cap. 1,500 tons of steel plate washers, 3/8" to 2". Pressed steel dept. for blanking or pressing heavy steel sheets and light steel plates, annual cap. 4,000 tons. Steel foundry, annual cap., 7,000 tons castings for sale and for own use.

Product: ingots, billets, sheet bars, tank and boiler plates, black and galvanized iron and steel sheets, iron and steel boiler tubes, casing and line pipe, steel washers, hot pressed plate and sheet specialties, and steel castings. Annual cap., 180,000 tons of ingots, 60,000 tons sheared plates, 70,000 tons black sheets, 20,000 tons steel and iron tubes, 7,000 tons steel castings, 12,000 tons galvanized sheets, 4,000 tons pressed steel, 15 tons plate washers.

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

Org. Aug., 1908; inc. Mar. 8, 1910. Capital stock: \$10,000.

J. K. Bowen, P.; C. E. Winters, Sc.; H. B. Weaver, T. & G. M.

Selling agents: Rogers, Brown & Co.

Brand: "Weaver."

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.; crush slag for road metal, etc. Charcoal; local brown hematite ore. Product: cold-blast charcoal pig iron, annual cap., 3,000 tons.

Allentown Rolling Mills (The), Allentown, Pa., see 1908 Directory, p. 259. Two blast furnaces; dismantled in 1912-13.

Allison, J. Wesley, Morrisburg, Ontario, Canada.

C. W. MacLean and J. Wesley Allison, owners.

Works at Morrisburg: blt. 1906-07; first rolled products, Dec. 17, 1907; 8 heat. fur.; 4 hot black sheet mills 26"; 4 cold mills, 22"; galvanizing dept. Tin house: 4 sets for tin and terne plates. (Formerly owned by Canada Tin Plate and Sheet Steel Co., Ltd.; acquired by Canadian Sheet Steel Corp., Ltd., in 1909; acquired by present owners in 1912).

Product and annual cap.: 12,500 tons of black plates for tinning or black sheets, 125,000 base boxes tinplates. *Last active in 1911, for sale or lease.*

Alloy Steel Casting Co., Wheeling, W. Va., see 1912 Supplement, p. 36, blt. open hearth steel casting plant at Glenova, W. Va., in 1911. Plant acquired by the Wheeling Steel Casting Co., July 1, 1913.

Alton Steel Co., Alton, Ill., was inc. 1912 and blt. steel works and rolling mill at Alton, Ill., in 1913. James Duncan was appointed receiver July 8, 1914. Receivership terminated June 29, 1915, when the property was purchased by W. C. Fownes and associates. The property was purchased in December, 1915, by the Laclede Steel Co.

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

Org. May 18, 1872; inc. July 10, 1873. 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.; 5 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); 1 3-ton drop ham. Fuel, bit. coal. Machine shop for own use.

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.

American Aluminum Coating Co., see The Wilder Metal Coating & Mfg. Co.

AMERICAN BRAKE SHOE AND FOUNDRY CO., Mahwah, N. J. ;
executive offices, 30 Church St., New York.

Org. and inc. Jan. 29, 1902. Capital stock : common auth. \$5,000,-000, issued \$4,600,000 ; pref. 8% cum. auth. and issued \$5,000,000. Gates W. McGarragh, Ch. ; Otis H. Cutler, P. ; Joseph D. Gallagher, V. P. ; William G. Pearce, V. P. ; at New York. Joseph B. Terbell, V. P. and Edward S. Moore, V. P., at Chicago. Henry C. Knox, Sc. & T., George C. Ames, C. ; at Mahwah.

Product : brake shoes for steam and electric cars and iron castings. The company operates the following works for the manufacture of brake shoes and iron castings. The Chattanooga and Mahwah works are equipped with crucible furnaces for the manufacture of carbon and alloy steel inserts for own use in the manufacture brake shoes.

Works.	Location.	Annual Capacity. Gross Tons.
Boston Works	Norwood, Mass.	10,500
Buffalo Works	Buffalo, N. Y.	21,000
Burnside Works	Chicago, Ill.	16,500
Chattanooga Works	Chattanooga, Tenn.	27,000
Chicago Works	Chicago, Ill.	30,000
Cincinnati Works	New Richmond, Ohio.	7,500
Mahwah Works	Mahwah, N. J.	31,500
Melrose Park Works	Melrose Park, Ill.	31,500
Twin City Works	Minneapolis, Minn.	8,000
Uniontown Works	Uniontown, Pa.	18,000
Total cap. of 10 works.....		201,500

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

Org. and inc. May 12, 1900.

Subsidiary of the United States Steel Corporation.

August Ziesing, P. ; William H. Connell, T. ; Frank B. Thompson, A. ; W. G. A. Millar, P. A. ; at Pittsburgh. Joshua A. Hatfield, V. P. ; H. Schoonmaker, Sc. ; at 30 Church St., New York City.

Sales offices :

Baltimore, Continental Trust Bldg.
 Boston, John Hancock Bldg.
 Buffalo, Marine National Bank Bldg.
 Chicago, 208 S. LaSalle St.
 Cincinnati, Union Trust Bldg.
 Cleveland, Rockefeller Bldg.
 Denver, Col., First National Bank Bldg.
 Detroit, Beecher Ave. and M. C. R. R.
 Duluth, Minn., Wolvin Bldg.
 Minneapolis, Minn., 7th Ave. & 2d St., S. E.
 New York City, 30 Church St.
 Philadelphia, Widener Bldg.

Rochester, N. Y., Powers Block.

Salt Lake City, Walker Bank Bldg.

St. Louis, Third National Bank Bldg.

St. Louis, 1014 South Vandeventer Ave.

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

Brand: "Pencoyd."

Product: manufacture and erect railroad and highway bridges, steel buildings, barges, turntables, etc.; O. H. 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.; also makes bolts, nuts, rivets, washers, spikes, etc.

The American Bridge Co. operates the following works for the manufacture and erection of railroad and highway bridges, steel buildings, turntables, towers, eye-bars, etc., total annual capacity, 733,000 net tons. Connected with the Pencoyd Plant there are steel works, rolling mills and iron foundry. (At the Ambridge Plant there is a steel and iron foundry) Total annual capacity, 240,000 gross tons of ingots, 11,800 gross tons of steel castings, 9,000 net tons iron castings, and 220,000 gross tons of finished rolled products. All the plants are equipped to make rivets.

Ambridge Plant, Ambridge, Pa. Bridge works for steel bridges, buildings and other structures, and yard for building steel barges and steamboat hulls (158,000 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; 1 A. O. H. fur. (15-ton). Fuel, natural gas. Annual cap., 8,600 gross tons of steel castings for own use and for sale. Gray iron foundry (6,000 net tons). Bolt, nut and rivet shop (11,000 net tons).

American Plant, 40th and Stewart Ave., Chicago. Bridge works (27,600 net tons). Forge shop (1,200 net tons).

Canton Plant, Dueber Ave. and Bridge St., Canton, Ohio. Bridge works, (9,600 net tons).

Detroit Plant, Beecher Ave. and M. C. R. R., Detroit, Mich. 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 (120,000 net tons). Forge shop, all kinds of iron and steel forgings (6,000 net tons).

Lassig Plant, Clybourn and Wrightwood Aves., Chicago. Bridge works (43,200 net tons).

Minneapolis Plant, Seventh Ave. and Second St., Southeast, Minneapolis, Minn. Bridge works (12,000 net tons).

Pencoyd Plant, Pencoyd, Pa. Steel works: blt. 1887; enl. since; 11 B. O. H. fur. (7 30-ton; 4 35-ton). Annual cap., 240,000 gross

tons of ingots. Rolling mill: blt. 1852; 4 open-top soaking pit fur., 1 pit to each fur.; 5 heat. fur. (1 5-d., 1 6-d., 1 7-d. and 1 cont. gas-fired, 1 cont. coal-fired); 5 trains (36" 2-h. 1-st. blooming, 28" 2-h. 1 st. roughing, 23" 3-h. 2-st. finishing, 23" 3-h. 3-st. finishing, and 12" with 4-st. 3-h. and 3-st. 3-h. finishing); 5 steam hammers (500, 500, 500, 500, 2,500-lb.); 3 hydraulic forging presses (75, 300 and 300-ton). Fuel, bituminous coal. Product: channels 2" to 15", beams 3" to 20", deck beams 5" to 8", tees 1" to 6" x 5¼", angles 1" to 8", flats 1" to 16" wide, rounds 5/8" to 7" diameter, bar and bridge steel, shafting and blooms; annual capacity, 220,000 gross tons of finished rolled products.

Machine shop for jobbing and own use.

Bridge works (108,000 net tons). Foundry for general castings for own use and for sale, annual cap., 3,200 gross tons of steel, 3,000 net tons of iron and 100 net tons of brass castings.

St. Louis Plant, 1014 So. Vandeventer Ave., St. Louis, Mo. 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 electric transmission (9,600 net tons).

Toledo Plant, East Broadway and L. S. & M. S. Ry., Toledo, Ohio. Bridge works (31,200 net tons).

Trenton Plant, foot of Warren St., Trenton, N. J. Bridge works (36,000 net tons). Building a barge yard, to be completed about May 1, 1916.

American Can Co. Tinplate Works at Baltimore, Md., see 1908 Directory, p. 473, have been dismantled.

AMERICAN CAR AND FOUNDRY CO., 165 Broadway, New York; Syndicate Trust Bldg., St. Louis; Railway Exchange Bldg., Chicago. Org. and inc. 1899. Capital stock: com. \$30,000,000; pref. 7% non-cum. \$30,000,000.

W. H. Woodin, P.; William C. Dickerman, Clarence Price, V. P.; William M. Hager, Sec.; S. S. DeLano, T.; at New York. J. M. Buick, V. P.; Nicholas A. Doyle, A.; W. E. Hedgcock, P. A.; at St. Louis. Herbert W. Wolff, V. P.; at Railway Exchange Bldg., Chicago. District managers: Berwick, Pa., W. F. Lowry; Chicago, Frank Thompson; Huntington, W. Va., John W. Ensign; Jeffersonville, Ind., W. R. Mason; St. Charles, Mo., J. G. Lawler; Detroit, Joseph G. Johnston; St. Louis, T. A. Dooley; Wilmington, Del., Charles S. Gawthrop; Memphis, Tenn., Charles A. Price.

Resident representatives: Buffalo and Depew, N. Y., W. H. Sanford, Buffalo; Milton, Pa., B. B. Cannon; Terre Haute and Indianapolis, Ind., R. L. Fogleman, Terre Haute.

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 (125,000 freight, 1,850 passenger); chilled cast-iron wheels for locomotives and cars (1,500,000); gray iron and malleable castings (108,000 tons); rolled and hammered iron and steel car axles; all kinds of railroad, steamboat, and machinery forgings; bolts, nuts and rivets; brass castings; cast-iron gas and water pipe; merchant bars, axles, shafts, links and pins.

The company operates the carbuilding works listed below. The products made at each plant are stated and the annual capacity given in parentheses. It operates four rolling mills (total annual cap., 240,000 tons rolled products) see below under Berwick Plant, Detroit Forge Dept., Madison Rolling Mill and St. Louis Rolling Mill. The Helmbacher and Madison Plants of the Helmbacher Forge and Rolling Mills Co. were acquired Feb. 1, 1912. The Milton Rolling Mill and Forge, Milton, Pa., see 1908 Directory, page 221, has been abandoned.

Berwick Plant, Berwick, Pa. (Formerly called Jackson & Woodin Works): blt. 1872; 10 double puddling fur.; 6 heat. fur. (2 3-d., 4 4-d. coal-fired); 4 trains (18" 3-h. 2-st. muck, 12" 3-h. 5-st. guide, 9" 3-h. guide with 4-st. 9" and 1-st. 12", 18" 3-h. bar with 3 3-h., 1 2-h. st.) Fuel, bituminous coal. Product: merchant bar iron, annual cap., 50,000 tons; straight rolled iron and steel car axles, annual cap., 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 $\frac{7}{8}$ "; cast iron pipe, 3" to 16" (15,000 tons).

Bloomsburg Plant, Bloomsburg, Pa. Product: wooden and steel-underframe freight cars (3,000).

Buffalo Plant, Buffalo, N. Y. Formerly called Buffalo Car Works and Niagara Car Wheel Works. 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. (Formerly called Wells and French Works). Product: wooden and steel-underframe freight cars (12,000); chilled cast-iron car wheels (250,000); gray iron castings (15,000 tons); bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (2,000 tons for sale).

Depew Plant, Depew, N. Y. (Formerly called Union Works). Product: wooden and steel-underframe freight cars (10,000); bolts $\frac{1}{2}$ " to 2"; light railroad forgings (3,000 tons for sale). Operated at present for repair work only.

- Detroit Plant, Detroit, Mich. (Formerly called Michigan-Peninsular Works). Product: wooden and steel freight cars (30,000); chilled cast-iron car wheels (240,000); gray iron castings (30,000 tons); bolts $\frac{3}{8}$ " to 2"; light railroad forgings (4,000 tons for sale).
- Detroit Forge Department, Detroit, Mich. (Formerly called Michigan-Peninsular Works): forge blt. 1870; rolling mill, 1877; rebt. 1892 after fire; 4 4-d. coal-fired heat. fur.; 7 coal-fired busheling fur.; 3 trains (20" 3-h. 2-st., 16" 3-h. 3-st., 12" 3-h. 6-st.). Fuel, coal. Product: merchant bar iron, annual cap., 60,000 tons. Also produce cast iron pipe, 4" to 42" (15,000 tons).
- Gary Plant, Gary, Ind. Proposed steel carbuilding plant.
- Huntington Plant, Huntington, W. Va. (Formerly called Ensign Works). 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 railroad forgings (1,500 tons for sale).
- Indianapolis Plant, West Indianapolis, Ind. (Formerly called Indianapolis Works). Now used for repairing freight cars only. Product: gray iron castings (6,000 tons); bolts $\frac{3}{8}$ " to 2"; light railroad forgings (1,000 tons for sale).
- Jeffersonville Plant, Jeffersonville, Ind. (Formerly called Ohio Falls Works). 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. (Formerly called Madison Car Works). 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. (Formerly called Madison Plant and operated by Helmbacher Forge and Rolling Mills Co.). Blt. 1900-1, rebt. 1902 after fire; 4 4-d. direct coal-fired heat. fur.; 9 busheling and puddling fur. (3 1-d. sand bottom, 1 1-d. cinder bottom, 5 2-d. cinder bottom), 1 pile fur.; 3 trains (20" 3-h. 2-st. muck, 16" 3-h. 3-st. bar, 9" 3-h. 4-st. guide with 14" Belgian roughing). Fuel, bituminous coal. Product: merchant bar and guide iron, annual cap., 60,000 tons.
- 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 $\frac{1}{2}$ " to 1"; light railroad forgings (3,000 tons for sale).
- Milton Plant, Milton Pa. (Formerly called Milton Car Works). Product: wooden and steel-underframe freight cars (4,500); bolts $\frac{3}{8}$ " to 2"; light railroad forgings (500 tons for sale). Specialty: tank cars (4,000).
- 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. (Formerly called Missouri Car and Foundry Works). 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, South Second St., St. Louis, Mo. (Formerly called Helmbacher Plant and operated by Helmbacher Forge and Rolling Mills Co.). Blt. 1858; 2 single and 3 double puddling fur., 6 busheling (3 1-d. and 3 2-d.); 2 pile; 4 4-d. heat. fur.; 3 trains (18" 3-h. 2-st. muck, 18" 3-h. 3-st. bar, 10" 3-h. 5-st. guide). Fuel, coal. Product: bar, rod, and band iron, annual cap., 60,000 tons of rolled products.

Terre Haute Plant, Terre Haute, Ind. Product: wooden and steel-underframe freight cars (9,000); chilled cast-iron car wheels (75,000); gray iron castings (7,500 tons); bolts, $\frac{3}{8}$ " to 2"; light railroad forgings (1,000 tons for sale).

Wilmington Plant, Wilmington, Del. (Formerly called Jackson and Sharp Works). 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, residences and office buildings.

American Duplex Steel Co. Works at Bradford, Pa., idle for many years and abandoned, see 1908 Directory, p. 311.

American Electric Furnace Co., 45 Wall Street, New York City.

Works at Niagara Falls, Ont., Canada.: blt. 1907-8, dismantled 1910. Company dissolved March 25, 1913.

AMERICAN ELECTRICAL WORKS, Phillipsdale, R. I.

Frank N. Phillips, P.; Eugene R. Phillips, V. P.; C. H. Wagen-seil, T.; C. R. Remington, Sc. & G. 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 Falls Electric Smelting and Refining Co., Pocatello, Idaho. Projected plant abandoned. See 1908 Directory, p. 402.

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:

Chicago, Ill., 713 Fischer Bldg.

New Orleans, La., 712 Union St.

New York City, 50 Church St.

Pittsburgh, Pa., 1101 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 HORSE SHOE CO., Phillipsburg, N. J.

Org. and inc. April, 1895. Capital stock : \$500,000.

Philip S. Dyer, P. & T. ; E. R. Yarnelle, 1 V. P. & G. S. M. ; C. H. Holton, 2 V. P. ; Thomas F. Tighe, Sc. & P. A. ; C. G. Shirer, G. S.

Brand : letter "A" in a circle.

Works at Phillipsburg, N. J. ; telegraph address, Easton, Pa. : blt. 1865 ; acquired by present owners, 1895 ; 17 heat. fur. (12 3-d. and 5 4-d. coal-fired) ; 4 trains (three 9" 3-h. 3-st., one 18" 3-h. 1-st.). Fuel, coal.

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

AMERICAN IRON AND STEEL MANUFACTURING CO., Lebanon, Pa.

Inc. Sept. 1, 1899. Capital stock : com. \$2,550,000 ; pref. 5% cum. \$3,000,000.

James Lord, P. ; John Penn Brock, V. P. ; D. G. Scott, Sc. ; H. M. M. Richards, T.

Selling agents :

Atlanta, Candler Bldg.

New York, Whitehall Bldg.

Boston, Oliver Bldg.

Philadelphia, Harrison Bldg.

Chicago, McCormick Bldg.

San Francisco, Monadnock Bldg.

Registered trade marks : the letter "A" in a triangle as a general trade mark : letter "A" forged on bolts, letter "S" forged on boiler rivet-heads, "S" in a circle forged on structural rivets.

Product : ingots, billets and muck bars for own use ; staybolt iron, engine bolt iron, double refined iron, merchant bar iron and steel, rounds ($\frac{3}{8}$ " to 5"), squares ($\frac{3}{8}$ " to $4\frac{1}{2}$ "), flats ($\frac{1}{2}$ " x $\frac{3}{16}$ " to 8" x 2"), half ovals, half rounds, round-edge flats, etc. ; bolts, nuts, boiler and structural rivets, washers, railway track bolts, railway track spikes (plain and screw), turnbuckles, clevises, pole line material, rods, punched plates, straps, forgings.

Lebanon Works, Lebanon, Pa. : O. H. Dept. blt. 1913-15, f. o. Aug., 1914 ; 4 B. O. H. fur. (50-ton) ; 2 Frick electric fur. (20-ton) : 30" 3-h. 1-st. billet mill. Rolling Mill Dept. : 33 double puddling fur. ; 18 heating fur. ; 20" 3-h. 3-st. muck ; 20" 3-h. 2-st. muck ; 20" 3-h. 2-st. muck ; 16" 3-h. 4-st. bar ; two 12" 3-h. 5-st. guide ; two 10" 3-h. 5-st. guide ; 8" 3-h. 5-st. guide ; 18" to 12" tandem 3-h. 8-st. bar and guide ; 12" to 9" tandem 3-h. 6-st. guide ; 12" to 8" tandem 3-h. 6-st. guide. Fuel, pulverized coal. Bolt, nut and rivet works. Forge shop, annual cap., 5,000 tons. Gray iron and brass foundry, annual cap., 2,000 tons. Galvanizing

dept.: 3 galvanizing pots, annual cap., 5,000 tons. Keg factory for kegs, boxes and barrels. Annual cap.: 75,000 tons of electric and open-hearth ingots, 125,000 tons of bar iron and steel.

Reading Works, Reading, Pa.: 6 heat. fur.; 10" 3-h. 3-st. guide; tandem 12" to 9" 3-h. 6-st. guide; tandem 18" to 10" 3-h. 6-st. guide. Fuel, pulverized coal. Bolt, nut and rivet dept. Keg factory. Annual cap., 45,000 tons merchant bar iron and steel.

American Iron Mills Co., see Western Iron Mills Co.

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

Howard Morris, P.; Minard Lister, Sc.; E. J. Tapping, T. & G. M. Product: renewed steel rails by the McKenna process.

Joliet Plant (owned), Joliet, Ill.: blt. 1897; f. o. Aug. 11, 1897; 2 4-d. coal-fired reverb. heat. fur.; 2 trains (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; 2 5-d. heat. fur.; 2 trains (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; 3 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., Bullitt Bldg., Philadelphia, Pa.

Inc. Dec. 31, 1913; org. Mar., 1914. Capital stock: com. auth., \$6,000,000, issued, \$4,749,935; pref. 6% cum. auth., \$6,000,000, issued, \$3,810,590; bonds, \$1,243,000.

Edward E. Marshall, P.; Reiner Hoch, Sc.; William E. Arnold, A. T.; at Philadelphia. William H. Locker, T.; at Duluth, Minn.

Selling agents: Shimer & Co., Inc., Bullitt Bldg., Philadelphia, and Frick Bldg., Pittsburgh.

Dunbar Furnaces, Dunbar, Pa.: 2 stacks; Furnace No. 1, blt. 1790, last reblt. 1900, 80' x 19½'; 4 Whitwell-Roberts stoves (2 92' x 18', 1 76' x 22', 1 75' x 18'); Furnace No. 2, 80' x 17'; blt. 1880, reblt. 1905-6; 3 Whitwell-Roberts stoves, 92' x 18'; 3 steam blowing eng. (56,000 cfm.); 10 Wheeler water-tube boilers, 3,900 H. P. Circular pig-iron casting machine. Conn. coke; Lake ore, manganese ore from Cuyuna range. Also 110 Semet-Solvay by-product, and 225 (idle) bee-hive 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. (Formerly owned and operated by the Dunbar Furnace Co.; acquired by present owners, July 1, 1914).

Product: high-manganese, foundry, and forge pig iron; spiegel-eisen 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, Ironton, Crow Wing County, Minn. Annual capacity of mines, 300,000 tons.

AMERICAN MANGANESE STEEL CO., 332 S. Michigan Ave., Chicago, Ill.

Inc. May 27, 1910. Capital stock: com., \$1,500,000; pref. auth., \$1,500,000; issued, \$1,324,000. (Formerly called Edgar Allen American Manganese Steel Co., name changed, April 15, 1915).

R. Ortmann, P.; J. B. Terbell, V. P.; W. S. McKee, V. P.; S. T. McCall, Sc. & T.; N. C. Peebles, P. A.; at Chicago. W. G. Nichols, V. P.; at Chicago Heights.

Sales offices:

Denver, 412 First Nat. Bank Bldg., A. T. Herr Supply Co.

New York, 30 Church St., E. L. Pemberton.

Pittsburg, Kansas, Pittsburg Machinery Co.

Portland, Ore., 914 Lewis Bldg., A. L. Maeder Co.

Salt Lake City, Newhouse Bldg., F. E. Johnson.

San Francisco, Insurance Exchange Bldg., J. W. Plant.

Savannah, Georgia Supply Co.

Seattle, Colman Bldg., J. D. Hull.

Brands: "Stag," "M," "E," "B B," and "A M S Co."

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

↪ Chicago Heights Works, Chicago Heights, Ill.: blt. 1899-1900; acquired July 1, 1910, from the American Brake Shoe and Foundry Co.; 4 2-ton Tropenas converters, 8 auxiliary fur.; 2 cupolas. Fuel, coke and oil. Machine shop for own use. (1 6-hole crucible steel melting furnace dismantled in 1911). Adding electric fur.

Product: manganese steel castings for railway frogs, crossings, switches, machinery, etc., for sale. Annual cap., 12,000 tons.

New Castle Works, New Castle, Del.: blt. 1908-09 by the Tropenas Steel Co.; f. o. Mar. 25, 1909; acquired by the present owners June 8, 1910; two 2-ton Tropenas converters and 1 cupola. Fuel, coal, coke and oil. Machine shop for own use. (1½-ton Tropenas steel converter, blt. in 1908-9, dismantled in 1913).

Product: manganese steel castings for railway frogs, crossings, switches, machinery, etc., for sale. Annual cap., 3,600 tons.

Total annual cap. of the 2 steel casting plants, 15,600 tons.

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

Org. and inc. Dec. 26, 1899. Capital stock: com. \$6,400,000; pref. 6% cum. \$800,000.

George M. Verity, P.; R. B. Carnahan, Jr., V. P.; George H. Charls, V. P. & M. S.; R. C. Phillips, Sc.; N. W. Collord, T. & A.; C. W. Davis, A. T.

Sales offices:

Chicago, 1266 Peoples Gas Bldg.

Cincinnati, 2101 Union Central Bldg.

Detroit, 902-3 Ford Bldg.

New York, 551 Hudson Terminal Bldg.

Pittsburgh, 1832 Oliver Bldg.

San Francisco, 813 Postal Telegraph Bldg.

St. Louis, 814 New Bank of Commerce Bldg.

Brands: "Armco," "American Ingot Iron," "Miami" galvanized sheets.

Product: O. H. ingots and castings, sheet bars, billets, slabs, black and galvanized sheets, black plate for tinning, tinplates, and terne plates.

East Side Works, Middletown: blt. 1911; 4 B. O. H. fur. (70-ton); first steel made, Sept. 10, 1911; 12 Hughes gas prod.; 2 trains (40" 2-h. 1-st. reversing blooming, 24" bar with 24" 3-h. 2-st. and 24" 2-h. 1-st. bullhead); 3 jobbing mills (30" x 38", 30" x 54", 30" x 68") with 4 slab and 2 sheet heat. fur.; 4 open annealing fur.; 8 black sheet mills (30" x 38" to 30" x 54") with 8 sheet and 8 pair fur.; 8 single-stand cold mills, 26" x 38" to 26" x 66"; 24 box annealing fur.; 1 Mesta pickling mach.; 7 galvanizing pots. Fuel, coal, prod. and nat. gas. Machine shop for own use. Product and annual cap.: ingots (130,000 tons); billets, slabs and sheet bars (175,000 tons); sheets and plates (100,000 tons); galvanized sheets (75,000 tons).

Central Works, Middletown: blt. 1899; f. o. Feb. 7, 1900; 4 B. O. H. fur. (3 50-ton, 1 10-ton); 4 black sheet mills (3 28" x 38", 1 28" x 48"); 4 pair and 4 sheet fur.; 2 single-stand cold mills, 26" x 48"; 11 box annealing fur. Fuel, nat. gas and crude oil. Machine shop for own use. Steel foundry; ingot iron castings for galvanizing equipment, flue boxes, gears, etc., for own use and for sale. Product and annual cap.: ingots (75,000 tons), steel castings (3,000 tons), sheets (20,000 tons).

Muskingum Branch, Zanesville, Ohio: blt. 1900-1, f. o. Oct. 16, 1901; 6 black sheet mills, 28" x 32" to 29½" x 48"; 5 sheet, 6 pair, 1 comb. tin mill heat. fur.; 5 single-stand cold mills (3 28" x 36", 2 28" x 50"); 8 double box annealing fur.; 1 Mesta pickling mach. Tinplate dept.: blt. 1912, first terne plates made April 10, 1912, first tinplates made April, 1915; 6 tinning stacks, 5 for terne and 1 for tinplates. Fuel, nat. gas. Product and annual cap.: sheets (30,000 tons); terne plates (75,000 base boxes); tinplates (12,500 base boxes).

American Rolling Mill Corporation. Works at Muncie, Ind., see 1908 Directory, p. 380, were dismantled in May, 1910. Robey Street Works at Chicago, Ill., see 1908 Directory, p. 388, sold to Interstate Iron and Steel Co. in 1910 and dismantled in 1910.

AMERICAN SHEET AND TIN PLATE CO., Frick Bldg., Pittsburgh, Pa. Subsidiary of the United States Steel Corporation.

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

Selling agents;

Chicago, Continental & Commercial National Bank Bldg., W. H. Eaton.

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

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

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

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

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

Philadelphia, Widener Bldg., T. W. Simpers.

Pittsburgh, Frick Bldg., J. R. Bates.

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

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

Products: black sheets, black annealed sheets, galvanized sheets; flat and corrugated, galvanized, painted and formed roofing, siding, etc.; cold rolled, polished and planished sheets; black plate for forming, stamping, enamelling, etc.; black plate specialties; black plate for tinning, tin plates and terne plates.

SHEET MILLS.

Aetna-Standard Works, Bridgeport, Ohio: orig. blt. 1872; 3 regenerative gas heat. fur., 2 open annealing fur.; 5 pair and 5 sheet fur.; 6 comb. pair and sheet fur.; 12 double box annealing fur.; 30" x 72" 3-h., 28" x 60" 2-h. plate mills; 11 hot black sheet mills (10 26" x 38" and 1 26" x 44"); 5 cold mills (4 22" x 46", 1 22" x 58"); 7 galvanizing pots. Fuel, coal. *Sheet mills and galvanizing dept. idle.* Product: black plates, galvanized sheets, and formed roofing. Annual cap., 37,500 tons black plates.

Dover Works, Canal Dover, Ohio: blt. 1865-66; enl. 1895; first iron rolled 1866; 6 pair, 7 sheet, and 5 comb. pair and sheet fur.; 1 single door, single length, 2 1-d. double length and 2 2-d. annealing fur.; 11 hot sheet mills (6 28" x 38", 2 28" x 34", 1 28" x 42", 2 28" x 48"); 4 cold mills (3 24" x 48", 1 24" x 52"); 4 galvanizing pots; also pickling, painting and forming plant. Fuel, coal.

Product: light plates, black and galvanized, painted and formed, and cold rolled sheet steel. Annual cap., 66,000 tons black sheets, 30,900 tons galvanized sheets.

Gary Sheet Mill, Gary, Ind.: construction begun April, 1910; first products rolled, June 1, 1911; 8 pair fur.; 8 sheet fur.; 8 comb. pair and sheet fur.; 14 double and 6 single annealing fur.; 4 slab heat., 4 rehear. and 4 open annealing jobbing mill fur.; 6 slab heat. and 2 open annealing plate mill fur.; 22 hot mills, (2 32" x 84" plate, with 2-h. roughing and 3-h. finishing rolls; 4 32" jobbing mills; 16 hot sheet mills (11 32" x 40", 4 32" x 48", 1 32" x 56")); 13 cold mills (2 26" x 40", 7 26" x 44", 2 26" x 56", 2 26" x 66"); 10 galvanizing pots. Fuel, coal and prod. gas; power, electricity.

Product: plates and sheets of various gauges; also black sheets, chiefly for galvanizing. Annual cap. of plate mills, 140,400 tons; jobbing mills, 75,700 tons; sheet mills, 133,800 tons; and 119,800 tons galvanized sheets.

Guernsey Works, Cambridge, Ohio: blt. 1889-90; f. o. July, 1890; 3 pair and 3 sheet fur.; 8 comb. pair and sheet fur.; 6 2-d. annealing fur.; 11 hot sheet mills (2 26" x 34", 1 26" x 38", 5 28" x 38", 3 28" x 44"); 4 24" x 44" cold mills; 8 galvanizing pots. Fuel, coal. Product: black sheets, painted and formed roofing, and galvanized sheets. Annual cap., 53,300 tons of black, 80,000 tons galvanized sheets.

Hyde Park Works, Hyde Park, Pa.: blt. 1895; f. o. Sept. 1, 1895; 5 Bailey comb. pair and sheet fur.; 1 single sheet fur.; 1 single pair fur.; 7 annealing fur.; 6 26" x 41" sheet mills; 3 cold mills (2 24½" x 42", 1 24½" x 44") Fuel, nat. gas. and coal.

Product: fine grades of soft steel sheets for stamping, japanning, tinning, galvanizing, and armatures, double annealed and cold rolled and cold rolled and annealed finishes, annual cap., 25,700 tons sheets.

Leechburg Works, Leechburg, Pa.: blt. 1872; 11 comb. pair and sheet fur.; 7 double annealing fur.; 11 hot sheet mills (2 24½" x 39", 5 26" x 41", 3 28" x 41", 1 28" x 45"); 5 cold mills (1 24½" x 45", 1 26" x 45", 1 28" x 45", 2 28" x 50"). Fuel, nat. gas and coal. Product: steel sheets, annual cap., 53,200 tons.

Mercer Works, Farrell, Pa.: blt. 1901-3; rebld. 1904-5 and 1913-14; f. o. Aug., 1905; 8 pair and 8 sheet fur.; 8 2-d. annealing fur.; 8 hot sheet mills (2 28" x 34", 4 28" x 38", 1 28" x 48", 1 28" x 54"); 10 cold mills (1 22" x 38", 1 22" x 48", 2 22" x 53", 3 24" x 48", 3 24" x 54"). Fuel, coal and prod. gas. (Owned by the Union Steel Co.; leased to and operated by the American Sheet and Tin Plate Co.) Product: black sheets, annual cap., 40,600 tons.

New Philadelphia Works, New Philadelphia, Ohio: blt. 1883; 2 pair, 2 sheet and 8 comb. pair and sheet fur.; 2 softening and 2 slab fur.; 7 double and 2 single annealing fur.; 10 hot sheet mills (3 28" x 34", 5 28" x 38", 2 30" x 48"); 2 jobbing mills (1 30" x 48", 1 30" x 60"); 8 cold mills (5 24" x 44", 2 26" x 60", 1 24" x 48"). Fuel, coal. Product: light plates, black sheets, and cold rolled sheet steel. Annual cap., 53,600 tons black sheets, 26,400 tons plates.

Old Meadow Works, Scottdale, Pa.: blt. and f. o. 1898; 8 pair and 8 sheet fur.; 7 single annealing fur.; 6 hot sheet mills (3 26" x 38", 1 26" x 44", 1 26" x 50", 1 28" x 44"); 2 26" x 42" hot tin mills; 2 cold mills (1 26" x 44", 1 26" x 50"). Fuel, coke breeze, coal and gas. Product: steel sheets, annual cap., 39,700 tons.

Scottdale Works, Scottdale, Pa.: blt. 1873; remod. 1894, 1897, and 1908; 3 pair, 3 sheet and 6 comb. fur.; 6 double annealing fur.; 1 hot tin mill, 26" x 36" or 26" x 42"; 8 hot sheet mills (4 23" x 36", 4 26" x 42"); 5 cold mills (3 24" x 44", 2 24" x 50"); 7 galvanizing pots (6 48", 1 54"). Fuel, coal and nat. gas. Product: black and galvanized sheets, flat and corrugated. Annual cap., 49,000 tons sheets, 113,800 tons galvanized sheets.

Vandergrift Works, Vandergrift, Pa.: blt. 1895-96, f. o. Oct., 1895; 4 35-ton B. O. H. fur. (79,000 tons ingots); 8 35-ton A. O. H. fur. (196,000 tons ingots); first O. H. steel made, Jan. 11, 1897; 4 soaking pits; 34" blooming mill, two 16" 2-h. 3-st. cont. bar mills; 6 pair, 5 sheet fur.; 30 comb. sheet and pair fur.; 35 sheet mills (5 28" x 36", 16 28" x 41", 6 28" x 45", 1 32" x 41", 6 32" x 46", 1 32" x 60"); 16 cold mills (6 26" x 45", 5 26" x 48", 1 26" x 65", 1 28" x 53", 2 28" x 57", 1 28" x 65"); 24 double, 2 single annealing fur.; 22 galvanizing pots; plant for the manufacture of sulphuric acid, annual cap., 11,000 net tons. Fuel, nat., prod. gas and coal. Product: acid and basic O. H. steel ingots, sheet bars, black and galvanized sheets; annual cap., 275,000 tons ingots, 233,900 tons sheet bars, 194,000 tons black sheets, 234,300 tons galvanized sheets.

Wellsville Works, Wellsville, Ohio: orig. blt. 1873, remod. 1880; 10 pair, 10 sheet fur.; 1 slab fur., 26 1-d., 2 2-d. annealing fur.; 9 hot sheet mills (2 24" x 34", 2 28" x 34", 3 28" x 38", 1 28" x 44", 1 28" x 50"); 1 28" x 56" jobbing mill; 14 cold mills (10 24" x 38", 1 24" x 48", 2 26" x 48", 1 26" x 56"). Fuel, coal. Product: light plates and sheet steel, highly finished sheet steel, and blued sheets. Annual cap., 49,200 tons black sheets, 22,500 tons polished sheets.

Wood's Works, McKeesport, Pa.: blt. 1851; 16 forge fires; 16 annealing fur.; 15 pair fur.; 12 double sheet fur.; 4 bar heat. fur.; 3 slab. fur.; 1 softening fur.; 17 heat. fur. for hammered sheets; 20" bar mill; 12 hot sheet mills (8 21" x 40", 2 21" x 44", 1 24" x 40", 1 24" x 48"); 6 cold mills (2 20" x 40", 4 24" x 40"); 7 ham. (3,000 to 4,500-lb.). (2 15-ton O. H. fur. blt. 1889-90, dismantled 1910.) Charcoal refinery fires for charcoal blooms. Fuel, nat. and prod. gas, coal, and charcoal. Product: light plates and sheet iron and sheet steel, both black and planished; specialty, patent planished sheet iron. Annual cap., 21,500 tons sheet bars, 40,300 tons sheets, 21,000 tons plates, 7,500 tons polished and planished sheets, 9,600 tons hammered charcoal blooms.

Total annual cap. of 13 sheet mills and steel works, 275,000 tons O. H. ingots, 255,400 tons large and small sheet bars, 9,600 tons

of hammered charcoal blooms, 1,099,400 tons black sheets and plates, 578,800 tons galvanized sheets, 30,000 tons polished and planished sheets, 11,000 net tons sulphuric acid.

TIN MILLS.

- American Works, Elwood, Ind.: blt. 1891-92; f. o. June 1892; first tin and terne plates made July, 1892; 28 pair and 28 sheet fur., 5 4-d. annealing fur.; 28 hot tin mills (3 26" x 30", 2 26" x 32", 11 27" x 30", 5 27" x 32", 2 28" x 30", 5 28" x 34"); 26 cold mills (1 20" x 42" single, 2 22" x 42" tandem, 20 22" x 34", 3 22" x 52"); 56 tinning sets. Fuel, coal. Plant for the manufacture of sulphate of iron. Product: black plates and tinplates. Annual cap., 3 turns, 96,300 tons black plates; 2,226,400 base boxes tinplates.
- Cambridge Works, Cambridge, Ohio: blt. 1894; f. o. Dec. 26, 1894; 7 sheet and 7 pair fur.; 6 annealing fur.; 7 hot tin mills (5 26" x 32", 1 28" x 32", 1 28" x 36"); 10 cold mills (6 22" x 36", 3 22" x 40", 1 22" x 48"). Fuel, bit. coal. Product: black plates for tinning and high grade black plate specialties, annual cap., 31,650 tons.
- Chester Works, Chester, W. Va.: blt. 1899-1900; tinning plant added 1901; first black plates made Dec., 1901; first tin and terne plates made May, 1902; 7 pair and 8 sheet fur.; 4 2-d. annealing fur.; 7 hot tin mills (2 28" x 30", 2 28" x 32", 2 28" x 36", 1 28" x 48"); 10 cold mills (1 22" x 52", 1 26" x 52", 8 22" x 40"); 18 sets (15 for tinplates, 3 for terne plates). Fuel, coal. Product: black plates for tinning and large sheets; tinplates and terne plates. Annual cap., 32,200 tons plates and sheets; 536,600 boxes tinplates, 41,500 boxes terne plates.
- Crescent Works, Cleveland, Ohio: blt. 1894-95; f. o. June 1, 1895; first tin and terne plates made Jan., 1896; 6 pair and 6 heat. fur.; 1 2-d., 1 4-d. annealing fur.; 6 hot tin mills (3 27" x 28", 2 27" x 32", 1 28" x 34"); 8 cold mills (3 22" x 34", 3 22" x 36", 2 22" x 40"); 13 sets for tinplates. Fuel, coal. Product: black plates for tinning and stamping; tinplates. Annual cap., 25,700 tons black plates and 477,200 boxes tinplates.
- Farrell Works, Farrell, Pa.: blt. 1900-1; f. o. May 16, 1901; first tinplates made July, 1901; 20 pair and 22 sheet fur.; 7 2-d. annealing fur.; 20 hot tin mills (6 27" x 29", 2 27" x 30", 9 28" x 32", 3 28" x 36"); 26 cold mills (23 22" x 36", 3 22" x 42"); 32 sets for tinplates. Plant for the manufacture of sulphate of iron. Fuel, prod. gas and coal. (Owned by the Sharon Tin Plate Co.; formerly called South Sharon Works.) Product: black plates for tinning; tinplates. Annual cap., 73,600 tons black plates; 1,524,800 boxes tinplates.
- Gary Tin Mill, Gary, Ind.: ground broken for a new plant to be built in 1916.
- La Belle Works, Wheeling, W. Va.: blt. 1893; first black plates

made April, 1894; tinning plant added 1895; first tinplates made July, 1895; first terne plates Jan., 1896; 10 pair and 10 sheet fur.; 4 3-d. annealing fur.; 8 hot tin mills (3 26" x 32", 5 26" x 34"); 10 cold mills (4 22" x 34", 4 22" x 40", 1 22" x 44", 1 24" x 40"); 13 sets for tinplates. Fuel, coal. (In addition to 8 mills above there are 2 mills which are not operated on account of lack of finishing capacity. Product: black plates for tinning; tinplates. Annual cap., 29,750 tons black plates; 534,400 boxes tinplates.

Laughlin Works, Martins Ferry, Ohio: blt. 1895; first black plates made Aug., 1895; tinning plant added, 1895; enl. 1896-97 and 1900; first tin and terne plates made Aug. 29, 1895; 23 pair and 23 sheet fur.; 6 2-d., 1 3-d. annealing fur.; 23 hot tin mills (14 26" x 30", 7 26" x 34", 1 26" x 36", 1 28" x 34"); 24 cold mills (7 22" x 40", 7 24" x 40", 10 24" x 34"); 46 sets for tinplates. Fuel, coal.

Product: black plates for tinning; tinplates. Annual cap., 81,900 tons black plates, 1,798,400 boxes tinplates.

✓ National Works, Monessen, Pa.: blt. 1897-98; f. o. Jan., 1898; first tin and terne plates made Mar., 1898; 25 pair and 25 sheet fur.; 11 2-d. annealing fur.; 25 hot tin mills (1 26" x 32", 15 28" x 32", 7 28" x 34", 2 28" x 36"); 18 cold mills (5 22" x 34", 5 23" x 34", 4 22" x 40", 4 23" x 40"); 47 sets for tinplates and terne plates. Fuel, coal. Product: black plates for tinning; tin and terne plates. Annual cap., 87,000 tons black plates, 1,918,800 boxes tin and terne plates.

New Castle Works, New Castle, Pa.: blt. 1892-93; f. o. Oct., 1893; first tin and terne plates made Nov., 1893; 20 pair, 20 sheet fur.; 8 2-d. annealing fur.; 20 hot tin mills (1 25" x 30", 3 26" x 32", 1 26" x 34", 4 28" x 30", 9 28" x 34", 2 28" x 36"); 27 cold mills (18 22" x 36", 6 22" x 40", 3 22" x 44"); 36 sets for tinplates. Fuel, coal. Product: black plates for tinning; tinplates. Annual cap., 75,200 tons black plates, 1,694,000 boxes tinplates.

✓ Pennsylvania Works, New Kensington, Pa.: blt. 1894; f. o. 1895; first tin and terne plates made April, 1895; 8 pair and 8 sheet fur.; 2 2-d., 1 3-d., 1 4-d. annealing fur.; 8 hot tin mills (5 26" x 30", 1 28" x 34", 2 28" x 36"); 13 cold mills (1 22" x 36", 1 22" x 40", 2 22" x 44", 3 23" x 40", 1 23" x 44", 3 24" x 40", 2 24" x 44"); 13 sets for tinplates. Fuel, coal. Product: black plates for tinning and high grade black plate specialties; tinplates. Annual cap., 31,700 tons black plates; 405,600 boxes tinplates.

✓ Pittsburgh Works, New Kensington, Pa.: blt. 1894; f. o. Dec., 1894; tinplate plant blt. 1891-92; first terne plates made Feb. and first tinplates made Oct., 1892; 7 1-d. 1 2-d. sheet and 8 pair fur.; 2 double annealing fur.; 8 hot tin mills (3 26" x 30", 1 26" x 34", 4 28" x 34"); 8 cold mills (1 22" x 37", 3 22" x 40", 1 24" x 37", 3 24" x 40"); 14 sets for tinplates. Fuel, coal. Product: black plates for tinning and soft stamping sheets; tinplates. Annual cap., 28,800 tons black plates; 589,600 boxes tinplates.

Sabraton Works, Morgantown, W. Va.: blt. 1902-4, rebld. 1905-6; f. o. April 16, 1906; first tinplates made April, 1906; first terne plates made July, 1909; 10 pair and 10 sheet fur.; 3 4-d. annealing fur.; 10 hot tin mills, (2 26" x 30", 4 26" x 32", 3 28" x 32", 1 28" x 34"); 10 cold mills (6 22" x 34", 4 22" x 44"); 24 sets (7 for tinplates, 17 for terne plates). Fuel, nat. gas.

Product: black plate and black plates for tinning; tin and terne plates. Annual cap., 41,600 tons black plates; 168,200 boxes tinplates and 692,500 boxes terne plates.

Shenango Works, New Castle, Pa.: blt. 1897-98; f. o. April, 1899; first tin and terne plates made July, 1899; 30 pair and 36 sheet fur.; 11 2-d. annealing fur.; 30 hot tin mills (11 26" x 30", 4 26" x 33½", 1 28" x 30", 12 28" x 34", 1 28" x 36", 1 28" x 42"); 30 cold mills (24 22" x 36", 3 22" x 44", 3 22" x 46"); 45 sets for tinplates. Fuel, coal. Product: black plates for tinning and tinplates. Annual cap., 110,400 tons black plates; 2,325,600 boxes tinplates.

Total annual cap. of the 12 tinplate and terne plate works, triple turn, 14,933,600 boxes of 100 lbs.

Roll and Machine Works, Canton, Ohio. Product: chilled rolls, sand rolls, iron castings, annual cap., 17,136 net tons chilled and sand rolls, 4,480 net tons iron castings, 450 net tons brass castings.

The company also owns sulphate of iron plants at Farrell, Pa., and Elwood, Ind.; total annual cap. 8,500 net tons. Also a plant at Vandergrift, Pa., for the manufacture of sulphuric acid, annual cap., 11,000 net tons.

The company owns or leases 1,639 acres of coal lands located in Armstrong and Westmoreland counties, Pa.; Tuscarawas and Belmont counties, Ohio.

In addition the company owns the McKeesport Terminal Railroad, at McKeesport, Pa., and The Elwood, Anderson and Lapelle Railroad, at Elwood, Ind.

American Steel and Iron Co., Norwalk, Ohio, see Norwalk Steel and Iron Co.

AMERICAN STEEL AND TUBE CO., Lorain, Ohio.

Works at Lorain: blt. 1907; f. o. Sept., 1910; 2 heat. fur., 2 trains (20" 3-h. 2-st. bar, 24" x 44" 2-h. 2-st. jobbing plate).

Product: sheet bars, slabs, grooved plate, tie plates, and plates and sheets from No. 7 to 18 gauge. Annual cap., 25,000 tons bars, 6,000 tons plates.

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

Subsidiary of the United States Steel Corporation.

Wm. P. Palmer, P.; A. S. Chisholm, A. P.; E. E. Stone, G. P. A.; C. A. Vogt, A.; at Cleveland. J. S. Keefe, V. P.; F. Baackes, V. P. & G. S. A.; A. F. Allen, Sc. & A. T.; J. R. Thomas, T.; at

208 So. LaSalle St., Chicago. C. L. Miller, V. P. & G. S.; at Frick Bldg., Pittsburgh. R. R. Hampson, A. T.; at 30 Church St., New York.

Sales offices:

Baltimore, 32 South Charles St.

Birmingham, Brown Marx Bldg.

Boston, 120 Franklin St.

Buffalo, 337 Washington St.

Butte, Mont., 19 W. Granite St.

Chicago, 208 So. LaSalle St., F. Baackes, V. P. & Gen. Sales Agt.

and D. A. Merriman and G. F. Rummel, Ass't Gen. Sales Agts.

Cincinnati, Union Trust Bldg.

Cleveland, Western Reserve Bldg.

Denver, First Nat'l Bank Bldg.

Detroit, Foot of 1st St.

Kansas City, Mo., 1207 West 9th St.

New York, 30 Church St., T. H. Taylor, Ass't. Gen. Sales Agt.

Philadelphia, Widener Bldg.

Pittsburgh, Frick Bldg.

Oklahoma City, State National Bank Bldg.

St. Louis, Third Nat'l Bank Bldg.

St. Paul, Pioneer Bldg.

Salt Lake City, Walker Bank Bldg.

Worcester, Mass., 94 Grove St.

Product: Bessemer and basic pig iron, Bessemer and open hearth steel ingots, blooms, billets, slabs, 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.

Allentown Works, Allentown, Pa.: blt. 1886: 2 gas heat. fur.; 5 trains (16" 3-h. 5-st. roughing, 14" 2-h. 2-st. cont., 14" 2-h. 3-st. intermediate, 10" 2-h. 4-st. roughing, 10" 2-h. 4-st. finishing); 253 wire drawing blocks for wire No. 00 to No. 20 gauge; 206 wire nail mach.; 3 galvanizing pans. Fuel, coal and producer gas. Machine shop for own use. Product and annual cap.: 130,000 tons wire rods, 120,000 tons wire, 55,000 tons galvanized wire, 740,000 kegs wire nails; barbed wire.

American Works, Cleveland, Ohio: blt. 1886: 3 heat. fur.; 9 gas prod.; Garrett rod mill with 13 st. consisting of 16" 3-h. roughing, 12" 2-h. train, 9" 2-h. intermediate, 9" 2-h. finishing; Morgan cont. rod mill, 21 2-h. stands with 13" roughing, 9" intermediate, and 10" finishing; 4,345 wire drawing blocks for wire to No. 40 gauge; 19 galvanizing pans (3 for coarse, 16 for fine wire); 10 tinning fur. Cold rolling dept. Fuel, coal, natural and producer

- gas. Gray iron foundry, annual cap., 150 tons, and machine shop for own use. Make chilled iron dies for own use, annual cap., 360 tons. Product and annual cap.: 140,000 tons of wire rods, 65,000 tons wire; 27,000 tons galvanized wire, 5,500 tons tinned wire, 3,000 tons cold rolled wire, 1,900 tons wire strand.
- Anderson Works, Anderson, Ind.: blt. 1889; 2 cont. heat. fur.; Garrett rod mill with 18" 3-h. 1-st., 18" 2-h. 1-st. roughing, 12" 2-h. 3-st. intermediate, 10" 2-h. 4-st. intermediate, 10" 2-h. 4-st. finishing; 107 wire drawing blocks for wire No. 000 to No. 21 gauge; 166 wire nail mach.; 2 galvanizing pans. Fuel, coal and producer gas. Machine shop for own use. Product and annual cap.: 120,000 tons wire rods, 60,000 tons wire, 33,000 tons galvanized wire, 805,000 kegs wire nails; barbed wire, wire fence.
- Anthony Works, Tecumseh, Mich. (formerly Anthony Fence Co. acquired by American Steel & Wire Co. in June, 1910). Product: woven wire fence.
- Bluff Street Works, Joliet, Ill. Idle.
- Braddock Works, Braddock, Pa.: blt. 1891; 2 heat. fur.; Garrett rod mill with 18" 3-h. 5-st. and 18" 2-h. 2-st. roughing, 12" 2-h. 3-st. intermediate, 10" 2-h. 4-st. intermediate, 12" 2-h. 4-st. finishing; 216 wire drawing blocks for wire to No. 20 gauge. Fuel, coal and producer gas. Machine shop for own use. Wire nail machines and galvanizing department dismantled in 1908. Product and annual cap.: 90,000 tons steel wire rods, 80,000 tons plain wire.
- Breaker Island Furnaces, Breaker Island, opposite Troy, N. Y.: 3 stacks, 80' x 18': blt. 1886-87; 12 Whitwell stoves. *Last active in 1897.*
- Central Furnaces, Cleveland, Ohio: 4 stacks: "A" (formerly No. 5), blt. 1900-01, f. o. January 17, 1901, 97' 3" x 22', 4 2-pass stoves, 100' x 22'; "B" (formerly No. 2), blt. 1881-82, last rebt. 1904, 90' x 22', 4 stoves (one 3-pass, 85' x 21'; three 2-pass, 100' x 22'); "C" (formerly No. 1), blt. 1887, rebt. 1904, 90' x 22', 4 stoves (same as for "B" above); "D," blt. 1910-11, f. o. July 17, 1911, 95' x 23' (thin-lined), 4 stoves, 100' x 22'; 9 blowing eng. (2 gas, 7 steam), 200,000 cfm.; 2 double-strand Uehling casting machines; 2 sintering machines for flue dust (annual cap., 75,000 tons). Molten metal to the Newburgh Steel Works. Gray iron foundry (annual cap., 1,300 tons) and machine shop for own use. Coke; Lake ore. Product: Bessemer pig iron, annual cap., 730,000 tons.
- Cleveland "E" Furnace (formerly Emma Furnace), Cleveland, Ohio: 1 stack, blt. 1872, last remod. 1904, 72' x 17'; 4 Kennedy stoves, 80' x 22'; 4 steam blowing eng. (30,000 cfm.); 1 Uehling double-strand casting machine; 1 slag granulating pit. Molten metal to Newburgh Steel Works. Conn. coke; Lake ore. Product: Bessemer and basic pig iron, annual cap., 95,000 tons.

Central Works, Worcester, Mass.: Wire mill: 1,475 wire drawing blocks for No. 8 to No. 34 gauge; 9 galvanizing pans; 2 tinning furnaces. Product and annual cap.: 20,000 tons plain wire, 9,700 tons galvanized fence, telegraph and fine wire, 1,300 tons tinned wire.

Consolidated Works, Cleveland, Ohio: blt. 1890-91; 2 heat. fur.; Garrett rod mill with 14-st. consisting of 16" 3-h. roughing, 12" 2-h. train, 10" 2-h. intermediate, 9" 2-h. finishing; 164 wire drawing blocks for wire to No. 16 gauge; 274 wire nail mach.; 3 galvanizing pans. Fuel, coal, natural and producer gas. Machine shop for own use. Product and annual cap.: 110,000 tons wire rods, 85,000 tons wire, 45,000 tons galvanized wire, 1,210,000 kegs wire nails; barbed wire and woven fence.

Cuyahoga Works, Cleveland, Ohio: blt. 1907-08; first wire products made Nov. 3, 1908, first hot rolled products Feb. 4, 1909; 1 cont. heat. fur.; combination train with 15 st. consisting of 16" 2-h. 6-st. cont. roughing, 14" 3-st. double duo intermediate, 14" 2-h. 3-st. tandem finishing; 366 wire drawing blocks; 4 galv. pans, annual cap., 60,000 tons. Fuel, coal, natural and producer gas. Machine shop for own use. Product and annual cap.: 40,000 tons hot rolled flats, 110,000 tons plain wire, 33,000 tons cold rolled flat wire; barbed wire.

Adding 3 cont. billet heat. fur.; 17" 2-h. 8-st. cont. roughing; 1 reheat. fur.; 12" to 10" 2-h. 16-st. cont. rod mill; 1 reheat. fur.; comb. mill for flats with 12" 2-h. 4-st. cont., 10" 2-h. 7-st. cont. and 3-h. 4-st. single Belgian finishing. Annual cap., 110,000 tons rods, 40,000 tons flats.

DeKalb (East and West) Works: DeKalb, Ill.: Wire mills: 320 wire drawing blocks, No. 0 to No. 20 gauge; 167 wire nail machines; 5 galvanizing pans. Machine shop for own use. Product and annual cap.: 100,000 tons wire, 50,000 tons galvanized wire, 1,075,000 kegs wire nails; barbed wire, wire fence, poultry netting; 3,300 tons sulphate of iron.

DeKalb (North and South) Works, DeKalb, Ill.: Product: woven fence. Formerly owned and operated by DeKalb Fence Co.; acquired by American Steel & Wire Co., August, 1910.

Donora Works, Donora, Pa. (Owned by Union Steel Co.; leased to and operated by American Steel and Wire Co.)

Donora Furnaces: 2 stacks: blt. 1902-04; No. 1, f. o. Jan. 3, 1905, No. 2, f. o. Feb. 7, 1905; 85' x 22'; 8 Kennedy stoves, 100' x 24'; 5 steam blowing eng.; 2 Heyl & Patterson double-strand casting mach.; 2 slag granulating pits. Conn. coke; Lake ore. Gray iron foundry for own use. Product: basic pig iron, annual cap., 350,000 tons.

Donora Steel Works: blt. 1902-03; first steel made Feb. 7, 1905, first rolled products Mar. 2, 1905; 11 B.O.H. fur. (60-ton); 2 A. O. H. fur. (60-ton); 5 4-hole soaking pits; 2 trains (40" 2-h. 1-st.

reversing blooming, 30" 3-h. 1-st. billet). Adding 2 Bessemer converters (25-ton) for duplexing; 1 mixer (1,300-ton); one 4-hole soaking pit. Fuel, coal and natural gas. Machine shop for own use. Product and annual cap.; 465,000 tons basic and 85,000 tons acid ingots; 495,000 tons blooms, slabs, billets, forging blooms and forging billets; or 486,000 tons billets.

Donora Wire Works: blt. 1900-01, f. o. Sept., 1901; 5 heat. fur.; continuous roughing combined with 2 Garrett finishing rod mills with 16" 2-h. 6-st. cont. billet, 16" 2-h. 1-st. and 12" 2-h. 1-st. intermediate, two 12" 2-h. 4-st. intermediate, two 10" 2-h. 2-st. intermediate, two 12" 2-h. 4-st. finishing; 524 wire drawing blocks, No. 00 to No. 20 gauge; 346 wire nail mach.; 7 galvanizing pans for wire and 1 for hoop stock; 2 nail galvanizing furnaces. Fuel, coal, natural and producer gas. Machine shop for own use. Product and annual cap.: 335,000 tons wire rods, 200,000 tons wire, 95,000 tons galvanized fence wire, 4,000 tons galvanized nails, 1,525,000 kegs wire nails, 8,000 tons sulphate of iron; barbed wire, woven fence.

Adding 2 double cont. heat. fur.; Garrett rod mill (from New Haven Works) with 18" 3-h. 1-st., two 14" 2-h. 1-st., 12" 2-h. 5-st., 10" 2-h. 4-st.; annual cap., 83,000 tons rods.

Donora Zinc Works: blt. 1915, f. o. Oct. 20, 1915. Annual cap., 40,000 tons spelter, 100,000 tons sulphuric acid. (Owned by Donora Zinc Co.; operated by American Steel and Wire Co.)

Fairfield Works, Fairfield, near Birmingham, Ala.: blt. 1910-14, first rolled products Feb. 12, 1914; 2 cont. billet heat. fur.; wire rod mill consisting of 17" 2-h. 10-st. roughing, 14" 2-h. 4-st. and 12" 2-h. 4-st. intermediate, 12" 2-h. 4-st. finishing; 252 wire drawing blocks for wire to No. 20 gauge; 192 wire nail mach.; 4 galvanizing pans. Fuel, producer gas. Machine shop for own use. Product and annual cap.: 110,000 tons wire rods, 105,000 tons wire, 60,000 tons galvanized wire; 1,010,000 kegs wire nails; barbed wire and woven fence; 2,200 tons sulphate of iron.

Farrell Works, Farrell, Pa. (formerly Sharon Works): blt. 1900-01, first wire May, 1901, first rods rolled Aug., 1901; 2 cont. heat. and 1 re-heat. fur.; two 12" 2-h. 6-st. cont. roughing, two 12" 2-h. 8-st. continuous finishing; 270 wire drawing blocks for wire to No. 20 gauge; 280 wire nail mach.; 4 hot galvanizing pans; 1 electro-galvanizing pan. Fuel, coal and producer gas. Machine shop for own use. (Owned by Union Steel Co.; leased to and operated by American Steel and Wire Co.) Product and annual cap.: 150,000 tons wire rods, 100,000 tons wire, 60,000 tons galvanized wire; barbed wire, woven fence; 1,010,000 kegs wire nails.

H. P. Works, Cleveland, Ohio: blt. 1880; 3 gas heat. fur.: Garrett rod mill with 14-st. consisting of 16" 3-h. roughing, 12" 2-h. train, 10" 2-h. intermediate, 9" 2-h. finishing; 178 wire drawing blocks for wire to No. 25 gauge; 767 wire nail mach.; 1 galvanizing pan;

4 nail galvanizing fur.; spike and pole step dept. Fuel, coal, nat. and prod. gas. Machine shop for own use. Product and annual cap.: 33,000 tons wire rods, 55,000 tons wire, 8,000 tons spikes and pole steps, 8,000 tons galvanized products; 1,255,000 kegs wire nails and tacks.

Hamilton Works, Hamilton, Ont. (The Canadian Steel & Wire Co., Ltd.). Product: woven wire fence.

New Haven Works, New Haven, Conn.: blt. 1899; Garrett rod mill removed to Donora Wire Works; 891 wire drawing blocks for wire to No. 36 gauge; 10 wire nail mach.; 7 galvanizing pans; 2 tinning furnaces. Machine shop for own use. (Formerly owned and operated by the National Wire Corpn.; acquired by American Steel & Wire Co. in 1907.) Product and annual cap.: 20,000 tons wire, 3,300 tons galvanized wire, 9,000 tons wire rope, 1,000 tons tinned wire, 22,000 kegs wire nails.

Newburgh Works, Cleveland, Ohio:

Newburgh Steel Works: orig. blt. 1867-68; 2 Bessemer converters (15-ton); 6 B. O. H. fur. (2 50-ton; 4 65-ton); installing 1 B. O. H. fur. (65-ton); 25 soaking pits; 2 heat. fur.; 38" 2-h. 1-st. and 35" 2-h. 1-st. reversing blooming mills; 23" 3-h. 1-st. billet mill; Garrett rod mill with 18" 3-h. 1-st., 18" 2-h. 1-st., 12" 2-h. 3-st., 9" 2-h. 4-st., 9" 2-h. 4-st. Fuel, natural and producer gas. Machine shop for own use. Gray iron foundry for own use. Product and annual cap.: 720,000 tons Bessemer ingots, 215,000 tons open hearth ingots, 840,000 tons blooms, billets, and slabs, 120,000 tons wire rods.

Newburgh Wire Works: 3,684 wire drawing blocks for wire to No. 40 gauge; 19 galvanizing pans (6 for coarse, 13 for fine wire); 10 tinning fur. Dept. for cold rolled flat wire, cold rolled and cold drawn shafting. Product and annual cap.: 100,000 tons wire, 50,000 tons galvanized wire, 8,000 tons tinned wire, 15,000 tons cold-rolled flat wire, 18,000 tons of shafting, 6,600 tons sulphate of iron.

North Works, Worcester, Mass.: Wire Mill: 4,805 wire drawing blocks for wire to No. 43 gauge; 93 wire nail machines; 14 galvanizing pans; 3 electro-galvanizing tanks, 20 tinning fur. Dept. for cold rolled flat wire and cold drawn shafting. Product and annual cap.: 53,800 tons wire, 7,000 tons galvanized wire, 7,000 tons tinned wire, 20,000 tons cold rolled flat wire, 1,200 tons cold-drawn shafting, 200,000 kegs wire nails, 4,000 tons of sulphate of iron.

Pacific Works, San Francisco: Product and annual cap.: 7,000 tons wire rope and cable, 550 tons springs; woven fence.

Rankin Works, Rankin Station, Pa.: blt. 1885-86; 2 heat. fur.; Garrett rod mill with 18" 3-h. 5-st., 16" 2-h. 2-st., 13" 2-h. 1-st., 14" 2-h. 1-st. cont.; 10" 2-h. 3-st., 9" 2-h. 3-st. intermediate; 11½" 2-h. 3-st. finishing; 215 wire drawing blocks for wire to No. 20

gauge; 221 wire nail mach.; 4 galvanizing pans. Fuel, coal, nat. and prod. gas. Machine shop for own use. Product and annual cap.: 135,000 tons wire rods, 125,000 tons wire, 60,000 tons galvanized wire, 1,345,000 kegs wire nails; barbed wire and woven fence.

Rockdale Works, Rockdale, Ill.: Wire Mill: 392 wire drawing blocks for wire No. 2 to No. 22 gauge; 16 wire nail mach.; 7 galvanizing pans (6 for wire, 1 for netting). Product and annual cap.: 120,000 tons wire, 85,000 tons galvanized wire, 110,000 kegs wire nails, 3,300 tons sulphate of iron; barbed wire, woven fence and poultry netting.

Salem Works, Salem, Ohio: Wire Mill: 59 wire drawing blocks for wire to No. 20 gauge; 217 wire nail machines; 4 nail galvanizing fur., annual cap., 2,200 tons. Product and annual cap.: 24,000 tons wire, 515,000 kegs wire nails.

Scott Street Works, Joliet, Ill.: Wire Mill: 200 wire drawing blocks for wire to No. 18 gauge; 234 wire nail mach.; 3 wire galvanizing pans; 4 nail galvanizing fur. Product and annual cap.: 110,000 tons wire, 45,000 tons galvanized fence wire, 4,500 tons galvanized nails, 1,300,000 kegs wire nails, 3,500 tons sulphate of iron; barbed wire and woven wire fence.

Shoenberger Works, Pittsburgh, Pa.: Shoenberger Furnaces: 2 stacks, blt. 1865, rebt. 1890; No. 1, 76' 6" x 16', 4 Massicks and Crooke stoves (one 65' x 18', three 76' x 16' 6"); No. 2, 76' x 14', 4 Massicks and Crooke stoves (one 85' x 18', three 57' x 16' 6"); 5 steam blowing engines; 2 revolving box type casting machines; 2 slag granulating pits. Coke; Lake ore. Product: Bessemer and basic pig iron, annual cap., 175,000 tons.

Steel Works: 2 Bessemer converters (7-ton); 3 B. O. H. fur. (35-ton); 19 soaking pits; 11 heat. fur.; 1 annealing fur.; 15 gas producers; 10 trains (36" 2-h. 1-st. and 32" 2-h. 1-st. blooming, 16" 2-h. 6-st. cont. bar, 16" 2-h. 1-st. bar, two 9" 3-h. 4-st. horseshoe, 8" 3-h. 3-st. horseshoe, 127" sheared plate mill, sheared plate mill with separate roughing and finishing stands consisting of 3 stands 24" x 60" and 24" x 72", plate mills idle); 21 horseshoe machines. Fuel, coal, nat. and prod. gas. Machine shop for own use. Gray iron foundry for own use (600 tons). Product and annual cap.: 330,000 tons Bessemer ingots, 84,000 tons open hearth ingots, 368,000 tons blooms, billets and slabs, 30,000 tons bars, 22,500 tons horse and mule shoes, 1,500 tons toe calks.

South Works, Worcester, Mass.: blt. 1846: 3 A. O. H. fur. (1 15-ton, 1 20-ton, 1 50-ton); 4 B. O. H. fur. (1 20-ton, 3 50-ton); 1 Heroult electric fur. (15-ton); 6 trains (34" 2-h. 1-st. blooming, 20" 3-h. 3-st. merchant, 16" 2-h. 7-st. cont. billet, 11" 2-h. 16-st. cont. rod, 11" 2-h. 14-st. cont. and single Belgian rod, 12" 2-h. 14-st. cont. and double Belgian rod); 293 wire drawing blocks

for steel and copper wire to No. 20 gauge; 5 galvanizing pans; 3 tinning furnaces. Die foundry, annual cap., 750 tons dies for own use. Spring works. Fuel, coal, fuel oil and producer gas. Product and annual cap.: 60,000 tons acid, 75,000 tons basic, 25,000 tons electric steel ingots, 140,000 tons billets, 155,000 tons wire rods, 4,000 tons bars, 64,000 tons wire, 16,000 tons galvanized wire, 3,800 tons tinned wire, 18,000 tons wire rope and strand, 10,000 tons springs, 3,000 tons sulphate of iron.

Trenton Works, Trenton, N. J.: orig. blt. 1845: Wire Mill: 1,155 wire drawing blocks; 2 galvanizing pans; 1 tinning fur. Wire rope dept. Product and annual cap.: 22,000 tons wire, 1,000 tons galvanized wire, 1,000 tons tinned wire, 5,000 tons wire rope and wire cable, 3,500 tons cold rolled flat wire.

Waukegan Works, Waukegan, Ill.: blt. 1891; 4 heat. fur.; 5 trains (15" 2-h. 8-st. cont. roughing, 12" 2-h. 12-st. cont. finishing rod, 12" 2-h. 8-st. double Belgian intermediate rod, 10" 2-h. 8-st. double Belgian finishing rod, 12" to 9" single Belgian with 12-st. 2-h.); 3,124 wire drawing blocks for wire to No. 34 gauge, 17 wire nail machines; 14 galvanizing pans (7 for coarse, 7 for fine wire); 14 tinning fur. Depts. for manufacture of springs, wire strand. Foundry, annual cap., 350 net tons dies for own use. Fuel, coal and coke. Machine shop for own use. Product and annual cap.: 210,000 tons steel and copper wire rods, 170,000 tons wire, 82,000 tons galvanized wire, 6,600 tons tinned wire, 3,500 tons wire strand, 8,000 tons springs, 100,000 kegs wire nails, 7,000 tons sulphate of iron; barbed wire and woven wire fence.

Total annual capacity: 1,350,000 tons pig iron; 1,050,000 tons Bessemer ingots; 984,000 tons open hearth ingots; 25,000 tons electric ingots; 1,834,000 tons billets, blooms, slabs, etc.; 34,000 tons merchant bars; 24,000 tons horseshoes and toe calks; 1,878,000 tons wire rods and hot rolled flat rods; 1,838,800 tons wire; 784,000 tons galvanized wire; 34,200 tons tinned market, broom, mattress and fine wire; 44,400 tons wire rope, strand and cable; 74,500 tons rolled flat products; 12,222,000 kegs wire nails; 8,000 tons spikes and pole steps; 19,200 tons shafting; 40,900 tons sulphate of iron.

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

Org. and inc. Mar. 25, 1904. Capital stock: auth. \$100,000, issued \$99,000.

Eugene S. Reilly, P.; James P. Kelly, Sc.; M. B. Kelly, T.

The company owns a rolling mill and tinplate works at Waynesburg, Pa.; wire nail plant at Ellwood City, Pa.; and special plate rolls at Colonial Steel Co. plant, Monaca, Pa. The company also owns the capital stock of the American Connellsville Coal and Coke Co. and a 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 (1 24" x 44", 2 22" x 34"); Mesta 3-arm pickling mach.; 3 annealing fur. ; 6 tinning stacks. Steam and electric power. Fuel, nat. gas. Charcoal forge dismantled 1911; 3 old sheet mills dismantled 1908. (Formerly owned and operated by Waynesburg Forge, Sheet and Tin Mills; acquired by the Osterberg Tin Plate Co., Sept. 8, 1909; acquired by The Waynesburg Tin Plate Co. in 1913; acquired by American Steel Co., April 15, 1915). Product and annual cap. : black plates for tinning (12,000 tons); tinplates (220,000 base boxes).

Ellwood City Works, Ellwood City, Pa. : 60 wire nail mach. Product : wire nails from 1/2" 18 gauge to 8" 3 gauge, annual cap., 360,000 kegs.

American Cotter Pin Co. Capital stock, \$50,000. Works at Ellwood City, Pa. : 25 machines.

American Connellsville Coal and Coke Co. Capital stock : com. \$115,000; pref. \$235,000; bonds \$345,000. Three plants in the Connellsville district comprising 400 acres of coal lands and 432 hand-drawn bee-hive coke ovens, annual cap., 300,000 tons. (Formerly Sunshine Coal and Coke Co.).

American Steel Casting Co., San Francisco, Cal., 1912 Supplement, p. 55; see Pacific Jupiter Steel Co.

American Steel Corporation, see Oxford Iron and Steel Co.

AMERICAN STEEL FOUNDRIES, McCormick Bldg., 332 S. Michigan Ave., Chicago.

Org. and inc., June 26, 1902. Capital stock : \$17,184,000; bonds outstanding Jan. 1, 1915, \$4,819,100.

Robert 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.; Thomas Drever, C.; Max Pam, General Counsel; at Chicago. W. J. Lynch, 3 V. P.; at New York.

Sales offices :

Chester, Pa.

Cleveland, Society for Savings Bldg.

Denver, Century Bldg.

Houston, Texas, Southern Pacific Bldg.

New York, 30 Church St.

Philadelphia, Real Estate Trust Bldg.

Pittsburgh, 36th St. and A. V. Ry.

St. Louis, Frisco Bldg.

Saint Paul, Merchants National Bank Bldg.

Washington, D. C., Munsey Bldg.

Product : steel castings for locomotives, car castings, couplers, car wheels, machinery castings, rolling mill rolls, car truck frames, bolsters, castings for battleships, etc., for sale; also alloy steel castings.

STEEL CASTING WORKS

- Alliance Works, Alliance, Ohio: blt. 1883; since enl.; 5 B. O. H. fur. (20-ton); 2 heat. fur. (2-d. and 3-d. reverb.). Fuel, prod. gas. Machine shop for own use. Product: couplers and other car castings for sale, annual cap., 48,000 tons.
- East St. Louis Works, East St. Louis, Ill.: blt. 1900; f. o. June 14, 1900; 1 A. O. H. fur. (25-ton stationary); 5 B. O. H. fur. (25-ton stationary, three 15-ton and one 20-ton Wellman-Seaver rolling); 2 heat. fur. (2-d. gas and 4-d. reverb.). Fuel, oil. Machine shop for own use. Product: car castings, couplers, etc., for sale, annual cap., 48,000 tons (10,000 tons acid; 38,000 tons basic).
- Franklin Works, Franklin, Pa.: blt. 1895; f. o. Dec., 1895; 2 Siemens A. O. H. fur. (15-ton); 1 heat. fur. (2-d. gas); 2 reverb. pit annealers. Fuel, nat. gas and oil. Machine shop for own use. Product: locomotive, car, and electric machinery castings for sale, annual cap., 12,000 tons.
- Granite City Works, Granite City, Ill.: blt. 1894; enl. 1898; f. o. Nov., 1894; 6 B. O. H. fur. (25-ton mod. Siemens); 7 heat. fur. (2 2-d. gas, 1 3-d. gas, 4 3-d. reverb.). Fuel, oil. Machine shop for own use. Product: railway car castings, car wheels, alloy steel castings, for sale, annual cap., 62,400 tons.
- Indiana Harbor Works, Indiana Harbor, Ind.: blt. 1903-04; first A. O. H. steel made June 29, 1904; first B. O. H. steel made Dec. 7, 1904; 3 Siemens A. O. H. fur. (5-ton, 2 20-ton); 6-ton Heroult electric fur. added 1915; 3 reverb. pit heat. fur. Fuel, oil. Machine shop for own use. (Electric furnace added 1910, dismantled 1912). Product: alloy steel castings, machinery, railway, and misc. castings for sale, annual cap., 28,800 tons open hearth, and 4,500 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. Machine shop for own use. (30-pot crucible fur. blt. 1889, dismantled 1912). Product: machinery castings, rolling mill rolls, alloy steel castings, for sale, annual cap., 6,600 tons.
- Sharon Works, Sharon, Pa.: blt. 1887; f. o. Aug. 26, 1887; 3 B. O. H. fur. (20-ton); 1 reverb. pit annealer. Fuel, pulv. coal and oil. Machine shop for own use. Product: car truck frames, bolsters, car castings for sale, annual cap., 27,000 tons.
- Thurlow Works, Thurlow, 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. Machine shop for own use. Product: castings for battleships, locomotives, alloy steel castings, machinery castings, annual cap., 24,000 tons.
- Total annual cap.: 261,300 tons of steel castings.

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

AMERICAN TUBE AND STAMPING CO., Bridgeport, Conn.

Org. 1877; inc. 1884; inc. under present name, 1899. Capital stock, \$2,800,000.

C. D. S. Miller, P.; Charles G. Sanford, V. P. & T.; Arthur N. Wheeler, A. T.; P. S. Hill, Sc.

Sales office: 258 Broadway, New York.

Brand: "Swedoh."

Works at Bridgeport: 3 B. O. H. fur. (40-ton); 2 4-hole soaking pits; 34" blooming mill; 10 heat. fur.; 8 hot sheet mills, skelp mills, etc. (8" to 26"). Cold rolling dept. with 10" to 26" mill trains. Machine shop for own use.

Product: ingots, blooms, slabs, and billets; bands, hoops, and narrow plate, cold rolled strip steel. Also make steel tubes, stampings, pressed and stamped sheet steel forms.

AMERICAN VANADIUM CO., Vanadium Bldg., Pittsburgh, Pa.

Inc., Feb. 15, 1906. Capital stock: \$700,000.

James J. Flannery, P.; James C. Gray, 2 V. P.; C. B. Aylesworth, Sc.; H. A. Neeb, T.; at Pittsburgh. E. E. Fernandini, 1 V. P.; at Lima, Peru. J. L. Replogle, 3 V. P. & G. S. M.; at New York.

Sales office: Equitable Bldg., New York.

Works at Kirwan, Allegheny County, Pa.: railroad station, Bridgeville, Pa.: blt. 1907; 20 furnaces for the manufacture of ferro-alloys; first ferro-alloys made May, 1908. Fuel, coal, gas and electricity.

Product: ferro-vanadium, alumino-vanadium, and cupro-vanadium. Annual cap., 5,000 tons.

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

Capital stock: com. \$100,000; pref. 5% cum., \$200,000.

James W. Ames, P.; A. S. Ames, Sc. & T.; W. J. Onderdonk, P. A. Jersey City Spike and Bolt Works, formerly 312 Washington St., Jersey City, destroyed by fire 1910; new works on Communipaw Ave. blt. 1909-10; f. o. 1910; 2 heat. fur. (4-d. gas and 4-d. oil); 2 trains (13" 3-h. 1-st. roughing, 10" 3-h. 4-st. finishing); use scrap iron only. Fuel, prod. gas and oil. Machine shop for own use.

Product: wrought spikes, track and machine bolts, nuts, square plate washers, splice joints, round, square, and flat bars, etc. Annual cap., 10,000 tons.

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

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

Hobart Ames, P.; Charles H. Myers, V. P.; Oliver W. Mink, T.; William H. Ames, Sc.; at Boston. W. J. Alford, V. P.; at Anderson, Ind. Julius C. Birge, V. P.; at St. Louis, Mo.

The company owns or controls the following companies :

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

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

George Griffiths Co., Philadelphia, Pa.

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

Wright Shovel Co., Anderson, Ind.

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 (2 16", 2 22"). Fuel, nat. 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.; and Warren, Ohio.

Andover Iron Co., see 1908 Directory, pp. 118, 119. Blast furnace dismantled and property sold. Limestone property sold. See under Wharton Steel Co.

ANDREWS AND HITCHCOCK IRON CO. (The), Youngstown, O.
Inc. Jan. 22, 1892; org. Feb. 10, 1892. Capital stock: com., \$400,000.

Frank Hitchcock, P.; William J. Hitchcock, V. P. & G. M.; H. W. Heedy, Sc. & T.; H. Glen Heedy, A. Sc. & A. T.

Brands: "Hubbard," "Hubbard Scotch" soft foundry, and "Climax" strong foundry.

Selling agents:

Boston, 201 Devonshire St., Alley & Page.

Cleveland, Hickox Bldg., The Bourne Fuller Co.

New York, 16 Exchange Place, Alley & Page.

Philadelphia, 421 Chestnut St., Jerome Keeley & Co.

Hubbard Furnaces, Hubbard, Ohio: 2 stacks; No. 1, blt. 1867, last rebt., 1910, 80' x 19', 4 Cowper-Kennedy stoves; No. 2, blt. 1872, last rebt. 1915; 5 Cowper-Kennedy stoves; 2 horizontal and 2 upright steam blowing eng.; 14 water-tube boilers, 6,800 H. P.; 3 tubular boilers, 150 H. P. Machine shop for own use. Conn. coke; Lake ore; slag gran. pit, annual cap., 85,000 tons. Operates mines in the Mesabi and Menominee Ranges; and is interested in limestone quarries at Hillsville, Lawrence Co., Pa., with an annual cap. of 300,000 tons.

Product: Bessemer, gray forge, malleable, and foundry pig iron, annual cap., 270,000 tons.

ANDREWS STEEL CO. (The), Newport, Ky.

Org. and inc. 1906. Capital stock: com. \$750,000; bonds \$500,000.

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

Works at Newport: blt. 1906-08; first steel made April, 1908; 6 stationary B. O. H. fur., 1 of which is sometimes operated with an acid lining (3 60-ton, 3 75-ton); 2 trains (34" 2-h. 1-st. blooming; 24" 3-h. 2-st. sheet bar); 9 1-hole soaking pits. Fuel, coal and prod. and nat. gas. Machine shop for own use.

Product: ingots, slabs, sheet and tinplate bars, billets, forging billets and all kinds of alloy steel ingots. Annual cap., 180,000 tons ingots and 150,000 tons rolled products.

ANNISTON ORDNANCE CO., Anniston, Ala.

Anniston Works, Anniston, Alabama: blt. 1884; enl. 1888-93, and 1906; 11 single puddling fur.; 3 double puddling fur.; 3 busheling fur.; 7 coal heat. fur. (1 2-d. scrap and 6 3-d.); 1 rotary squeezer; 1 slab heat. fur.; one 6-ton Heroult electric fur.; 3 trains (18" 3-h. 3-st. muck, 19" 3-h. 3-st. bar, 10" 3-h. 4-st. guide mill); 4 steam ham. (500 to 6,000-lb.); 3,000-lb. helve and 1,640-lb. drop ham. Fuel, coal. Plants for the manufacture of gray iron and malleable castings, iron and steel car and locomotive axles, bolts, rivets, and light and heavy iron and steel forgings are connected with the works; also a plant for building wooden freight cars.

Product: iron and steel car axles and merchant bar iron. Annual cap. 9,000 tons of forged and 30,000 tons of rolled products.

ANTRIM IRON CO., Grand Rapids, Mich.

Org. and inc. Mar. 5, 1886. Capital stock: \$350,000; bonds, \$600,000.

W. Barnhart, P.; J. C. Holt, V. P. & T.; H. J. Bennett, Sc.; at Grand Rapids. N. M. Langdon, G. M. & P. A.; at Mancelona, Mich.

Brand: "Antrim."

Furnace at Mancelona, Mich.: 1 stack, blt. 1887-88; last rebt., 1912; 60' x 12' 6"; hot blast; 2 steam blowing eng. (15,000 cfm.); 8 water-tube boilers, 1,300 H. P. Charcoal; Lake ore. Iron foundry and machine shop for own use. Connected with furnace are 50 charcoal kilns and 24 retorts; annual cap., 2,340,000 bushels.

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

APOLLO ELECTRIC STEEL CO., Apollo, Pa.

Org. Feb. 14, 1916. Capital stock: \$100,000.

F. W. Jackson, P.; W. E. Trautman, V. P.; Robert Lock, T.; J. E. Gallagher, Sc. & G. M.

Plan to build works at Apollo in 1916; to be equipped with 1 B. O. H. fur. (40-ton), 2 electric fur. (10-ton), and sheet bar mill.

APOLLO STEEL CO., Apollo, Pa.

Org. Mar. 12, 1912; inc. April 16, 1912. Capital stock: com. \$300,000.

Robert Lock, P., G. M., & G. S.; W. J. Guthrie, V. P.; A. M. Oppenheimer, Sc. & T.; J. E. Gallagher, A. T.; C. L. Pollock, A.; John Russell, P. A.

Sales offices: Chicago, 332 S. Michigan Boulevard; Cleveland, Citizens Bldg.; Philadelphia, Lincoln Bldg.

Brand: "Made by Apollo Steel Co."

Works at Apollo: construction begun Oct., 1912; f. o. June 16, 1913; 6 hot black sheet mills (2 28" x 36", 3 28" x 40", 1 28" x 46") with 6 comb. heat. fur.; 2 single-stand cold black sheet mills (26" x 44" and 26" x 52"); 4 box annealing fur., 1 oscillating pickling machine; galvanizing department with three pots. Fuel, coal. Machine shop for own use. Electric power.

Product: iron and steel black sheets for sale and for own use; galvanized flat and corrugated sheets. Annual cap., 36,000 tons.

Armor Steel Foundry Co., Chicago, Ill. Corporate title changed from Armor Steel and Foundry Co. Dec. 30, 1908. Matthews Works, Matthews, Ind., see 1908 Directory, p. 379, dismantled in 1911. Winton Place Works, Cincinnati, Ohio, formerly owned by The Steel Foundry Co., acquired Feb., 1911, sold to Cincinnati Car Co. in Dec., 1912 and steel casting plant dismantled 1913. See 1908 Directory, p. 376, 1912 Supplement, p. 40.

Armour Steel Co., Chicago: purchased plant at Riverdale, Ill., in June, 1914, formerly operated by Riverdale Iron and Steel Co.; later by Chicago-Riverdale Iron and Steel Co.; idle; for sale; address Edwin R. Kent, 10848 Longwood Drive, Chicago.

ARMSTRONG, WHITWORTH OF CANADA, LTD., 22 Victoria Square, Montreal, Canada.

Org. and inc. 1913. Capital stock: com. \$2,000,000.

Brigadier General Sir E. P. C. Girouard, P.; 8 Great George St., Westminster, S. W., London. George G. Foster, V. P.; Lawrence Russell, Sc., T., G. S. M., & P. A.; G. W. Odell, C.; M. J. Butler, M. D.; at Montreal. Charles H. Bristol, Acting G. S.; at Longueuil.

Works at Longueuil: blt. 1914-15; 2 12-pot crucible fur.; f. o. 1915; 3-ton Heroult electric steel fur.: 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. 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, steel castings for sale and for own use, 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, 3,000 tons electric steel ingots, 1,600 tons rolled products, 1,000 tons forged products, twist drills, taps, milling cutters, special tools, etc.

ARNESON FOUNDRY CO., South & Exchange Sts., Kenosha, Wis.
Org. Dec. 4, 1903.

Ole A. Arneson (sole owner).

Works at Kenosha: blt. 1914; f. o. Nov., 1914; 1 Whiting converter (2,400-lb.), 1 cupola. Fuel, coke. Gray iron and brass foundry. Product: steel castings for sale; annual cap., 500 tons steel, 900 tons iron, and 25 tons brass castings.

Arrora Manufacturing Co., Factoria, Wash.; built a steel casting plant; one B. O. H. fur., annual cap., 500 tons. Plant abandoned: company out of business.

ASHLAND IRON AND MINING CO., Ashland, Ky.

Inc. Oct. 15, 1901. Capital stock: \$1,547,000.

W. B. Seaton, P.; John Peebles, V. P.; F. B. Moore, Sc. & T.; A. N. Richardson, A.; Charles R. Peebles, F. S.; Ed. C. Jones, P. A.

Selling agents:

Chicago, Pickands, Brown & Co.

Cincinnati, Matthew Addy & Co.

Cincinnati, Eaton, Rhodes & Co.

Cincinnati, Hickman, Williams & Co.

Cincinnati, Walter Wallingford Co.

Cleveland, M. A. Hanna & Co.

New York, Phillips Isham Co.

Brands: "Boyd" foundry pig iron and "Ashland" ferro-silicon.

Ashland Furnaces, Ashland: 2 stacks; 75' x 17'; No. 1, f. o. Aug. 31, 1869; rebld. 1904-05; 2 Massicks & Crooke stoves and 1 Foote stove, each 75' x 18'; No. 2, f. o. Jan. 30, 1888, rebld. 1904-05; 3 Foote stoves, 73' x 18', and 1 Massicks & Crooke stove, 65' x 18'; 4 steam blowing eng. (60,800 cfm.); 11 boilers (5 water-tube and 6 horizontal cylindrical), 4,800 H. P.; 1 single-strand Pittsburgh Coal Washer Co. casting machine. Raw coal and coke; Bath County and Lake ore. Sintering plant for flue dust and fine scale; annual cap., 25,000 tons; gray iron foundry and machine shop for jobbing and own use. Connected with the furnaces are 78 bee-hive coke ovens with an annual cap. of 35,000 net tons of coke. Product: foundry, malleable and basic pig iron; ferro-silicon from 5 to 12% and Bessemer ferro-silicon from 10 to 15%; annual cap., 150,000 tons.

Plan to build open hearth steel plant in 1916; 3 O. H. fur. (75-ton) and blooming mill.

Ashland Sheet Mill: blt. 1900, f. o. 1901; 6 36" black sheet mills, sheets rolled 16 to 30 gauge, 24" to 36" wide and 60" to 144" long;

6 pair and sheet fur.; 8 box annealing fur.; 1 Mesta 3-arm pickling mach., 1 wood pickling tank, 26" x 40" x 168"; 3 galvanizing pots. Fuel, natural gas. (Owned and formerly operated by Ashland Sheet Mill Co., Inc.; leased by Fannin & McCullough Sheet Mill Co., Nov. 30, 1912; acquired by Ashland Iron and Mining Co., Feb. 16, 1916.)

Product: black and galvanized sheets of all grades for sale, annual cap., 25,000 tons.

Ashland Sheet Mill Co., see Ashland Iron and Mining Co.

ASHLAND STEEL CO., Inc., Ashland, Ky.

Inc. Aug. 20, 1890; org. Aug. 27, 1890. Capital stock: \$100,000; bonds, \$120,000.

Thomas M. Adams, P.; L. R. Putnam, T. & G. M.; at Ashland. 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; 2 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, 12" 3-h. 6-st. Belgian). Fuel, coal and nat. gas.

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

Gray iron and steel castings for own use, annual cap., 600 tons.

Atha Steel Casting Co., Newark, N. J., see Titan Co.

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. W.; F. Rodda, S. Mines; at Port Arthur, Ont.

Brand: "Atikokan."

Atikokan Furnace, Port Arthur: 1 stack, 80' x 16'; construction begun May, 1905; 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 Steel Co., Atlanta, Ga. Was inc. as Atlanta Steel Hoop Co. and built steel works and rolling mill at Atlanta in 1901; corporate title changed to Atlanta Steel Co. in 1907; property sold to Atlantic Steel Co., Dec. 9, 1915.

Atlanta Tin Plate and Sheet Mill, Indianapolis, Ind.

E. L. McKee, P.; H. B. Hibben, V. P.; E. B. Porter, Sc. & T.; at Indianapolis.

Works at Atlanta, Ind.: blt. 1903; 4 sheet, 4 pair, 2 annealing fur.; 4 hot black plate mills (2 32", 2 36"); 4 cold mills (34"). Fuel, coal. Galvanizing dept. *Idle for many years.* Annual cap., 14,000 tons sheets or black plates for tinning.

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

R. E. Smith, G. S. of Motive Power.

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

Product: iron rounds and flats for own use.

ATLANTIC STEEL CO., Atlanta, Ga.

Inc. Dec. 7, 1915. Capital stock: com., \$1,000,000; pref. 7% cum., \$750,000; bonds, \$1,000,000.

Thomas K. Glenn, P.; John N. Goddard, V. P.; Robert Gregg, Sc. & T.; W. J. Hartley, G. S.; C. F. Stone, G. S. M.; G. W. Ramey, P. A.

Steel works and rolling mill at Atlanta: blt. 1901; f. o. June, 1901; enlarged 1905-06; 3 B. O. H. fur. (2 35-ton, 1 40-ton), 4 cont. heat. fur.; 4 trains (8" 2 and 3-h. 5-st. hoop and band, 10" 2-h. 12-st. Morgan semi-cont., 14" 2-h. 6-st. cont. billet, 25" 2-h. 1-st. blooming mill) 48 wire drawing blocks; 47 wire nail mach.; 2 automatic spike mach.; first products rolled June, 1901, first O. H. steel made May 10, 1906. Fuel, prod. gas. Machine shop for own use; also wire galvanizing plant. (Formerly owned by Atlanta Steel Co.).

Product: ingots and castings for own use, 1½" to 4" billets, wire rods, hoops, cotton-ties, bars, bands, rounds, squares, plain wire, galvanized wire, barbed wire, wire nails, railroad spikes, etc. Annual cap., 90,000 tons of ingots, 40,000 tons of billets, 30,000 tons of wire rods, rounds, squares, etc., 20,000 tons of hoops, bands, cotton-ties, etc., 150,000 kegs (100 lbs.) of wire nails, 100,000 kegs (200 lbs.) of railroad spikes, 10,000 tons of plain wire, and 6,000 tons of galvanized and barbed wire.

ATLANTIC STEEL CASTING CO., Chester, Pa.

Inc. Sept. 3, 1915. Capital stock: com. auth., \$200,000, issued \$150,000.

D. W. Call, Ch.; A. R. Brunner, P.; Dudley Shoemaker, V. P. & G. M.; C. Toland, Jr., V. P.; R. J. Brunner, Sc. & T.

Works at Chester: blt. 1907, f. o. July, 1907; 8-pot crucible fur. for melting alloys; 4-ton A. O. H. fur. Fuel, oil. (Formerly owned by Keystone Steel Casting Co.)

Product: steel castings for sale for general machinery building from ½-lb. to 500-lb.; chrome, nickel and vanadium alloy steel castings. Annual cap., 3,600 tons open hearth steel castings.

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

Org. 1907; inc. July 2, 1912. Capital stock: com. auth., \$1,000,000; pref. 7% cum. auth., \$500,000.

A. H. Hunter, P. & A. T.; Edward Burgess, 1 V. P.; D. W. Lothrop, 2 V. P.; C. P. Burgess, Sc.; R. J. Gross, T.

Sales office: Railway Exchange Bldg., Chicago.

Works at Dunkirk: blt. 1907-08; first steel made Jan. 27, 1908; first hammered products made Feb., 1908; first products rolled, Aug., 1913; 2 crucible fur. (12 and 30-pot); 5 heat. fur. (2 2-d. and 3 1-d.); 6 steam ham. (600- to 5,000-lb.); 1 4-d. heat. fur. and 10" 3-h. 5-st. merchant train installed 1913. Fuel, coal and nat. gas. (Formerly operated by Burgess & Dickinson; later by Atlas Steel Co.; corporate title changed to Atlas Crucible Steel Co., July 2, 1912).

Product: crucible steel ingots, hammered and rolled bars, squares, rounds, flats, octagons, hexagons, etc., for tools, drills, lathe tools, punches, dies, etc. Annual cap., 1,900 tons of ingots, 1,300 tons of rolled products, 600 tons of hammered products.

ATLAS STEEL CASTING CO., 1963 Elmwood Ave., Buffalo, N. Y. Org. and inc. Mar. 13, 1911. Capital stock: com. auth., \$125,000, issued, \$117,100; pref. 6% cum. auth., \$25,000, issued, \$10,000. George H. Chisholm, P.; E. C. Strong, V. P. & G. M.; H. L. Chisholm, Sc.; C. R. Wyckoff, T. & G. S. M.; Joseph Diebold, G. S.; W. H. Laverack, P. A.

Sales agent: F. D. Moffat & Co., 81 Fulton St., New York.

Works at Buffalo: 1 A. O. H. fur. (15-ton) blt. 1911-12; f. o. Feb. 19, 1912. Fuel, oil. Building 1 A. O. H. fur. (20 ton).

Product: steel castings for sale, annual cap., 10,000 tons.

Atlas Steel Co., see Atlas Crucible Steel Co.

Atlas Steel Foundry Co., see Ohio Crucible Steel Co.

Auto and Motor Castings Co., see Imperial Steel Co.

Baker, Wm. H., Sims-Kent Works, see 1908 Directory, p. 255, sold to Lackawanna Foundries, Mar. 31, 1908; McHaffie furnace dismantled in 1909 and buildings leased to the United States Aluminum Co.

BALDT STEEL CO. (The), New Castle, Del.

Org. and inc. May, 1903. Capital stock: com. auth., \$375,000; issued, \$375,000; pref. 8% cum. auth., \$225,000; issued, \$175,000. Acquired by the Penn Marine and Ordnance Castings Co., Feb. 1, 1916.

Rodney Thayer, P., G. M., & G. S. M.; C. Ferris Jemison, Sc.; Ivers S. Adams, T.; T. J. McIntyre, G. S.; G. A. Pedrick, P. A.; at New Castle. J. W. Ackley, V. P.; at New York City.

Sales offices: 111 Broadway, New York City.

Works at New Castle: blt. 1903-4; f. o. April 22, 1905; 2 A. O. H. fur. (each 30 net tons). Fuel, coal and prod. gas. Machine shop for own use.

Product: steel castings for sale for locomotive and marine work; also vanadium and nickel steel castings. Annual cap., 12,000 tons.

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

Inc. June 7, 1911; org. July 1, 1911. Capital stock: com. \$20,000,000; pref. 7% cum., \$20,000,000; bonds, \$10,000,000.

William L. Austin, Ch.; Alba B. Johnson, P.; Samuel M. Vaclair, V. P.; William deKrafft, Sc. & T.; John P. Sykes, G. S.; G. Greenough, G. S. M.; J. Lindauer, Jr., P. A.

Works at Eddystone and Philadelphia; also building works at East Chicago, Ind., to be equipped for the manufacture of locomotives and parts thereof.

Eddystone Plant, Eddystone, Pa.: blt. 1906; 2 3-d. scrap heat. fur.; 10" 3-h. 4-st. train added 1908; first products rolled 1908. Fuel, bit. coal. Gray iron foundry. Product: merchant and other bars rolled from scrap for own use, annual cap., 11,700 tons; steam and electric locomotives and electric trucks.

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

Baldwin Steel Co., see 1908 Directory, p. 330. Works at Charleston, W. Va., sold to the Becker Steel Co. of America in June, 1914.

BALTIMORE AND OHIO RAILROAD CO. (The), Baltimore, Md.
F. H. Clark, G. S. of Motive Power; J. T. Carroll, A. G. S. of Motive Power.

Mount Clare Shops, Mount Clare, Baltimore, Md.: 1 double Furgeson 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., 2,450 tons.

BANCROFT AND MARTIN ROLLING MILLS CO., lessee, Portland, Me. Org. April 30, 1912; inc. June 1, 1912. Capital stock: com. auth., \$100,000, issued, \$50,000; pref. 7% cum. auth., \$100,000, issued, \$30,000.

Seth L. Martin, P.; Joseph B. Bancroft, Sc. & T.

Sales office: 740 Oliver Bldg., Milk St., Boston.

Brands: "Refined" and "Best."

Works at South Portland: blt. 1866; last rebt. 1903; 5 1-d. busheling fur.; 5 rehear. fur. (3 3-d. 2 4-d.); 4 trains (18" 3-h. 2-st. puddle, 18" 3-h. 5-st. bar, 10" and 16" 3-h. 5-st. tandem, 8" 3-h. 4-st. mill); 1 B. O. H. fur. (25-ton) added 1909-10; first steel made April 27, 1910. Fuel, bituminous coal. (Owned and formerly operated by Portland Iron and Steel Co.; leased by Bancroft and Martin Rolling Mills Co., June 1, 1912).

Product: steel ingots, iron and steel merchant bars, steel bars for reinforced concrete work; bolt iron and shafting. Annual cap., 12,000 tons of ingots and 30,000 tons of rolled products.

Bancroft, Ross & Sinclair Co., New Orleans, see Dibert, Bancroft & Ross.

BANNER IRON WORKS, 4560 Shaw Ave., St. Louis, Mo.

Org. Jan., 1901; inc. Feb., 1901. Capital stock: \$135,000.

W. T. Koken, P.; H. A. Frielingsdorf, V. P.; E. C. F. Koken, Sc. & T.

Works at St. Louis: blt. 1901; 1 side-blown Bess. converter (2-ton) added 1910-11; converter not in operation. Fuel, oil. Machine shop for jobbing.

Product: steel and gray iron castings for sale. Annual cap., 3,000 tons of steel and 4,000 tons of iron castings. Also make architectural cast iron and steel work for buildings.

BARNUM-RICHARDSON CO., Lime Rock, Conn.

Est. 1734; inc. 1864. Capital stock: \$200,000.

C. W. Barnum, P.; R. N. Barnum, V. P. & T.; M. B. Richardson, Jr., Sc.; S. W. Bradley, A. T.

Selling agents:

Boston, 79 Milk St., J. O. Henshaw.

New York, Grand Central Terminal Bldg., Louis A. Shepard.

Philadelphia, Hickman, Williams & Co.

Pittsburgh, Hickman, Williams & Co.

Brand: "Salisbury."

Product: charcoal pig iron, annual cap., 15,000 tons.

Canaan Furnaces, East Canaan, Conn.: 2 stacks: No. 1, 40' x 9'6", closed top, blt. 1840, rebt. 1880; No. 2, 35' x 9', open top, blt. 1872; warm blast; 2 steam blowing eng.; Sturtevant rotary blowers; 5 tubular boilers, 1,000 H. P. Charcoal; Salisbury brown hematite ore. Product: charcoal pig iron, annual cap., 10,000 tons.

Lime Rock Furnace, Lime Rock, Conn.: 1 stack, orig. blt. 1734, last rebt. 1864: 32' x 9'; open top; warm blast; water power. Charcoal; Salisbury brown hematite ore. Product: charcoal pig iron, annual cap., 5,000 tons.

The company owns and operates the Old Hill iron ore mine at Ore Hill, Salisbury, Conn., with an annual cap. of 20,000 tons. In addition it owns the Davies mine, at Salisbury, now abandoned. Its iron ore holdings in Connecticut amount to about 200 acres. In addition the company owns over 300 acres of iron ore lands in Columbia county, N. Y., on which are located the Weed mine and the Reynolds mine. The company also owns about 50 acres of limestone lands at East Canaan and at Lime Rock, on which it has quarries with an annual cap. of about 4,000 tons.

Basic Steel Co. (The), Niles, Ohio.

Wade A. Taylor, P. & T.; Charles S. Thomas, V. P. & Sc.

Site purchased and construction of open hearth steel plant begun April, 1909; work suspended in fall of 1909.

BASS FOUNDRY AND MACHINE CO. (The), Fort Wayne, Ind.

Org. and inc. 1898. Capital stock: \$1,500,000; bonds, \$460,000.

J. H. Bass, P.; C. T. Strawbridge, V. P.; R. J. Fisher, Sc.; G. M. Leslie, T.; at Fort Wayne, Ind. J. M. Garvin, M. & A. T.; at Rock Run, Ala.

Selling agents: Crocker Brothers, 30 E. 42nd St., New York City; The Dornhoff and Joyce Co., Cincinnati.

Brand: "Rock Run."

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

Owens and operates iron ore mines at Rock Run, Anniston, and Langdon, Ala., and at Cedartown, Ga., (annual cap., 50,000 tons); limestone quarries at Huffaker, Ga., (annual cap., 10,000 tons); 48 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.

Controlled by William S. Rowe, Cincinnati, Ohio.

Brand: "Battelle."

Battelle Furnace: 1 stack, 85' x 19', blt. 1903-4; f. o. Sept. 10, 1904; 4 4-pass Whitwell stoves, 80' x 20'. Fuel, coke; red hematite ore from company's mines near furnace. Connected with the furnace are 150 bee-hive coke ovens; annual cap., 100,000 net tons. *Last active in 1906. For sale.*

Product: foundry pig iron, annual cap., 75,000 tons.

Bayonne Casting Co. (The), Bayonne, N. J.; acquired in 1912 crucible steel casting plant at Astoria, N. Y., formerly operated by Oakley Foundry & Machine Co.; removed machinery to Bayonne in 1912; crucible steel department abandoned in 1915; manufactures nickel, monel, brass, and bronze castings, etc.

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

Org. and inc., 1910. Capital stock: com. auth. \$500,000, issued \$325,000; bonds, \$50,000.

William D. Sargent, P. & T.; A. J. Passino, Sc. & P. A.; H. K. Pollard, G. S. M.; Charles Lidstone, S.

Works at Bayonne, N. J.: blt. 1910; f. o. Aug. 20, 1910; 2 Tropenas converters (2-ton), 2 cupolas. Fuel, coke, anthracite coal and oil. Machine shop for own use. (Formerly operated by Bayonne Steel Casting Co., acquired by Reading-Bayonne Steel Casting Co. Dec. 1, 1911, re-acquired by present company May, 1915).

Product: steel castings for sale, annual cap., 5,000 tons.

BAY VIEW STEEL CASTING CO. (The), Milwaukee, Wis.

M. C. Rice, P.; N. T. Moore, V. P.; T. H. Rice, Sc., T., & G. M.

Works at Milwaukee: blt. 1894, f. o. Nov. 27, 1894; 6 3-pot crucible fur.

Product: crucible steel castings for sale, annual cap., 800 tons.

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

Est. 1855; org. 1902; inc. 1903 as a limited company. Capital stock: com. auth. \$100,000, issued \$62,700; bonds \$5,000.

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

Sales office: Montreal, Quebec, 704 Power Bldg.

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 tons, for engine work, railway purposes, marine and dredging plants, agricultural implements, etc.; blanks for ordnance; annual cap., 1,000 to 1,500 tons.

BECKER STEEL CO. OF AMERICA, Inc., 90 West St., New York, N. Y.
Inc. March 19, 1915; Capital stock: \$750,000; bonds, \$500,000.
Wilhelm Peters, P.; Adolf J. Becker, V. P.; Max Kuch, Sc. & T.
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.; 4 annealing fur.; 7 ham. (500-lb. to 3-ton) with 7 heat. fur.; first rolled products made Mar. 25, 1907. Fuel, nat. gas. (Formerly owned and operated by the Baldwin Steel Co.).

Product: high grade tool steel, steel tubing. Annual cap., 7,000 tons ingots.

BELFONT IRON WORKS CO., Ironton, Ohio.

Org. and inc. Jan. 23, 1863. 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, G. S.; 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, blt. 1868, last rebld. 1904-5, 66' x 16'; 4 Whitwell stoves; 2 steam blowing eng. (20,000 cfm.); 15 flue boilers, 1,000 H. P. Pocahontas and West Virginia coke; Lake and local ore.

Product: Bessemer, foundry, and forge pig iron, annual cap., 60,000 tons.

Rolling Mill blt. 1852, dismantled 1913.

Wire Mill: 51 wire drawing blocks for wire from No. 2 to No. 18 gauge; 65 wire nail machines; 1 galvanizing pan. Cut nail dept. dismantled.

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, P. Q., Canada; blt. a converter steel casting plant corner of Hutcheson and Atlantic Sts., Montreal in 1913. Plant operated June to Sept., 1913, and closed; leased by Standard Steel Co., Ltd., in 1915.

Bellefonte Furnace Co., see 1908 Directory, p. 285. Properties sold at auction March 27, 1914. Blast furnace is being dismantled, see S. & J. Welsh.

Belleville Iron and Horseshoe Co., Ltd., see Canadian Supplement, p. 14, acquired by the Canada Bolt and Nut Co. which was merged in The Steel Company of Canada, July 1, 1910.

Benjamin, Gustave, see Hollidaysburg Iron and Nail Co.

Bentley-Snyder Co., Chicago, Ill.

Works at 3232 West 31st St., Chicago: blt. 1911, f. o. Sept., 1911; 1 Snyder electric fur. (1½-ton), annual cap., 1,500 tons electric steel castings. Sold to Chicago Electric Castings Co., March, 1913; leased by Northwestern Electric Castings Co., Oct. 20, 1913; leased by Finn & Tobin, May 15, 1914; taken over by creditors of Chicago Electric Castings Co. in 1914. Electric furnace bought by Snyder Electric Furnace Co. and removed to Dayton Steel Foundry Co. plant, Dayton, Ohio.

BERGER MANUFACTURING CO. (The), Canton, Ohio.

Org. Dec., 1887; inc. Jan., 1906. Capital stock: com. auth. \$2,500,000, pref. 7% cum. auth. \$2,500,000.

Edward A. Langenbach, P. & G. M.; F. H. Snyder, 1 V. P.; R. H. Yancey, 2 V. P. & G. S. M.; William Langenbach, 3 V. P. & P. A.; Charles W. Krieg, Sc. & T.; A. E. Hockwalt, A. Sc.

Sales offices:

Boston, 160 Broadway Ext.

Chicago, 20 North Market St.

Minneapolis, 300 Tenth Ave.

New York, Cor. 11th Ave. and 22d St.

Philadelphia, 1034 Washington St.

San Francisco, 1120 Mission St.

St. Louis, 16 South 10th St.

Rolling Mill at Canton: blt. 1900-1, f. o. Oct. 1, 1901, enl. 1906-7; 1 jobbing mill 44" to 56" with 1 coal-fired pair and sheet fur.; one open annealing fur.; for plates and sheets 8 to 16 gauge to 50" wide and 150" long; 17 black sheet mills (5 34", 4 36", 8 38") with 11 pair and sheet fur., 6 comb. fur. (fuel, nat. gas); for sheets, 14 to 30 gauge to 36" wide and 144" long; 9 cold mills (8 48", 1 60"); 14 box annealing fur. (fuel, prod. gas). Galvanizing dept. with 10 galvanizing pots.

Product: black and galvanized steel sheets, annual cap., 100,000 tons.

BERKSHIRE IRON WORKS, 45 Wall St., New York City; and Sheridan, Pa.

Org. and inc. Jan. 7, 1905. Capital stock: com. \$550,000; pref. 7% cum. \$550,000.

Walter T. Stern, Sc. & T.; Laird U. Park, A. Sc.; at New York.

Selling agents: Naylor & Co., Inc., 45 Wall St., New York.

Brand "Sheridan."

Sheridan Furnace No. 1 (formerly No. 2) Sheridan, Pa.: 1 stack, 75' x 16', blt. 1874-5; rebld. 1891; 3 fire-brick stoves (2 Ford & Moncur, 60' x 20', 1 Roberts, 80' x 20'); 2 steam blowing eng. (19,000 cfm.); 5 water-tube boilers, 2,000 H. P. Anthracite coal and coke; Cornwall ore. Machine shop for own use.

Product: foundry pig iron, annual cap., 43,000 tons.

Berkshire Iron Works, Pittsfield, Mass., see 1908 Directory, p. 231.
Cheshire Furnace, Cheshire, Mass., acquired Oct. 1, 1908, by Richmond Iron Works.

Bessie Ferro-Silicon Co., formerly operated under lease Bessie Furnace, New Straitsville, Ohio, owned by Columbus and Hocking Coal and Iron Co., see 1908 Directory, p. 368; acquired by Bessie Furnace Co. in 1913.

BESSIE FURNACE CO. (The), 2514 Oliver Bldg., Pittsburgh, Pa. Org. and inc. in 1913. Capital stock: \$300,000.

George S. Davison, P.; W. R. Pomerene, V. P.; Albert P. Meyer, Sc.; Allen S. Davison, T.; Joseph Blankenship, G. S.

Sales agents: Allen S. Davison Co., Pittsburgh, Pa.

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'. Fuel, coke; Lake ore. (Formerly operated under lease by Bessie Ferro-Silicon Co.; acquired by Bessie Furnace Co. in 1913).

Product: 9 to 13 per cent. Bessemer ferro-silicon and silvery iron, annual cap., 18,000 tons.

Best (The C. L.) Gas Traction Co., see Best Steel Casting Co.

BEST STEEL CASTING CO., Elmhurst, Oakland, Cal.

Org. and inc. Aug, 1913. Capital stock: com. auth., \$250,000, issued, \$120,000.

C. L. Best, P.; John Tuohy, G. S.; C. P. Bannon, G. S. M.; at Elmhurst. C. Q. Nelson, V. P.; at Woodland, Cal. H. H. Whiting, Sc. & G. M.; at Sheldon Bldg., San Francisco. Central National Bank, T.; at Oakland, Cal.

Sales office: Sheldon Bldg., San Francisco.

Works at Elmhurst, Oakland: blt. 1910; 1 Whiting side-blown converter (4,000-lb.); f. o. Feb. 21, 1911. Fuel, coke and oil. (Formerly owned and operated by the C. L. Best Gas Traction Co.; acquired by present owners Aug. 1, 1913).

Product: steel castings for sale and own use; also nickel, manganese, and nickel-chrome steel castings. Annual cap., 1,800 tons. Also makes gray iron and semi-steel castings.

Best Steel Casting Company, Ltd., Verdun, Montreal, Canada.

Blt. 1907; abandoned, March, 1908.

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

Inc. Dec. 10, 1904. Capital stock: com., \$15,000,000; pref., \$15,000,000.

Charles M. Schwab, Ch.; James H. Ward, 3 V. P.; at New York City. E. G. Grace, P.; A. Johnston, 1 V. P.; Henry S. Snyder, 2 V. P.; B. H. Jones, Sc. & T.; F. A. Shick, C.; at South Bethlehem, Pa.

Properties :

Bethlehem Steel Corporation owns the capital stock of the following companies :

Bethlehem Steel Co.	Harlin & Hollingsworth Corp.
Pennsylvania Steel Co.	Samuel L. Moore & Sons Corp.
Bethlehem Iron Mines Co.	Titusville Forge Co.
Union Iron Works Co.	Fore River Shipbuilding Corp.

Bethlehem Steel Co., South Bethlehem, Pa. Inc. April 17, 1899.

Capital stock: com., \$15,000,000; bonds \$35,071,500.

E. G. Grace, P.; A. Johnston, Henry S. Snyder, C. A. Buck, V. P.; B. H. Jones, Sc. & T.; F. A. Shick, A; W. F. Roberts, V. P. & G. S., Lehigh Plant; R. F. Randolph, G. S., Saucon Plant; E. S. Knisely, G. S. A.; G. H. Blakely, M. S. (structural); William W. Tobias, P.A.

Sales offices :

Boston, Oliver Bldg.
Chicago, Peoples Gas Bldg.
Cleveland, 1266 Ontario St.
Detroit, Majestic Bldg.
New York, Trinity Bldg., 111 Broadway.
Philadelphia, Morris Bldg.
Pittsburgh, First National Bank Bldg.
San Francisco, Crocker Bldg.

Product : basic, Bessemer, and foundry pig iron ; O. H. ingots, blooms, billets; nickel, nickel-chrome, chrome-vanadium steel bars; spring, screw, file, and tool steel; muck bar, staybolt and engine bolt iron; special wide-flange rolled beams, rolled girders, and rolled column shapes of H section, I beams, channels, angles, other standard forms of structural shapes; O. H., nickel-steel, and nickel-chrome steel rails; steel forgings, marine and stationary engine cranks, shafting, gun carriages, heavy and light ordnance of all calibres, forged armor plate, armor plate vaults, projectiles.

Properties : Bethlehem Steel Co. owns the Lehigh and Saucon Plants at South Bethlehem and the capital stock of the Juragua Iron Co. and the Bethlehem Chile Iron Mines Co.

Lehigh Plant, South Bethlehem, Pa.

BLAST FURNACES.

Furnace.	Built.	Last Rebuilt.	Present Size.	No.	Stoves.		First Blown In.
					Kind.	Size.	
A	1866	1914	90' x 22'	5	McClure	100' x 22'	1867
B	1874-5	—	70' x 18'	{ 1	McClure	100' x 22'	Mar. 17, 1876
				{ 4	Whitwell	90' x 18'	
C	1874-5	1914	80' x 18'	{ 1	McClure	100' x 22'	1877
				{ 4	Whitwell	70' x 18'	
D	1881	1909	90' x 22'	5	McClure	100' x 22'	1883
E	1906	—	90' x 22'	5	McClure	100' x 22'	Apr. 22, 1907
F	1910	—	90' x 22'	5	McClure	100' x 22'	Mar. 15, 1911
G	1910-1	—	90' x 22'	5	McClure	100' x 22'	July 30, 1911

14 blowing engines (11 Bethlehem gas and 3 Southwark horizontal vertical steam, 410,000 cfm.); 74 water-tube boilers (68 B. & W. and 6 Rust), 21,400 H. P. By-product coke; local and foreign hematite and magnetic ores. Bethlehem circular pig iron casting machine and 1 Uehling double-strand casting machine (adding a second Uehling casting machine). Molten metal to the O. H. furnaces. Rebuilding Furnace B, 90' x 22'.

Product: basic, Bessemer, and foundry pig iron, annual cap., 1,000,000 tons.

FOUNDRIES.

At South Bethlehem, Pa., the company operates a gray iron foundry with 6 cupolas, an ingot mould foundry, a brass foundry, and a steel foundry; annual cap., 10,000 tons iron castings, 50,000 tons ingot moulds, 20,000 tons O. H. steel castings for sale and for own use (14,000 tons basic, 6,000 tons acid), and 1,200 tons brass castings.

OPEN HEARTH STEEL, FORGE, ARMOR PLATE, AND MISCELLANEOUS DEPARTMENTS.

Open Hearth Steel Department: 4 A. O. H. fur. (10, 15, 20, 40-ton); 7 B. O. H. (2 30-ton, 3 40-ton, 2 50-ton) and one pre-heater; first A. O. H. steel made Aug. 11, 1888; first B. O. H. steel made Jan. 3, 1893; an ingot weighing 350,000 lbs. has been cast; annual cap., 40,000 tons of acid and 150,000 tons of basic ingots. Fuel, mfd. gas. Six 50-ton B. O. H. fur. at mill No. 2, Lehigh Plant, added in 1915, with an estimated annual cap. of 180,000 tons. One 10-ton Girod electric fur., construction commenced 1913, completed in 1915.

Forge and Armor Plate Department: connected with the O. H. fur. is a plant for the fluid compression of steel (press taking an 18' ingot); a forging plant with 3 hydraulic forging presses (2,500, 5,000, and 14,000 tons pressure), 17 ham. for making small forgings ranging from 1,100 lbs. to 8 tons; 300-ton straightening mach.; 7,000-ton bending press for heavy armor; 3 oil-tempering and annealing plants (2 for gun and other forgings and 1 for armor plate); and a plant for treating armor by the cementation process. These plants contain 21 coal-fired and 32 gas-fired heat. fur. supplied with gas by 52 gas prod.

Product: steel forgings of all descriptions and of largest dimensions and weight, marine and stationary engine cranks (forged solid or built up), shafting (forged solid or hollow), gun carriages, heavy and light ordnance of all calibres, forged armor plate, and projectiles of all sizes. The department is fully equipped with all necessary appliances and machinery for filling the requirements of the Government and ship and engine builders for heavy steel shafting and miscellaneous forgings of the best quality. Total annual cap. of armor plate department, 12,000 tons.

Crucible Steel Plant: 2 30 and 2 36-pot steel melting fur.; annual cap., 9,000 tons ingots. 16" 3-h. 1-st. roughing, 12" finishing with 5 3-h. and 1 2-h. st. (tandem); 12" 3-h. 1-st. roughing, 9" finishing with 5 3-h. and 1 2-h. st. (tandem). Forge shop equipped with the necessary furnaces and hammers.

Machine Shops: 7 machine shops; 5 for general work, rough-machining and finishing forgings, and for heavy ordnance; one for trimming and machining armor plates; and one for machining projectiles up to 16".

Drop Forge Plant for the manufacture of all kinds of drop forgings added in 1905, specialty automobile forgings of special steels.

The company also builds specially designed machinery, including large gas engines up to 5,000 H. P., tire mills, wheel rolling mills, planing and upsetting machines, hydraulic presses, shears, riveters, large pumping engines, etc.

Fuse Plant and Proving Ground. At Redington, Pa., on the Lehigh Valley R. R., the company has a fuse plant and a complete proving ground for armor plate and ordnance up to 14" guns.

Cartridge case plant and projectile loading plant.

ROLLING MILLS AND STEEL WORKS.

Lehigh Plant, South Bethlehem, Pa.: established 1860; rolling mill started 1863 to roll iron rails; Bessemer steel works added 1873; dismantled 1902-4.

Mill No. 1: 13 double puddling fur.; 8 heat. fur.; 4 trains (22" 3-h. 2-st. puddle, 22" 3-h. 2-st. finishing, 16" 3-h. 1-st. roughing, 12" finishing with 3 3-h. and 1 2-h. st.; the 16" and 12" mills will be used for tool steels. The other mills for iron.

Mill No. 2: 6 B. O. H. fur. (50-ton) completed 1915; see O. H. Dept. above; 8 trains (35" 2-h. 1-st. blooming, 18" 2-h. 6-st. cont. Morgan billet, 22" finishing with 3 3-h. and 1 2-h. st., 12" 3-h. 1-st. roughing, 8" finishing with 5 3-h. and 1 2-h. st., 16" 3-h. 2-st. roughing, 12" finishing with 5 3-h. and 1 2-h. st., 10" finishing with 5 3-h. and 1 2-h. st.); heat-treating and cold-drawing department; machine repair shop. Hughes mechanical gas prod. used at mills and O. H. All mills will be motor driven. Current is supplied at 6,600 volts by Bethlehem gas engines running on blast furnace gas. Fuel, bituminous coal.

Product: O. H. steel blooms, billets; nickel, nickel-chrome, chrome-vanadium steel bars; spring, screw, file, and tool steel; muck bar, staybolt and engine bolt iron, etc. Annual cap., 15,000 tons of muck bar and 650,000 tons of finished rolled products.

Saucon Plant, South Bethlehem, Pa., located east of Lehigh Plant: construction commenced Mar., 1906; first steel made August 12, 1907.

Open Hearth Department: 16 B. O. H. fur. (10 50-ton; 6 75-ton);

11 4-hole soaking pits; 3 heat. fur.; 3 metal mixers (250, 400, 1,000-ton); 85 gas prod. Coke oven gas is used in soaking pits and heat. fur.

Bessemer Converters: 2 20-ton Bessemer converters for desiliconizing and decarburizing molten metal for the O. H. fur. completed in 1911 and first duplex steel made Feb. 18, 1911.

Rolling Mill Department: 46" 2-h. 2-st. blooming mill; 48" 2-h. 2-st. intermediate mill; 48" 2-h. 2-st. finishing mill, daily capacity of 1,000 tons of wide-flanged beams, etc.; 40" 2-h. 1-st. blooming mill; 28" rail mill with 1 2-h. roughing and 1 3-h. and 1 2-h. st. finishing, daily cap., 1,000 tons of rails; 28" 3-h. structural mill with 1 3-h. roughing and 1 3-h. and 1 2-h. st. finishing, daily cap., 400 tons of beams and channels up to 15" deep and angles from 3" to 8" inclusive. First rails rolled Aug. 31, 1907; first structural shapes, June 8, 1908.

Product: special wide-flanged rolled beams, rolled girders, and rolled column shapes of H section; O. H. nickel-steel, and nickel-chrome steel rails; O. H. billets, I beams, channels, angles, and other standard forms of structural shapes.

A fabricating shop, electric light and power plant, machine shop, roll shop, etc., are connected with the works.

Total annual cap. of Saucon rolling mills and steel works, 750,000 tons of O. H. ingots, 360,000 tons of rails, 300,000 tons of Grey beams, 120,000 tons of beams and channels, 50,000 tons of fabricated materials.

Under construction: 12" structural mill, 18" structural mill, with 2 3-h. and 1 2-h. st., 4 4-hole soaking pits, steam plants, etc., to be completed by end of 1916.

IRON ORE MINES, LIMESTONE QUARRIES, ETC.

Juragua Iron Co.; main office at South Bethlehem, Pa.; mines office at Santiago, Cuba. Capital stock: \$600,000, all owned by the Bethlehem Steel Co.

H. S. Snyder, P.; A. Johnston, V. P.; D. B. Whitaker, V. P. & G. M.; B. H. Jones, Sc. & T.; F. A. Shick, A.; A. T. de Serrano, G. S.

The Juragua Iron Co. owns 10,000 acres of land at and near Firmeza in the Province of Santiago, Cuba. It has 17 iron-ore mines in operation on the property, with an annual output of about 300,000 tons. It also owns 40 miles of railroad and 20 miles of mining track, 12 large and 27 small locomotives, and 1,300 cars.

Bethlehem Chile Iron Mines Co.; main office at South Bethlehem, Pa.; mine office at Tofo, Coquimbo, Chile. Inc. Jan. 18, 1913. Capital stock: com. auth., \$4,000,000, issued, \$642,500 (owned by the Bethlehem Steel Co.).

C. A. Buck, P.; H. Merryweather, V. P. & G. M.; B. H. Jones, Sc.

& T.; F. A. Shick, A.; William M. Tobias, P. A.; Thomas O. Cole, T. M.

Bethlehem Chile Iron Mines Company controls large holdings of rich iron ore lands at Tofo, near Coquimbo, Province of Coquimbo, Chile. The ore contains 67% iron and is low in phosphorus. Electric railroad, docks, power and crushing plants are being installed to mine 1,500,000 tons of ore per year.

The Bethlehem Steel Co. also operates limestone quarries at McAfee, N. J., and Redington, Pa., with an annual cap. of 400,000 tons. Its limestone holdings amount to 316 acres.

Union Iron Works Co.; executive office, 260 California St., San Francisco; general offices, 20th & Michigan Sts., Potrero, San Francisco. Org. and inc. Dec. 16, 1904. Capital stock: com., \$2,000,000.

John A. McGregor, P.; Joseph J. Tynan, V. P. and G. M.; Arnold Foster, Sc. & T.; Mark P. Geirrine, P. A., at San Francisco. B. H. Jones, A. Sc. & A. T. at So. Bethlehem, Pa.

Sales office: San Francisco, Cal., 260 California St.

Forging Plant and Shipbuilding Yards at 20th & Michigan Sts., Potrero, San Francisco.

Product: iron and steel forgings for use of the company in mining and shipbuilding. Also build engines, boilers, battleships, steamships, steam tugs, etc. Dry docks are connected with the works. Also a large bending press for handling and shaping heavy steel plates for ship work. (One 2-ton Tropenas steel converter blt. 1899; f. o. Nov. 4, 1899; dismantled).

Harlan and Hollingsworth Corp., Wilmington, Del. Org. and inc. Jan. 12, 1905. Capital stock: com. auth., \$1,500,000, issued, \$1,410,000; debenture bonds outstanding, \$270,000.

W. G. Coxe, P.; S. K. Smith, V. P. & T.; Henderson Weir, Sc.; William T. Budd, A.; C. S. Hoyt, G. S.; F. H. Megaw, P. A.; at Wilmington. B. H. Jones, A. Sc. & A. T.; at So. Bethlehem, Pa. Foreign selling agents: London, E. C., England, 36 Lime St., Norton, Megaw & Co., Ltd.; Rio de Janeiro, Brazil, Norton, Megaw & Co., Ltd.

Product: all kinds of parlor, sleeping, dining, private, passenger, baggage, and mail cars with wooden, iron, or steel frames. Sectional work for export a specialty. Also builds all kinds of vessels, engines, boilers, etc. Dry dock connected with the shipbuilding yards. Also makes iron castings, general machinery, etc.

Samuel L. Moore and Sons Corporation, Elizabeth, N. J. Org. Dec. 16, 1904; inc. Jan. 7, 1905. Capital stock: com., \$900,000.

Frederick Conlin, P. & G. M.; George L. Wodey, Sc., T., & P. A.; Robert J. M. Welch, G. S.; at Elizabeth, N. J. Henry S. Snyder, V. P.; at South Bethlehem, Pa.

Sales offices: Chicago, Ill., 537 South Dearborn St.; New York City, 111 Broadway.

The Crescent Shipyard Corporation and the Carteret Improvement Co. were merged with this company in 1907.

Product: iron castings, oil engines, filter presses, vessels of all kinds.

Titusville Forge Co., Titusville, Pa. Org. April 25, 1913; inc. April 29, 1913. Capital stock: com. auth., \$100,000, issued, \$50,000; bonds, \$360,000.

J. T. Dillon, P.; J. T. Dillon, Jr., V. P., T., & G. M.; G. O. Gondree, A. T., A. Sc., & M. S.; J. M. Cartney, S.; F. R. Whitcomb, P. A.; at Titusville, Pa. T. H. Fatzinger, Sc.; at South Bethlehem, Pa.

Selling agents: Milwaukee, Wis., First National Bank Bldg., L. E. Meidinger; New York City, 11 Broadway, C. M. Wales.

Product: general merchant forgings.

Detrick and Harvey Machine Co. (The), Baltimore, Md.

Acquired by Bethlehem Steel Co., August 17, 1915.

W. F. Roberts, V. P.; B. H. Jones, Sc. & T.; F. A. Shick, A.; at Bethlehem. J. W. Neidhardt, V. P. & G. M.; G. W. Schanberger, A. T.; at Baltimore.

Product: machine tools and special machinery.

Fore River Shipbuilding Corporation, 107 E. Howard St., Quincy, Mass. Org. and inc. May 15, 1913. Capital stock: com. auth. \$1,000,000, issued, \$750,000; bonds \$750,000.

Joseph W. Powell, P.; Henry G. Smith, 1 V. P. & G. M.; Henry Brown, 2 V. P.; Joseph A. Sedgwick, Sc. & T.; Edward B. Hill, A.; S. W. Wakeman, G. S.; J. W. Hendry, G. S. M.; J. F. Kemp, P. A.; at Quincy, Mass. F. A. Shick, C.; at South Bethlehem. Equipped to construct steel vessels of all types and sizes for naval and commercial use; also to repair ships. Manufactures marine turbines, boilers, engines, composition castings, sheet metal work; equipped with cranes and wet docks for fitting out ships. Also equipped for machining, galvanizing, electric and gas welding, pattern-making of all kinds, etc.

Eastern Shipbuilding Corporation, former subsidiary of the Bethlehem Steel Corporation, was dissolved and plant dismantled and sold in 1907.

BETTENDORF CO. (The), Bettendorf, Iowa.

Original company org. Jan. 1, 1895; present company inc., Jan. 1, 1913. Capital stock: com., \$5,000,000; pref. 7% cum., \$2,500,000.

J. W. Bettendorf, P. & T.; M. Bettendorf, 1 V. P.; J. H. Bendixen, 2 V. P. & G. S. M.; R. H. Parks, G. M.; P. Bendixen, G. S.; F. M. Goddard, P. A.; at Bettendorf. C. N. Voss, Sc.; at Davenport, Iowa.

Sales offices: McCormick Bldg., Chicago; Grand Central Terminal Bldg., New York.

Works at Bettendorf: blt. 1909; first steel made April 19, 1910; 5 B. O. H. fur. (25-ton). Fuel, crude oil. (Formerly the Bettendorf Axle Co.; corporate title changed to The Bettendorf Co., Feb. 22, 1913).

Product: steel castings for the use of the company in the manufacture of freight car equipment. Annual cap., 60,000 tons. Manufacturer of steel and wooden cars, trucks, underframes, bolsters, and car specialties.

Bird Iron Co. (The), see 1908 Directory, p. 363: receiver appointed Dec., 1909; property sold at auction Jan. 14, 1910: Lawrence Iron Co. formed to take over the property, acquired same Feb. 21, 1910: Lawrence Iron Co. acquired by Marting Iron and Steel Co., Sept. 1, 1912.

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

Inc. Nov., 1894. Capital stock: com. auth., \$500,000, issued, \$420,000; pref. auth., \$500,000, issued, \$420,000.

Robert E. Brooke, P.; George Brooke, V. P.; D. Owen Brooke, Sc. & T.; Leon E. Thomas, G. M.

Works at Birdsboro: blt. 1901-3; steel plant; 2 A. O. H. fur. (20 and 25-ton); f. o. Mar., 1903. Fuel, prod. gas and oil. Annual cap., 7,500 tons. Iron foundry: 2 cupolas, 1 air furnace, annual cap., 6,500 tons. Roll foundry (building); 2 air furnaces; 1 cupola; annual cap., 7,500 tons.

Product: steel castings for locomotives, ships, rolling mills, bridges, electrical machinery, etc., for sale and for own use. Gray iron castings for general machinery manufacture. Sand, chilled steel and alloy rolls. Also does a general foundry and machine business.

Birmingham Coal and Iron Co., Birmingham, see 1908 Directory, p. 347. Vanderbilt Furnaces acquired April 1, 1912, by Woodward Iron Co.

Birmingham Steel and Iron Co., Birmingham, Ala., see 1908 Directory p. 351, formerly owned and operated a steel casting plant at Birmingham, Ala. Plant sold to W. T. Adams, Corinth, Miss., in June, 1913.

Black Sand and Gold Recovery Co., see 1908 Directory, p. 404. Electric fur. for pig iron from black sand abandoned.

Blue Island Rolling Mill and Car Co., see 1910 Supplement, p. 28. In March, 1909, the Blue Island Car & Equipment Co. began the construction of a rolling mill at 123rd St. and Marshfield Ave., Chicago. On April 1, 1910, the company was reorganized with the title of Blue Island Rolling Mill & Car Co. The rolling mill was

purchased by the Highland Iron and Steel Co. August 25, 1910, and is now known as the West Pullman Works of that company.

BLUE RIDGE IRON CO., Rock Run, Ala.

Org. and inc. Aug., 1913. Capital stock: \$30,000.

J. H. Bass, P.; at Fort Wayne, Ind. J. M. Garvin, V. P. & G. M.;

D. J. Garvin, Sc. & T.; at Rock Run, Ala.

Sales office: Tallapoosa, Ga.

Brand: "Blue Ridge."

Blue Ridge Furnace, Tallapoosa, Ga.: 1 stack, 53' x 10', blt. 1888-9, rebt. 1913; 1 Player iron stove; closed top; cold and warm blast; 2 steam blowing eng. (8,000 cfm.); 2 tubular boilers, 250 H. P. Charcoal; brown hematite ore mined by the company. 6 charcoal kilns, annual cap., 200,000 bushels. (Formerly owned and operated by Southern Car Wheel Iron Co.; acquired by present owners April, 1913).

Product: charcoal pig iron for car wheels, chilled rolls, and malleable castings, annual cap., 13,500 tons.

BOERDER STEEL CO. (The), Toledo, Ohio.

Org. and inc. in 1914. Capital stock: com. auth. \$200,000; pref. 6% cum. auth. \$200,000.

Anton Boerder, P. & G. M.

Works at Woodville St. & W. & L. E. Belt, Toledo: blt. 1914, f. o. Dec. 1, 1914; 4 6-pot crucible fur. Fuel, oil. Building 1 2-ton converter.

Product: crucible steel castings for sale, annual cap., 950 tons.

BON AIR COAL AND IRON CO., Stahlman Bldg., Nashville, Tenn.

Org. and inc. 1902. Capital stock: com. auth., \$2,500,000, issued, \$1,887,000; pref. 6% cum., auth., \$2,500,000, issued, \$1,887,000; bonds, \$1,680,000.

Robert Vaughn and E. C. Lewis, Receivers (since June 1, 1910).

John P. Williams, P.; J. M. Overton, V. P. & G. M.; C. Cooper, Sc., T. & P. A.

Selling agents: Rogers, Brown & Co.

Brands: "Mannie" for extra-fluid softeners and "Wayne" for low-phosphorus iron.

Mannie Furnaces, Allens Creek, Tenn.: 2 stacks, 60' x 12'; blt. 1892-3. No. 1 f. o. April 22, 1893; No. 2 soon afterwards; 6 Gordon hot-blast stoves; 2 steam blowing eng. (17,250 cfm.); 8 water-tube boilers, 1,300 H. P. Coke; local brown hematite ore from company's mine at Allens Creek, annual cap., 100,000 tons. Machine shop for own use.

Owns 200 bee-hive coke ovens at Eastland, Tenn., annual cap., 80,000 net tons of coke.

Product: high-phosphorus and high-silicon (3 to 10% Si.) pig iron; also foundry iron (0.70 to 0.85 P.). Annual cap., 72,000 tons.

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

Org. and inc. 1906.

John 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) added 1914. Fuel, nat. gas. Machine shop for own use.

Product: steel castings for sale; also alloy steel castings. Annual cap., 4,800 tons of converter, and 7,200 tons of O. H. castings.

Boonton Iron and Steel Co., Boonton, N. J. See 1908 Directory, p. 252. Plant abandoned and partly dismantled.

BRADDOCK MACHINE AND MANUFACTURING CO., Braddock, Pa. Org. and inc. 1899.

A. R. Peacock, P.; James Watt, V. P. & T.; Hugh Aiken, Sc. & A. T.; at 2209 Oliver Bldg., Pittsburgh. F. B. McConnell, M.; F. C. Sullivan, G. S. M. & P. A.; at Braddock.

Works at Braddock: blt. 1909; 1 A. O. H. fur. (20-ton) f. o. Nov. 5, 1909. Fuel, nat. gas. Machine shop for jobbing.

Product: steel castings for sale for all purposes from 5 to 30,000 lbs. Annual cap., 4,800 tons.

Bradley (David) Manufacturing Co., see 1908 Directory, p. 383. Works sold to Sears, Roebuck & Co., Chicago, in 1910. Open hearth fur. dismantled in 1909; crucible steel fur. abandoned in 1910. No longer make steel.

BRAEBURN STEEL CO., Braeburn, Pa.

Inc. April 12, 1897. Capital stock: com. auth., \$400,000, issued, \$337,000.

William Metcalf, Jr., P.; at Pittsburgh. George H. Neilson, Sc., G. M., & P. A.; J. R. Bell, T.; Frank P. Case, G. S. M.; at Braeburn.

Sales offices:

Boston, 40 Central St., McMinn & Quigley Steel Co. (agents).

Chicago, 714 West Lake St.

Cleveland, 911 Citizen's Bldg.

New York, 573 Hudson Terminal Bldg.

Philadelphia, 639 Real Estate Trust Bldg.

Pittsburgh, 1410 Henry W. Oliver Bldg.

San Francisco, 71 First St., Eccles & Smith Co. (agents).

Brands: Grade "1" to "7", "High Speed", "High Speed Special", "Gyro", "Self Hardening", "Wesco".

Works at Braeburn: blt. 1897; f. o. Oct. 1897; 8 heat. fur. (2 1-d., 4 3-d., 2 4-d. coal-fired); 2 trains (10" 3-h. 5-st. and 14" 3-h. 5-st. bar); 6 steam ham. (500-lb. to 3-ton); 500-ton steam hydraulic forging press; 2 Siemens crucible fur. (24-pot and 36-pot), annual cap. 4,000 tons of ingots; first crucible steel made Nov., 1897.

Fuel, nat. and mfd. gas and coal. Adding 6-ton Heroult electric steel fur., annual cap., 7,200 tons ingots; will probably be completed in spring of 1916. Machine shop for own use.

Product: bar and tool steel. Annual cap., 15,000 tons of rolled and forged products. Also high speed, tungsten, and high silicon ingots.

BRENNAN STEEL CASTINGS CO., 2284 Scranton Road, Cleveland, Ohio.

Org. and inc. 1914. Capital stock: com. \$60,000.

T. M. Brennan, P., G. M., & P. A.; Delo Mook, V. P.; C. H. Judkins, Sc.; Joseph Schaffer, T.

Works at Cleveland: blt. 1912-13; 2 Calumet steel converters (1 and 2-ton) ; 3 12-pot crucible fur.; first converter and first crucible steel made 1913. Fuel, oil and coke. (Formerly called Brennan-Smyth Steel Casting Co).

Product: steel castings for general purposes for sale. Annual cap., 3,000 tons converter and 900 tons crucible steel castings.

Brier Hill Iron and Coal Co. (The), Youngstown, Ohio. Grace Furnace at Youngstown, see 1908 Directory, p. 355, acquired by The Brier Hill Steel Co. Feb. 1, 1912 (1912 Supplement, p. 57).

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

Inc. Jan. 29, 1912; org. Feb. 1, 1912. Capital stock: com. auth. \$10,000,000, issued \$9,107,000; pref. 7% cum. auth. \$5,000,000, issued \$4,940,200; bonds \$2,000,000.

H. H. Stambaugh, Ch.; W. A. Thomas, P.; John Tod, J. G. Butler, Jr., V. P.; R. C. Steese, V. P. & G. M.; J. E. Parker, Sc.; John Stambaugh, T.; C. H. Rose, A.; P. H. Hubbard, G. S. M.; John Allen, P. A.

Sales offices:

Chicago, 3604 South Morgan St., Joseph A. Rees.

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

Fort Worth, Texas, 308 Texas State Bank Bldg., Calkins & Patton.

Hamilton, Ontario, 148 Jackson St., West, John McCullough.

Kansas City, Mo., 305 R. A. Long Bldg., D. S. Rettig.

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

Memphis, Tenn., John T. Everett.

New York, 521 West 23rd St., W. C. Dickey.

Philadelphia, Land Title Bldg., Charles E. McInnes.

Phoenix, Arizona, 323 West Washington St., J. V. Williams.

Salt Lake City, Utah, Utah Savings & Trust Bldg., E. C. Coffin.

San Antonio, Texas, Brady Bldg., Johnson-Griffith Lumber Co.

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

Youngstown, Fred Tod.

Brand: "Service, The Brier Hill Steel Co., Youngstown, O." in a circle.

Properties: On Feb. 1, 1912, the company acquired the properties of the following companies:

The Brier Hill Iron and Coal Co., Youngstown, Ohio.

The Youngstown Steel Co., Youngstown, Ohio.

The Thomas Steel Co., Niles, Ohio.

The Empire Iron and Steel Co., Niles, Ohio.

The Garry Iron and Steel Co., Niles, Ohio.

Product: Bessemer, basic, and malleable pig iron, ingots, billets and sheet bars, steel sheet specialties, sheets from No. 10 to 30 gauge, shovel steel, cutlery steel, galvanized steel sheets for roofing, metal shingle, conductor pipe, metal ceiling, galvanized corrugated and painted corrugated roofing and flat galvanized and flat black sheets.

BLAST FURNACES.

Grace Furnace, Youngstown: 1 stack, 85' x 20' 6", blt. 1890, rebt. 1908; 4 Massicks & Crooke stoves, 90' x 22'; 3 steam blowing eng. (36,000 cfm.); 12 water-tube boilers, 3,000 H. P. Conn. coke; Lake ore. Double-strand Heyl & Patterson casting machine. Slag granulating pit, annual cap., 75,000 tons of slag sand. Machine shop for own use. (Formerly operated by The Brier Hill Iron and Coal Co.) Product: Bessemer, basic and malleable pig iron, annual cap., 165,000 tons.

Tod Furnace, Youngstown: 1 stack, 80' x 20' 6", blt. 1889, last rebt. 1913; 5 Massicks & Crooke stoves, 80' x 16' 6"; 3 steam blowing eng. (35,000 cfm.); 12 water-tube boilers, 3,000 H. P. Conn. coke; Lake ore. 1 Pernot revolving fur. (10-ton) for washed metal, annual cap., 40,000 tons. Slag granulating pit, annual cap., 75,000 tons of slag sand. Machine shop for own use. (Formerly operated by the Youngstown Steel Co.) Product: Bessemer and basic pig iron, annual cap., 146,000 tons.

Total annual cap. of blast furnaces, 311,000 tons.

STEEL WORKS AND ROLLING MILLS.

Open Hearth Steel Works, Youngstown. Construction commenced May 1, 1912; first steel made Nov. 1, 1913; first products rolled Feb. 7, 1914; 8 B. O. H. fur. (75-ton); adding 2 B. O. H. fur. (100-ton); 6 soaking pits (4-hole); 1 metal mixer (600-ton); 3 trains (40" 2-h. 1-st. reversing blooming mill, 24" 2-h. 6-st. continuous billet mill, 24" 2-h. 6-st. finishing bar mill). Fuel, coal and nat. and prod. gas. Machine shop for own use.

Product: ingots, billets and sheet bars. Annual cap., 400,000 tons of ingots, to be increased to 560,000 tons by furnaces building, 300,000 tons of billets and sheet bars.

Empire Works, Niles, Ohio: blt. 1902, f. o. Oct., 1902; 10 black sheet mills, 3 roughing and 7 finishing (2 44", 4 38", 4 34"); 34" black plate mill; 7 pair and 7 sheet fur., 1 comb. fur.; 3 single-stand cold mills (1 48", 2 40"); 10 box annealing fur.; 6 pickling

tanks; 4 galvanizing pots (36,000 tons). Fuel, coal. Busheling and bar fur. dismantled 1913. Machine shop for own use. (Formerly operated by the Empire Iron and Steel Co. which company was controlled by the Garry Iron and Steel Co.)

Product: black and galvanized sheets, sheets 10 to 30 gauge, sheet steel specialties, shovel steel and cutlery steel, annual cap., 38,000 tons.

Thomas Works, Niles, Ohio: blt. 1901, f. o. May, 1901; 17 black sheet mills, 5 roughing and 12 finishing (2 48", 2 40", 13 36"); 12 comb. heat. fur.; 6 cold mills (1 58", 5 48"); 18 box annealing fur.; 8 pickling tanks; 6 galvanizing pots (55,000 tons). Fuel, coal. Machine shop for own use. (Formerly operated by the Niles Iron and Steel Co.; acquired by the Thomas Steel Co., Feb. 1, 1909).

Product: black sheets, flat and corrugated, galvanized sheets, standard sheets, galvanized and painted roofing sheets, annual cap., 60,000 tons.

COKE OVENS, ETC.

The company owns the Brier Hill Coke Co. which owns about 800 acres of coking coal and owns and operates 470 bee-hive coke ovens at Brier Hill, Fayette County, Pa., with an annual cap. of 360,000 net tons of coke. The company also owns the Redstone Central R. R. Co. connecting the coke property with other railroads. Construction of a by-product coke plant to consist of 84 Koppers ovens begun in Jan., 1916, annual cap., 300,000 net tons.

Bristol Iron and Steel Co., see 1908 Directory, p. 261. Bristol Rolling Mill at Bristol, Pa., acquired in 1909 by Iron and Steel Products Co.; acquired by Frank Samuel, May 19, 1911, and dismantled completely Oct. 1, 1911.

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; L. K. Walter, S. Nail Works.

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

Brand: "Brooke" for pig iron, "Anchor" for rolled product.

Product: foundry, forge and basic pig iron, nails, muck bar, and skelp.

Brooke Furnaces, Birdsboro: 1 stack; No. 3, blt. 1873, rebt. 1910, 75' x 17', 3 Roberts and 1 Whitwell stove. Coke; Lake, foreign, French Creek, New York and New Jersey magnetic ore. (No. 2, blt. 1871, dismantled 1915.) Dwight & Lloyd sintering plant, annual cap., 70,000 tons. Plan to install a pig iron casting machine. Product: foundry, forge and basic pig iron, annual cap., 85,000 tons.

Birdsboro Nail Works, Birdsboro: blt. 1848; 16 double puddling fur., 4 heat. fur., 2 trains (20" 3-h. muck and 24" skelp and nail plate), 118 cut nail machines; steam and water power. Electroplate galvanizing plant. Fuel, bituminous coal. (2 small Bess. converters abandoned). Product: nails, muck bar, and skelp. Annual cap., 250,000 kegs cut nails, 16,500 tons muck bar and skelp.

BROWN & CO., INC., Pittsburgh, Pa.

Org. 1825; inc. 1891. Capital stock: com., \$500,000.

J. Stuart Brown, P. & T.; Henry Graham Brown, V. P.; James Neale, Sc.

Sales offices: Chicago, 123-25 N. Jefferson St.; New York City, 50 Church St.; St. Louis, Railway Exchange Bldg.

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.

Inc. Feb. 2, 1888. Capital stock: \$625,000.

Mrs. Jessica W. Holton, P.; H. Morley Holton, Sc. & T.; Paul E. Miller, G. M.; William M. Brezette, G. S. M.

Brands: "Boss" and "Banner."

Works at Catasauqua: est. 1882; rolling mill added 1889-90, f. o. April, 1890; 4 4-d. heat. fur.; 4 trains (20" 3-h. 1-st. breakdown, 10" 3-h. 4-st. finishing, two 9" 3-h. 4-st. finishing); 12 reheat. fur.; 12 benders, 12 pressers, 4 ham. (1,200 lb.). Fuel, bit. and anth. coal.

Product: horse and mule shoes, racing and trotting plates. Horse-shoe bars for own use.

BRYLSON STEEL CASTING CO., New Castle, Del.

Inc. Oct., 1902; org. Nov. 10, 1914. Capital stock: com. auth., \$500,000; issued, \$227,000.

Andrew Bryson, P.; David S. Cann, V. P.; John T. Dickson, Sc. & T.

Works at New Castle: blt. 1903-4; f. o. Sept. 22, 1904; 4 3-ton modified Tropenas converters and 2 cupolas. Fuel, coal, coke, and oil.

Product: cut-gear blanks, connecting rods, crank shafts, crossheads, low-carbon motor frames and poles, electrical and other steel castings for sale and for own use. Annual cap., 6,000 tons.

BUCHANAN ELECTRIC STEEL CO., executive office, 631 Railway Exchange, Chicago; main office, Buchanan, Mich.

Inc. 1910. Capital stock: com. auth., \$190,000, issued, \$120,000; pref. 8% cum. auth., and issued, \$60,000.

Eugene B. Clark, P.; H. A. Brassert, V. P.; at Chicago. N. M. Carleton, Sc. & T.; E. B. Ross, M.; at Buchanan.

Works at Buchanan: construction commenced July, 1911, and completed 1912; originally equipped with 1 6-pot crucible steel-melting fur.; two 1½-ton special electric steel-melting and refining fur.; crucible steel first made Feb., and electric steel April, 1912. Crucible fur. have been dismantled and the two 1½-ton electric fur. replaced with one 4½-ton electric fur. and one 2-ton Heroult electric fur. Fuel, electricity.

(Works at Gibson & Alexandrine Aves., Detroit. Blt. 1910, acquired from the Peerless Crucible Steel Casting Co., dismantled 1912. The company also had a partly erected steel casting plant at Oakman Ave. and the Detroit Terminal Ry., Detroit; plant acquired and completed by the Stock Process Steel Co.)

Product: high-grade steel castings for sale; specialty, steel wheels for motor trucks and similar vehicles; ingots of special analyses including alloys. Annual cap., from 3,000 to 4,000 net tons of castings.

BUCKEYE ROLLING MILL CO. (The), Steubenville, Ohio.

Org. and inc. Aug. 5, 1909. Capital stock: com., \$100,000.

Isaac M. Scott, P.; J. T. Sarratt, Sc., T., G. M., G. S. M. & P. A.; at Steubenville. P. W. Jones, G. S.; at Newark, Ohio.

Sales offices: Chicago, Peoples Gas Bldg.; St. Louis, New Bank of Commerce Bldg.

Newark Rolling Mills, Newark, Ohio: blt. 1897; rebt. 1907; first rail rerolled, Aug. 22, 1907; cont. rail heat. fur.; 18" 3-h. rail train with 1-st. of roughing and 1-st. of finishing rolls. Fuel, nat. gas and coal. (Formerly called Newark Steel Plant and owned and operated by the Ohio Rail Co.; acquired by present company, June 26, 1909).

Product: rerolled steel rails, annual cap., 36,000 tons.

BUCKEYE STEEL CASTINGS CO. (The), South Parsons Ave., Columbus, Ohio.

Inc. Nov. 19, 1894. Capital stock: com., \$1,500,000; pref. \$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, A. G. M.; J. E. Finneran, P. A.; at Columbus. Frank Rockefeller, 2 V. P.; at Cleveland. C. B. Goodspeed, 3 V. P.; at Chicago.

Sales offices: Chicago, 619 Railway Exchange Bldg.; New York City, 50 Church St.; St. Paul, 817 Merchants Bank Bldg.

Plant at South Columbus: blt. 1901-02; f. o. Nov., 1902; 7 B. O. H. fur. (20-ton). Adding one 6-ton Heroult electric steel fur. Fuel, nat. and prod. gas and fuel oil.

Product: car couplers, car yokes, car bolsters, truck frames, and general railroad castings for sale. Annual cap., 76,000 tons.

BUCYRUS CO., South Milwaukee, Wis.

Inc. Oct. 31, 1911. 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, V. P.; G. A. Morison, Sc.; D. P. Eells, T.; W. F. Russell, C.; P. Knoll, P. A.

Works at South Milwaukee: blt. 1892; 2 B. O. H. fur. (10-ton, 12-ton); 3 gas prod.; 2 annealing fur.; 2 cupolas. Fuel, prod. gas.

Also operates works at Evansville, Ind., for the manufacture of company products. Steel and iron castings are made only at South Milwaukee works.

Product: carbon and alloy steel castings for sale and for own use in the manufacture of dredges, steam shovels, railroad wrecking cranes, pile drivers, excavating machinery, etc. Annual cap., 7,500 tons of steel castings; 4,000 tons gray iron castings.

BUCYRUS STEEL CASTING CO. (The), Bucyrus, Ohio.

Merged with The Carroll Foundry and Machine Co. April 1, 1911; steel department operated under the name of the The Bucyrus Steel Casting Co.; gray iron foundry operated under the name of The Carroll Foundry and Machine Co. Org. 1906-7; inc. April 1, 1911. Capital stock: com., \$400,000.

F. P. Donnenwirth, P.; W. A. Blicke, V. P. & T.; C. Fred Vollmer, Sc. & P. A.

Western selling agent; M. H. Treadwell Co. of Illinois, Commercial National Bank Bldg., Chicago.

Works at Bucyrus: blt. 1906-7; 2 special B. O. H. fur. (20-ton); 5 heat. pits; first steel made Mar. 14, 1907. Fuel, oil. Machine shop for jobbing, special machinery construction, gear cutters, etc.

Product: Steel castings for sale for steam shovels, dredges, locomotive cranes, general machinery, railroad castings, etc. Annual cap., 15,000 tons. Also makes gray iron castings; annual cap., 6,000 tons.

Buffalo and Susquehanna Iron Co., see 1908 Directory, p. 239. Blast furnaces at Buffalo acquired by the Rogers-Brown Iron Co., April 22, 1910.

BUFFALO BOLT CO., Marine Bank Bldg., Buffalo, N. Y.

Org. 1897. Capital stock: com. auth., and issued, \$500,000; pref. 7% cum. auth. and issued, \$250,000. Bonds, \$250,000.

J. J. Albright, P.; R. C. Board, Sc. & T.; at Marine Bank Bldg., Buffalo. R. K. Albright, 1 V. P. & G. S. M.; Ralph Plumb, 2 V. P. & G. M.; W. B. Peirce, G. S.; at North Tonawanda, N. Y.

Sales offices: Chicago, 1531 Monadnock Bldg.; New York City, 122 Chambers St., Topping Bros. (agents); 21 State St., W. J. Kingsland (agent), export only.

Works at North Tonawanda, N. Y.: bolt and nut works blt. 1896; rolling mill added 1915 to be in operation about March 1, 1916; 2 5-d. heat. fur.; 2 bar mills (14" 3-h. 2-st., 10" 3-h. 5-st.). Fuel, producer gas. Electro gal. and bolt, nut and rivet plants. Machine shop for own use.

Product: 2,500 tons of iron and steel bars and flats for own use; 35,000 tons bolts, nuts, rivets, and screws.

Buffalo Crucible Casting Co., see 1908 Directory, p. 243. Company dissolved, plant dismantled in 1909.

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 and coke.

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. (The), 51 Hamburg St., Buffalo, N. Y.

Org. and inc. Nov. 2, 1900. Capital stock: com., \$1,000,000; pref. 7% cum. auth., \$200,000, issued, \$160,000.

Frank B. Baird, P.; Harry Yates, 1 V. P. & T.; C. A. Collins, 2 V. P.; R. F. Schelling, Sc.; H. T. McDougal, Cashier; B. Marron, G. M.; J. J. Sammon, G. S.

Selling agent: M. A. Hanna & Co., Cleveland.

Brand: "Buffalo."

Furnaces A, B, and C, Buffalo: 3 stacks: Furnace A, 78' x 18½', blt. 1892; f. o. Feb. 25, 1893; 1 2-pass Kennedy and 3 Cowper-Kennedy stoves; Furnace B, 82' x 19', blt. 1897-8; f. o. Aug. 12, 1899; rebld. 1914; 4 Hartman stoves (3 80' x 20' and 1 75' x 20'); Furnace C, 75' x 17½'; blt. 1899-1900; 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; 3 75' x 18' Mas-sicks & Crooke stoves; 12 steam blowing eng. (110,000 cfm.); 20 water-tube boilers, 5,600 H. P. Coke; Lake ore. 3 slag gran. pits, annual cap., 175,000 tons. Machine shop for own use.

Sintering plant, owned by the Sintered Ore Co., 45 Wall St., New York City, is located upon the property; daily cap., 150 tons.

Product: Bessemer, malleable, and foundry pig iron. Annual cap., 350,000 tons.

The Buffalo Union Furnace Co. owns a 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. It also owns the Belmont mine at Cordova Mines, Ontario, Canada. This mine though developed has not as yet shipped ore on a commercial basis. The

company also owns all the capital stock of the Canadian Furnace Co., Ltd., Port Colborne, Ont.

BUHL MALLEABLE CO., Wight & Adair Sts., Detroit, Mich.

Org. 1899; inc. Aug. 11, 1900. Capital stock: \$230,000.

A. H. Buhl, P.; W. E. Buhl, V. P.; S. A. Commons, Sc. & T.; P. J. McManus, G. M.; H. B. Strate, G. S.; F. J. Rademacher, P. A.

Works at Detroit: blt. 1899; first O. H. steel made May, 1913; 1 cupola (3-ton); 1 A. O. H. fur. (5-ton); 1 malleable steel fur. (5-ton) and 3 malleable melting fur. Fuel, Solvay coke, coal and oil. (Formerly owned and operated by the Western Malleable Steel Co.; acquired by present owners Aug. 1, 1909.)

Product: acid open hearth steel, malleable steel, and malleable iron castings for sale and own use; gray iron castings for own use only; specialty, castings for automobiles, motor trucks, pneumatic tools and railway and agricultural castings. Annual cap., 2,000 tons of open hearth steel castings, 1,000 tons of special malleable steel and 10,000 tons of malleable iron castings. Steel department especially equipped for small castings.

BUHL STAMPING CO., Detroit, Mich.

Capital stock: \$200,000.

W. E. Buhl, P.; A. H. Buhl, V. P.; L. D. Buhl, V. P.; J. M. Thurber, T.; D. M. Delemater, Sc.; T. A. Harris, G. M.

Works at Detroit, Mich.: blt. 1888; last rebt. 1908; first tinplates made 1888; 2 stacks for charcoal tinplates. Buys black plates. Galvanizing department. Fuel, coal and fuel oil.

Product: tinplates for own use in the manufacture of milk-can stock, milk cans, dairy pails, tubular lanterns, annual cap., 500 tons.

BURDEN IRON CO., Troy, N. Y.

Org. and inc. 1881. Capital stock: \$2,000,000.

James A. Burden, P.; Williams P. Burden, V. P.; Daniel W. Tallcott, M.; William E. Millhouse, A. M.; Robert Forrest, Sc. & T.; James D. Keith, M. S. Horse Shoe Dept.

Selling agents: Burden Sales Co., 30 Church St., New York.

Brands: "Burden," "H. B. & S.," and "Burden Best" for merchant bars.

Burden Furnace, Troy, N. Y.: 1 stack, blt. 1905-6, f. o. May 27, 1906, 80' x 17'; 1 Cowper-Roberts and 3 Gordon-Whitwell stoves; 2 steam blowing eng. (38,000 cfm.); 13 tubular boilers 1,625 H. P. Coke: N. Y. magnetic concentrates.—*Last active in 1907.* Product: forge pig iron, for own use and for sale, annual cap., 90,000 tons.

Burden Iron Works, Troy, N. Y.: est. 1813; 38 double puddling fur.; 15 heat. fur. (1 1-d., 10 2-d., 4 3-d.); 9 trains (four 20" 2-h. 3-st., one 14" 3-h. 5-st., four 9" 3-h. 4-st.) Fuel, bit. coal. Rivet factory and horseshoe works.

Product: merchant bars, staybolt iron, engine bolt iron, chain iron, iron boiler rivets $\frac{1}{2}$ " to $1\frac{1}{4}$ " diam., and horseshoes. Annual cap., 45,000 tons of bars, 150,000 kegs (100 lbs.) of rivets.

Burgess, Charles, see Cyclops Steel Works.

Burgess and Dickinson, Dunkirk, N. Y., were succeeded in 1908 by Atlas Steel Co., corporate title changed to Atlas Crucible Steel Co., July 2, 1912.

BURLINGTON STEEL CO. Ltd., Hamilton, Ont., Canada.

Org. and inc., 1910. (Formerly known as Canada Steel Co.; name changed to Burlington Steel Co., Mar. 10, 1914). Capital stock: com. \$250,000; pref. 7% cum. \$150,000.

F. W. Baillie, P.; R. M. Bertram, 2 V. P.; A. L. Malone, Sc.; at Toronto, Ontario. W. M. Currie, 1 V. P. & G. M.; C. M. Clinton. T. & P. A.; A. Oram, G. S.; H. V. Hamilton, G. S. M.; at Hamilton, Ontario.

Works at Hamilton, Ontario: blt. 1910, f. o. May 1, 1911; 1 4-d. coal-fired heat. fur., 1 cont. rail reheat. fur.; 1 forge fire; 12" 3-h. 7-st. mill; 8" mill with 12" 3-h. 2-st. roughing, 8" 3-h. 5-st. finishing; 5 ton crane and 5 shears. Fuel, coal. Machine shop for jobbing and own use.

Product: concrete bars, rounds, squares, angles and special shapes, annual cap., 25,000 tons.

*Burns Uniform Steel and Metallic Works, 1908 Directory, p. 312. Crucible steel forge acquired by Vanadium Alloys Steel Co., May 9, 1910.

BYERS CO. (A. M.), 235 Water St., Pittsburgh, Pa.

Org. 1864, inc. July 9, 1903. Capital stock: com. auth., \$1,200,000, issued, \$1,000,000; pref. 7% cum., \$800,000.

E. M. Byers, P.; J. F. Byers, V. P.; L. M. Johnston, Sc., T. & G. M.; Chas. Gross, S.; W. W. Williams, G. S. M.; J. E. Stauffer, P. A.

Sales offices: Boston, Mass., 11 Sleeper St.; Chicago, Ill., 720 Fulton St.; New York City, 23 Sullivan St.; also sales agents in the principal cities.

Product: muck bar, iron skelp, wrought iron pipe, casing, tubing, etc. Sizes of pipe made, $\frac{1}{8}$ " to 12" inclusive.

Works at Sixth St., South Side, Pittsburgh. Originally blt. 1862-3; 29 single puddling fur.; 3 3-d. natural gas heat. fur.; 2 trains (21" muck, 16" 2-h. 3-st. skelp). Fuel, coal and nat. gas. Machine shop for own use. Product; muck bar and iron skelp for own use; annual cap., 22,000 tons of muck bar and 30,000 tons of skelp. Pipe Mill Department contains 1 tong-weld, 1 butt-weld, and 2 lap-weld mills; fuel, producer gas; annual cap., 100,000 tons. One galvanizing pot, annual cap., 25,000 tons.

BYERS CO. (The A. M.) of Ohio, lessee, Girard, Ohio.

Org. and inc. 1906. Capital stock: \$50,000, all owned by heirs of A. M. Byers. Formerly Girard Iron Co., corporate title changed Jan. 6, 1916.

E. M. Byers, P.; J. F. Byers, V. P.; J. E. Stauffer, P. A.; at 235 Water St., Pittsburgh, Pa. S. K. Hine, Sc., T., & G. M.; at Girard, Ohio.

Sales office: Pittsburgh, Pa., 235 Water St.

Brand: "Girard" pig iron.

Product: foundry and forge pig iron for own use and for sale; muck bar and grooved skelp for affiliated use.

Mattie Furnace, Girard, Ohio: 1 stack, 82' x 19', blt. 1866; last rebt. in 1901; 3 Foote stoves, 70' x 20', 1 Massicks & Crooke stove, 90' x 20'; 3 steam blowing eng. (45,000 cfm.); 10 water-tube boilers, 3,466 H. P.; slag gran. pit, annual cap., 70,000 tons. Conn. coke; Lake ore. (Owned by heirs of A. M. Byers).

Product: foundry and forge pig iron, annual cap., 100,000 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.; 4 heat. fur. (4-d.); 4 trains (two 21" 3-h. muck, 3-h. Belgian skelp with 16" roughing and 12" finishing stands, 26" x 76" plate with 1 2-h. roughing and 1 3-h. finishing stand). Fuel, coal and prod. gas. (Owned by heirs of A. M. Byers).

Product: muck bar and grooved skelp, all consumed by the A. M. Byers Co. in the manufacture of wrought iron pipe. Annual cap., 53,000 tons muck bar and (including the plate mill) 56,000 tons of skelp. The plate mill, which is used to roll skelp, has an annual cap. of 30,000 tons of plates.

BY-PRODUCTS COKE CORPN., Syracuse, N. Y.

Inc. 1905. Capital stock: com. auth. \$10,000,000, issued \$5,235,200; bonds, \$3,245,000.

R. G. Hazard, P.; at Peace Dale, R. I. H. H. S. Handy, E. L. Pierce, V. P.; J. G. Hazard, Sc.; F. R. Hazard, T.; A. D. Allibone, A.; J. A. Whaling, P. A.; at Syracuse, N. Y. M. H. Sherman, G. M.; at 332 South Michigan Ave., Chicago, Ill.

Selling agents: Pickands, Brown & Co.

Brand: "Federal."

Federal Furnaces, 108th St. and Calumet River, South Chicago: 2 stacks. "A", blt. 1905-6, f. o. Feb. 1, 1907, 75' x 18' 6"; 4 2-pass central comb. stoves, 75' x 20'; "B", blt. 1907-9, f. o. Aug. 20, 1909, 80' x 20'; 4 Kennedy stoves, 80' x 20'; 1 double-strand casting machine. Coke; Lake ore. (Formerly operated by Federal Furnace Co.; acquired by present owners October 1, 1915.)

Product: malleable Bessemer, basic and foundry pig iron, annual cap., 250,000 tons.

California Industrial Co., Los Angeles: title changed April, 1914, to Southern California Iron and Steel Co.

CALUMET AND HECLA MINING CO., Calumet, Mich.

James MacNaughton, 2 V. P. & G. M.; John Knox, Jr., G. S.; Fred S. Eaton, Chief Clerk; E. D. Johnson, P. A.

Works at Calumet: blt. 1907; 3 single-pot crucible fur. Fuel, oil and coke. Machine shop for own use.

Product: steel, brass, bronze, and aluminum castings for the use of the company exclusively; also makes gray iron, chilled iron, and semi-steel castings.

CALUMET STEEL CO., Continental and Commercial Bank Bldg., Chicago, Ill.

Org. 1907; inc. Mar., 1907. Capital stock: \$325,000.

J. H. Porter, P.; A. S. Hook, V. P. & T.; S. S. Porter, Sc.; at 208 S. LaSalle St., Chicago. F. N. Prime, A.; L. H. Hook, G. S.; at Chicago Heights.

Works at Chicago Heights: blt. 1907-8; f. o. Feb. 28, 1908; 2 heat. fur. (one 4-d. and one cont.); 2 trains (14" 3-h. 7-st., 8" 3-h. 5-st.)

Fuel, coal and fuel oil. Machine shop for own use.

Product: Bessemer steel bars, angles, channels, tees, cultivator bars, and structural steel tubing. Annual cap., 50,000 tons.

CAMBRIA STEEL COMPANY, Morris Building, Philadelphia, Pa.

Org. Aug. 15, 1901; inc. Aug. 22, 1901. Capital stock: auth. \$50,000,000, issued \$45,000,000. Controlling interest acquired by Midvale Steel and Ordnance Co. in Feb., 1916.

A. C. Dinkey, P.; Alexander P. Robinson, V. P.; D. Brewer Gehly, Sc. & T.; P. B. Burtis, A. Sc.; L. K. Kruse, A. T.; C. B. McElhany, V. P. & G. M. S.; Howard W. McAteer, C.; at Philadelphia. Edwin E. Slick, V. P. & G. M.; at Johnstown, Pa.

Sales offices:

Atlanta, Atlanta National Bank Bldg.

Boston, Massachusetts Bldg., 60 State St.

Chicago, McCormick Bldg., Michigan Ave. & Van Buren St.

Cincinnati, Union Trust Bldg., Fourth & Walnut Sts.

Cleveland, Citizens Bldg., 190 Euclid Ave.

Detroit, Ford Bldg., Congress and Griswold Sts.

Johnstown, Cambria Bldg., Locust St.

Los Angeles, I. W. Hellman Bldg., Fourth and Main Sts.

Montreal, Canada, Leslie Bldg., 560 St. Paul St., A. C. Leslie & Co., Ltd.

Montreal, Canada, Coristine Bldg., 20 St. Nicholas St.,
 Alexander, Macpherson & Son (Railroad Sales Agents).
 New York, City Investing Bldg., 165 Broadway.
 Philadelphia, Morris Bldg., 1411-23 Chestnut St.
 Pittsburgh, Oliver Bldg., Smithfield St.
 St. Louis, Chemical Bldg., Eighth and Olive Sts.
 San Francisco, Wells Fargo Bldg.
 Tacoma, Fidelity Bldg., Eleventh and C Sts.

Product: forging ingots, blooms, billets and slabs; tin bars; steel T rails from 12 pounds to 125 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; girders, beams, columns, roof trusses and other fitted structural work including finished steel work for buildings and bridges; universal and sheared plates; angles, channels, beams, and other structural shapes; all kinds of steel and composite freight cars, car parts, and car and other steel forgings; tire, toe-calk, rounds, squares, hexagons, octagons, and many other special shapes, plain, concave, and baby carriage spring; Slick, deformed and twisted concrete bars; automobile rim, window sash, and other special sections; cold-drawn rounds, squares, flats, and special shapes; 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; finger bars, knife backs, rake teeth, spring harrow teeth, and other agricultural specialties; steel discs from 10" to 20" with rolled bevel for harrow, drills and cultivators; beveled discs 23" to 28" for plows; coulters 8" to 24" dia.; pressed steel seats for agricultural implements; wire rods; bright, galvanized and annealed wire; common, cement-coated, galvanized and blued nails; staples; bale ties, barbed wire; galvanized field and poultry fencing; and cop-peras.

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 4 rolling mill plants, etc., at Johnstown, Pa. The Cambria Iron Co. owns stock interests in the following companies:

Penn Iron Mining Co. of Michigan (100%).
 Penn Iron Mining Co. of Wisconsin (100%).
 Mahoning Ore and Steel Co. (50%).
 Johnstown Water Co. (51%).
 Manufacturers Water Co. (100%).

Juniata Limestone Co., Ltd. (62½%).

Cambria Inclined Plane Co. (100%).

The Cambria Steel Co. owns directly stock interest in the American Steel Export Co., (58½%), Cambria Steamship Co. (50%) and Mahoning Steamship Co. (50%).

BLAST FURNACES.

Cambria Plant, Johnstown, Pa.: Six stacks: No. 1 to No. 4 blt. 1853-4; No. 1, 91' x 21', last rebt. 1914; No. 2, 91' x 21', last rebt. 1901, remod. 1914; No. 3, 91' x 21', last rebt. 1914; No. 4, 91' x 21', last rebt. 1913; No. 5, 87' x 22', blt. 1873-6, last rebt. 1902, remod. 1914; No. 6, 87' x 22', blt. 1879, last rebt. 1903, remod. 1914; 29 two-pass side-combustion hot-blast stoves; 19 steam blowing eng. (300,000 cfm.); 58 tubular boilers, 19,100 H. P.; 3 Heyl & Patterson double-strand casting mach.; 125' rotary nodulizing kiln, 10' dia. for fine ore and flue dust, annual cap., 72,000 tons; 3 slag granulating pits, annual cap., 210,000 tons.

Franklin Plant, Johnstown, Pa.: Two stacks: No. 7, 85' x 22', blt. 1903-6, f. o. Jan. 17, 1906, and No. 8, 85' x 22', blt. 1906-7, f. o. Aug. 7, 1907; both remod. 1914. Eight two-pass center-combustion hot-blast stoves, 100' x 24'; 7 blowing eng. (6 steam, 1 gas); 100,000 cfm.; 20 tubular boilers, 6,000 H. P.; 2 Heyl & Patterson casting mach. Slag granulating pits, annual cap., 90,000 tons.

By-product and Conn. coke; Lake Superior hematite and native and foreign manganiferous ore.

Product: Bessemer, basic, foundry, and low-phosphorus pig iron, and spiegeleisen and ferro-manganese.

Total annual cap. of the 8 furnaces, 1,365,000 tons of Bessemer and basic pig iron.

ROLLING MILLS AND STEEL WORKS.

Cambria Plant, Johnstown: orig. blt. 1853. Bessemer Dept.: orig. blt. 1871, f. o. July 10, 1871; 4 Bessemer converters (12½-ton), annual cap., 700,000 tons of ingots.

Open Hearth Dept. (No. 1): orig. blt. 1878-9; 7 B. O. H. fur. (3 30-ton, 4 50-ton); 1 A. O. H. fur. (30-ton). Fuel, nat. gas. Annual cap., 228,000 tons basic and 12,000 tons acid ingots.

Rolling Mill Dept.: orig. blt. 1853; first iron rail rolled July 27, 1854; first steel rail rolled July 12, 1871; 7 ingot heat. fur.; 7 regenerative producer gas-fired heat. fur. (6 5-d., 1 6-d.); 3 cont. coal-fired regenerative heat. fur.; 8 coal-fired reverberatory heat. fur. (2 3-d., 6 4-d.); 9 trains (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, 22" cont. billet with 22" 2-h. 4-st. and 18" 2-h. 8-st., 9" 3-h. 7-st. bar, 22" 2-h. 1-st. axle rounds).

120
2100
7

Car Axle Dept.: annual cap., 40,000 tons. Steel foundry for general castings, alloy steel castings and rolls for own use only; annual cap., 5,000 tons. Machine shop for own use.

Franklin Plant, Johnstown: Open Hearth Dept. (No. 2): blt. 1900-01, f. o. April 30, 1901; 19 B. O. H. fur. (75-ton); 1 A. O. H. fur. (75-ton). Fuel, prod. gas. Annual cap., 810,000 tons basic, and 30,000 tons of acid ingots.

Rolling Mill Dept.: 16 soaking pits (cap. 256 ingots); 3 trains (40" 2-h. 1-st. blooming, 34" 2-h. 2-st. universal slabbing, 134" sheared plate mill); 6 3-d. regenerative producer-gas slab reheating fur.; 8 ham. (200- to 1,100-lb.). Fuel, coal and blast furnace gas for power.

Bolt, Nut and Rivet Dept.: annual cap., 15,000 tons. Make bolts $\frac{3}{8}$ " to 3", nuts $\frac{3}{8}$ " to $2\frac{1}{4}$ ", rivets $\frac{3}{8}$ " to $1\frac{1}{4}$ ", also pipe bands, brake pins and coupling pins.

Steel Carbuilding Dept.: annual cap., 15,000 cars; 3 hydraulic presses (550, 1,000, 2,100-ton).

Gautier Plant: orig. blt. 1878; 15 cont. heat. fur.; 13 trains (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, also 36" universal plate mill and 22" sheared plate mill); 11 steam drop hammers (600- 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 and drill discs and pressed steel seats.

Wire Mills, Johnstown: blt. 1910-11, first rods made Feb. 15, 1911; first wire, Apr. 15, nails, May 15, 1911; 1 cont. heat. fur. with 3 gas prod.; Morgan cont. double-strand rod mill with 12" 2-h. 6-st. cont. roughing and 10" 2-h. 10-st. cont. finishing; 196 wire drawing blocks, $\frac{1}{2}$ " to 30 gauge; 2 galvanizing fur.; 30 barbed wire mach.; 10 cut-stay fence mach.; 115 wire nail mach. Product and annual cap.: wire rods (120,000 tons); wire (95,000 tons); galvanized wire (40,000 tons); barbed wire (12,700 tons); wire fence (30,000 tons); wire nails (900,000 kegs). Copperas, 2,400 tons.

Total annual cap. of the four rolling mills and steel works: 700,000 gross tons of Bessemer steel ingots; 1,080,000 gross tons of open hearth steel ingots; 300,000 gross tons of steel rails; 1,100,000 gross tons of structural shapes, universal and other plates, bars, and wire products.

COKE OVENS, IRON-ORE MINES, ETC.

Cambria Steel Company operates extensive coal mines in Cambria county; also 420 Otto-Hoffmann by-product coke ovens at Franklin. 50 new ovens (included in the above) built in 1914 became productive, Jan. 22, 1915, and the entire coke plant has been or is being rebuilt and the oven capacity enlarged. Benzol plant (Edison system) blt. 1914-15, annual cap., 2,000,000 gals.

Cambria Steel Co. also controls the Penn Iron Mining Co., operating iron ore mines in the Menominee Range in Michigan; and the Mahoning Ore and Steel Co., which operates the Mahoning mine in the Mesabi Range in Minnesota.

Cambria Steel Company owns one-half of the stock of the Cambria Steamship Co. operating two vessels of 11,000 tons capacity each, one-half the stock of the Mahoning Steamship Co., operating 3 vessels of 9,500 tons capacity each, and owns the Steamship Republic of 4,500 tons capacity.

Cambria Steel Company also controls the Juniata Limestone Company, Limited, which operates limestone quarries at Carlisle, Blair County, Pa., and owns and operates the Nagney limestone quarries in Mifflin County, Pa.

CAMBRIDGE CO., Riverside, N. J.

Works at Riverside: 8" train with heat. fur. blt. 1911; f. o. Jan., 1912, rebt. Jan., 1914.

Product: iron bars for affiliated use, annual cap., 2,400 tons.

Canada Bolt and Nut Co., see Steel Co. of Canada.

Canada Iron Corporation, Ltd., The, acquired in Dec. 1908, the plants and properties of the Canadian Iron and Foundry Co., Ltd., the Canada Iron Furnace Co., Ltd., John McDougall & Co., and the Annapolis Iron Co., Ltd. The Canadian Iron and Foundry Co. owned gray iron foundries at Londonderry, Nova Scotia; Hamilton, St. Thomas and Fort William, Ontario; and Montreal and Three Rivers, Quebec. The Canada Iron Furnace Co. owned a blast furnace plant at Midland, Ontario, consisting of one coke stack and a gray iron foundry; and a charcoal furnace at Radnor Forges, Quebec. John McDougall & Co. owned 2 charcoal furnaces at Drummondville, Quebec. The Annapolis Iron Co. owned large deposits of iron ore at Torbrook, Nova Scotia. The Corporation was placed in the hands of liquidators, August 21, 1913, and the properties taken over on Oct. 1, 1915, by the Canada Iron Foundries, Ltd.

CANADA IRON FOUNDRIES, Ltd., Mark Fisher Bldg., Montreal, P. Q., Canada.

Inc. Mar., 1915, as a reorganization of The Canada Iron Corp., Ltd. Capital stock: com. auth. \$2,000,000, issued \$1,800,000; pref. 6% non cum. auth. \$2,500,000, issued \$2,200,000; debentures, auth. \$5,000,000, issued \$3,700,000.

Edgar McDougall, P. & G. M.; V. J. Hughes, V. P.; Andrew Whyte, Sc. & T.

Properties comprise: iron foundries at Three Rivers, Quebec; Fort William, St. Thomas, and Hamilton, Ontario; and Londonderry, Nova Scotia; (total annual cap., 150,000 tons cast iron

pipe, wheels, brake shoes and general castings): blast furnaces at Midland, Ont.; Radnor Forges, and Drummondville, Quebec: iron mines at Annapolis, Nova Scotia and Bathurst, New Brunswick.

Midland Furnaces, Midland, Ont.: 2 stacks, No. 1, 64' x 13', blt. 1900; f. o. Dec. 4, 1900; 3 2-pass Cowper-Whitwell stoves, 55' x 18'; No. 2, 75' x 17'9", blt. 1909-10; f. o. Aug. 25, 1910; 1 Roberts and 3 McKee stoves, 90' x 20'; 4 steam blowing eng. and 2 turbo blowers (61,000 cfm.); 6 water-tube and 6 tubular boilers, 5,400 H. P. Conn. coke; Michipicoten and imported Lake ore. Machine shop for jobbing and own use. (Formerly owned and operated by Canada Iron Furnace Co., Ltd.)

Product: foundry, malleable and Bessemer pig iron, annual cap., 125,000 tons. *Last active in 1913.*

Grantham and St. Francis Furnaces, Drummondville, Quebec; 2 stacks: Grantham Furnace, 35' x 10', blt. and f. o. 1880; rebt. 1907; St. Francis Furnace, 32' x 9', blt. and f. o. 1881; *abandoned*. (Formerly owned and operated by John McDougall & Co.)

Radnor Forges Furnace, Radnor Forges, Quebec: 1 stack, 46' x 9½', blt. and f. o. 1891; *abandoned*. (Formerly owned and operated by Canada Iron Furnace Co., Ltd.)

The company owns the Bathurst iron ore mines at Bathurst, Gloucester County, New Brunswick, and the Annapolis iron ore mine at Torbrook, Annapolis County, Nova Scotia. These mines are not now operated. Estimated ore reserves, 24,000,000 tons. Shipping points, Port Wade, N. S., and Newcastle, N. B.

The company also owns a limestone quarry at Longford Mills, Ontario, annual cap., 100,000 tons.

Canada Iron Furnace Co., Ltd., see Canadian Supplement, pp. 8, 12, merged in Canada Iron Corpn. in Dec., 1908. Blast furnace at Radnor Forges abandoned.

Canada Tin Plate and Sheet Steel Co., Ltd., see Canadian Supplement, pp. 14, 17, built a rolling mill and tinplate works at Morrisburg, Ont., in 1906-07. The manufacture of tinplate continued until Dec., 1908. In 1909 the Canadian Sheet Steel Corpn., Ltd., purchased the assets and rights of the Canada Tin Plate and Sheet Steel Co. and converted the plant to the manufacture of black and galvanized sheets. Operation was suspended in 1911 and not resumed. The works are operated on yearly lease by the Canada Steel Package Co., which has installed its own machinery. The sheet mill machinery and tin sets are in the works but not operated and are for sale or lease, see under J. Wesley Allison.

CANADIAN BRAKESHOE CO., Ltd., Sherbrooke, P. Q., Canada.

Org. and inc. Oct., 1911. Capital stock: com. auth. \$200,000, issued \$187,000; bonds \$43,500.

P. McCullough, P.; J. E. Davey, V. P.; E. W. Jones, Sec. & T.

Selling agents: Montreal, Taylor & Arnold, Ltd.; Vancouver, British Columbia Equipment Co.

Works at Sherbrooke: blt. 1912-13; f. o. Nov., 1913; 4 electric steel fur. (3 5,000-lb. and 1 2,000 to 2,500-lb.). May install a 2-ton Snyder electric steel fur. Fuel, electricity. Machine shop for own use. Gray iron and brass foundry.

Product: steel castings for sale and own use; also manganese steel castings; annual cap., 6,000 tons.

CANADIAN CAR AND FOUNDRY CO., Ltd., Transportation Bldg., Montreal, P. Q., Canada.

Inc. Nov. 1, 1909. Capital stock: com. auth. \$5,000,000, issued, \$3,875,000; pref. 7% cum. auth. \$7,500,000, issued, \$6,100,000 James Redmond, Ch.; Hon. Nathaniel Curry, P.; W. W. Butler, V. P.; V. G. Curry, V. P.; F. A. Skelton, Sc. & T.; E. L. Ludwig, A.; W. S. Atwood, C. E. & G. W. M.; J. A. Isherwood, P. A.

Product: steel, steel-underframe, and wooden freight and passenger cars of all types.

The Canadian Car and 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 carbuilding plants:

Amherst Works, Amherst, N. S. (formerly Rhodes, Curry & Co.)

Dominion Works, Dominion, near Montreal, P. Q. (formerly Dominion Car & Foundry Co.)

Turcot Works, near Montreal, P. Q. (formerly Canada Car Co., Ltd.)

Amherst Works at Amherst, N. S.: orig. blt. 1893. Rolling mill dept.: blt. 1906-07, first rolled products April 18, 1907; 2 busheling fur.; 2 coal-fired scrap fur.; 2 coal-fired heating fur.; 3 merchant mills (18" 3-h. 3-st.; 16" with 2 3-h., 1 2-h. st.; 9" with 2 3-h., 2 2-h. st.); 1 forge fire; 1 hammer (5-ton); 2 nut machines, 1 oil fur. for nut machines. Gray iron and car wheel foundries, machine shop, planing mill and car building shops.

Product: rounds, flats, angles and other sections, forged steel axles, car forgings and nuts. Annual cap., 30,000 tons of rolled material, 12,000 tons forgings, 600 tons of nuts, 6,500 tons gray iron castings, 10,000 tons cast iron car wheels.

CANADIAN FURNACE CO., Ltd., 51 Hamburg St., Buffalo, N. Y.
Org. and inc. Mar. 21, 1912. Capital stock: \$500,000; bonds \$400,000. Entire capital stock is owned by the Buffalo Union Furnace Co.

Frank B. Baird, P.; Harry Yates, 1 V. P. & T.; C. A. Collins, 2 V. P.; R. F. Schelling, Sc.; B. Marron, G. M.; J. J. Sammon, G. S.

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

Brand: "Victoria."

Victoria Furnace, Port Colborne, Ont.: 1 stack, 82' 6" x 19' 6", construction commenced July, 1912; completed and f. o. Sept. 27, 1913; 3 2-pass stoves, 85' x 20'; 2 steam blowing eng. (40,000 cfm.); 8 water-tube boilers, 2,400 H. P. Conn. coke; imported Lake ore. Slag gran. pit with annual cap. 60,000 tons slag sand. Machine shop for own use.

Company owns small magnetite iron ore mine, not yet operated commercially at Cordova Mines, Ont.

Product: foundry, malleable, and Bessemer pig iron, annual cap., 125,000 tons.

CANADIAN HORSE SHOE CO., Ltd., Hamilton, Ont.

Org. and inc. March, 1915. Capital stock: \$300,000.

Works at Hamilton, Ont.: construction begun May 1, 1915; equipment will consist of a mill for rolling horseshoe bars and the necessary machinery for converting these bars into horseshoes; plant to be completed about April 1, 1916.

Canadian Sheet Steel Corp., Ltd., see Canada Tin Plate and Sheet Steel Co., Ltd.

CANADIAN STEEL FOUNDRIES, Ltd., Transportation Bldg., Montreal, P. Q., Canada.

Org. and inc. Jan. 1, 1911. Capital stock (all owned by the Canadian Car and Foundry Co.): com. \$3,000,000; pref. 7% cum. auth. \$2,000,000; issued \$1,400,000; bonds \$3,486,040.01.

Hon. Nathaniel Curry, P.; W. F. Angus, V. P. & M. D.; K. W. Blackwell and W. W. Butler, V. P.; F. A. Skelton, Sec. & T.; E. L. Ludwig, A.; F. E. Smith, S. M.; J. A. Isherwood, P. A.

Sales offices: Toronto, Ontario, 16 Dineen Bldg.; Winnipeg, Manitoba, 903 Electric Chambers.

Brand: "C. S. F." in circle.

Product: steel castings, springs, switches and track work, bar iron, structural shapes, light rails.

Welland Plant, Welland, Ont.: blt. 1906-7; 2 stationary B. O. H. fur. (20-ton, 25-ton); first O. H. steel made Aug. 15, 1907; 2 2-d. heat. fur., 1 cont. heat. fur.; 2 trains (22" 3-h. 4-st., 12" 3-h. 5-st.); first products rolled, June, 1908. Fuel, nat. gas, oil and bit. coal. Electric power from Niagara Falls. Machine shop for jobbing and own use. (Formerly owned and operated by Ontario Iron and Steel Co.; acquired by Canadian Steel Foundries, Ltd., Jan. 1, 1911.)

Product: steel ingots, billets, squares, rounds, flats, angles, channels, fish plates, and 12 to 25-lb. rails; steel castings for sale and for own use for cars, locomotives and machinery. Annual cap., 32,000 steel ingots, 10,000 tons steel castings, 30,000 tons billets, 28,000 tons finished rolled products.

Point St. Charles Works, Point St. Charles, Montreal: blt. 1883; 3,000-lb. modified acid Bessemer converter added and first steel

made 1897 (abandoned); 2 A. O. H. fur. (15-ton). Fuel, coal and coke. Machine shop for jobbing and own use. (Formerly owned by Montreal Steel Works, Ltd.; acquired by Canadian Steel Foundries, Ltd., Jan. 1, 1911.)

Product: steel castings for sale and for own use for cars, locomotives, machinery, etc.; manganese steel castings; springs, switches and track work for steam and electric roads; gray iron castings. Annual cap., 12,000 tons O. H. and manganese steel castings, 3,000 tons gray iron castings.

Longue Point Works, Longue Point, Montreal: blt. 1910-12; f. o. July 4, 1912; 3 A. O. H. fur. (30-ton). Fuel, oil. Machine shop for jobbing and own use.

Product: steel castings for sale and for own use for cars, locomotives, machinery, etc.; manganese and vanadium alloy steel castings; annual cap., 18,000 tons.

CANONSBURG STEEL AND IRON WORKS, Canonsburg, Pa.

Org. and inc. Sept. 2, 1902. Capital stock: auth. \$250,000, issued \$201,900.

John M. Watson, V. P.; George D. McNutt, T.; George W. Retberg, Sc.

Works at Canonsburg: blt. 1882; 6 pair and sheet fur.; 12" 3-h. 1-st. bar, 6 black sheet mills (1 26" x 44", 1 26" x 36", 2 26" x 30", 2 25" x 30"); 6 single-stand cold mills; 7 nat. gas box annealing fur.; 1 Mesta 3-arm pickling machine. Fuel, nat. gas.

Product: steel and iron sheets for stamping, enameling, deep drawing, tinning, galvanizing, japanning, and stove and range work, etc.; annual cap., 26,000 tons.

Canton Iron and Steel Co., see 1908 Directory, p. 323. Works at Canton, Md. consisting of an iron rolling mill, acquired by Iron and Steel Products Co., June 9, 1909; acquired by The Canton Iron and Steel Works, Inc., at receiver's sale, Aug. 17, 1910. Destroyed by fire, April 22, 1913, and dismantled.

CANTON SHEET STEEL CO. (The), Canton, Ohio.

Inc., May 2, 1910. Capital stock: com. auth. \$1,000,000, issued \$300,000; pref. 7% cum., auth. \$1,000,000, issued \$200,000.

W. W. Irwin, P., G. S. & P. A.; H. S. Renkert, V. P.; C. A. Irwin, Sc., T. & G. M.; Frank Howell, A.; George T. Thomas, G. S. M. Selling agent in Philadelphia and New York: W. H. S. Bateman, 30 Church St., New York.

Works at Canton, Ohio: blt. 1910, f. o. Jan. 2, 1911; 7 black sheet mills, 28" x 36" (plan to install 8 additional black sheet mills, 28" x 36"); 7 pair and 7 sheet and 1 comb. heat. fur.; 4 24" cold mills; 7 box annealing fur.; 4 plunger pickling mach.; 8 galv. pots. Fuel, coal, coke, and nat. gas.

Product: black and galvanized sheets, annual cap., 40,000 tons, to be increased to 90,000 tons.

CANTON STEEL FOUNDRY CO. (The), Graham & Allen Sts., Canton, Ohio.

Org. and inc. Jan. 1, 1912. (Formerly the Shull Steel Castings and Manufacturing Co.; corporate title changed to The Canton Steel Foundry Co., Jan. 1, 1912). Capital stock: com. auth., \$200,000, issued, \$156,900; pref. 7% cum., auth. \$150,000, issued, \$146,900.

Willard Pennock, P.; at Minerva, Ohio. Frank J. Bordner, V. P.; Roy D. Snively, Sc.; E. G. Van Horn, T.; S. M. Swarts, G. M. & G. S.; at Canton.

Works at Canton; blt. 1907; 2 A. O. H. fur. (20-ton, 40-ton). Fuel, oil, nat. and prod. gas.

Product: steel castings for sale, annual cap., 14,000 tons.

CARBON IRON AND STEEL CO., Ltd., Mauch Chunk, Pa.

Org. Feb., 1892; inc. as limited partnership Feb., 1892. Capital stock: com. \$250,000; bonds, \$150,000.

M. S. Kemmerer, Chairman; J. L. Kemmerer, Sc. & T.; at Mauch Chunk. S. S. Freeman, G. M.; at Parryville.

Brands: "Carbon" foundry; "Parry" Bessemer; "Viking" low-phosphorus.

Carbon Iron Works. Furnace at Parryville, Pa.: 1 stack; 66' x 15', blt. 1869; last rebt. 1898; 3 Foote stoves, 65' x 18'. Anthracite coal and coke; N. J. and Lake Champlain magnetic, Lake and foreign ores.

Product: Bessemer, low-phosphorus, and foundry pig iron; annual cap., 40,000 tons.

CARBON STEEL CO., Foot of 32nd St., Pittsburgh, Pa.

Inc. 1894. Capital stock: com. \$3,000,000; pref. \$2,000,000; bonds \$700,000.

Charles McKnight, P.; D. R. Wilson, A. P. & T.; G. S. Macrum, V. P.; W. W. Noble, Sc. & A. T.; C. E. Middleton, G. S.; C. F. Blue, Jr., G. S. A.; P. Welker, P. A.

Sales offices:

Chicago, Railway Exchange Bldg., F. T. Connor and T. A. Goodridge (agents).

Cleveland, Williamson Bldg., E. W. Saunders, (agent).

Detroit, Ford Bldg., H. S. Finkenstaedt, (agent).

New York, Cameron Bldg., L. R. Wells, (agent).

Washington, Woodward Bldg., Faust & Wilson, (agents).

Brands: "Decco," "Shrapo," "Arbo," "Cromo," "Nico," "Weto," "Carnova," "Carbonet," "Crovano," "Peerless," and "Carbon Firebox."

Works at Pittsburgh: blt. 1862; rebt. 1888; 21 soaking pits; 3 B. O. H. fur. (40 to 50-ton); 3 A. O. H. fur. (40 to 50-ton); small Wile and 6-ton Heroult electric fur. building; 36" universal mill,

128" plate mill, 3 bar mills (1 10", 2 16"); 6000-lb. ham.; 500-ton steam hydraulic forging press; 2 Rockwell and one Tate-Jones muffled heat-treating and annealing fur. Fuel, nat. gas except under boilers.

Product: ingots, slabs, billets, universal and sheared plates, 5-ply safe plates, special treatment protective deck and bullet proof plates, locomotive axles, pins and rods, special analysis and high-grade alloy and carbon bars. Annual cap., 150,000 tons of ingots, 100,000 tons of plates, billets, forgings and bars.

CARBORUNDUM CO. (The), Niagara Falls, N. Y.

Inc. Sept. 28, 1891. Capital stock: com., auth. and issued, \$2,500,000.

F. W. Haskell, P.; G. R. Rayner, Sc. & G. S. M.; F. H. Manley, T.; F. J. Tone, W. M.; S. S. Diemer, P. A.; at Niagara Falls. R. B. Mellon, V. P.; at Pittsburgh.

Branch offices:

Boston, 197-203 Congress St.	Milwaukee, 135 Sycamore St.
Chicago, 558 Washington Blvd.	New York, 26 W. Broadway.
Cincinnati, 308-310 Main St.	Philadelphia, 826 Arch St.
Cleveland, 1262 Ontario St.	Pittsburgh, 18 Wood St.
Grand Rapids, Mich., Market St.	

Works at Niagara Falls: blt. and f. o. 1895; 3 fur. for the manufacture by electricity of ferro-silicon and silicon carbide.

Product: 90 per cent. ferro-silicon and silicon carbide; annual cap., 2,000 tons.

CARNAHAN TIN PLATE AND SHEET CO. (The), Canton, Ohio.

Inc. May 2, 1901. Capital stock: com. auth., \$400,000, issued \$399,500; pref. 7% cum. auth. and issued \$100,000.

J. E. Carnahan, P.; Edward A. Langenbach, 1 V. P.; Roy Carnahan, Sc., T., & P. A.; J. F. Buchman, Jr., A.; J. H. Himes, G. M.; A. J. Maskrey, G. S.; W. K. Singleton, G. S. M.; at Canton. F. H. Snyder, 2 V. P.; at Massillon.

Sales agents:

Chicago, 333 S. Michigan Boulevard.
 Detroit, 555 W. Fort St.
 Kansas City, Mo., 114 W. 3rd St.
 Philadelphia, 537 The Bourse.
 St. Louis, 1100 Third National Bank Bldg.
 San Francisco, Wells-Fargo Bldg.

Works at Canton: blt. 1900-01, f. o. 1902; 6 tin mills, 1 black sheet mill (4 28" x 32", 3 28" x 38"); 7 pair and 7 sheet fur.; 2 Mesta pickling mach.; 7 box annealing fur. (prod. gas); 9 cold mills (3 single stand, 3 sets of 2 tandem). Forge blt. 1905; 6 charcoal knobbling fires; 1 hammer (5,000-lb.); use iron and steel shear-ings and pig iron; 1 pile heat. fur.; 1 3-d. reheat. fur.; 26" 2-h.

1-st. bar mill. Tin house: blt. 1901; first tinplates made Dec., 1901; 14 sets (10 for terne, 3 for coke, 1 for charcoal).

Product: terne plates, coke and charcoal tinplates, enameling stock, polished sheets, blued and black sheets. Annual cap., 30,000 tons black plates for tinning and black sheets; 375,000 base boxes terne plates, 150,000 base boxes coke and charcoal tinplates.

CARNEGIE STEEL COMPANY (OF NEW JERSEY), Carnegie Bldg., Pittsburgh, Pa.

Inc. 1903. Subsidiary of the United States Steel Corporation.

James H. Reed, Ch.; Homer D. Williams, P.; H. P. Bope, 1 V. P. & G. M. S.; W. W. Blackburn, 2 V. P. & Sc.; William Whigham, 3 V. P.; John McLeod, A. P.; W. R. Balsinger, A. P.; W. C. McCausland, T.; J. J. Campbell, A. & A. Sc.; J. M. Taylor, P. A.; L. C. Bihler, T. M.

Sales offices:

Birmingham,	Cleveland,	Philadelphia,
Boston,	Denver,	Pittsburgh,
Buffalo,	Detroit,	St. Louis,
Chicago,	New Orleans,	St. Paul.
Cincinnati,	New York,	

Pacific Coast Representatives: United States Steel Products Co., at Los Angeles, Portland, San Francisco and Seattle.

Export Representatives: United States Steel Products Co., at Hudson Terminal Bldg., 30 Church St., New York.

Product: pig iron, spiegeleisen, ferro-manganese, ferro-silicon; Bessemer and open hearth 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, zees; 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, brass, and steel castings, ingot molds and stools for own use.

Bellaire Works, Bellaire, Ohio: Blast furnaces: 2 stacks; No. 1, blt. 1873, rebld. 1886, 76' x 19'; No. 2, blt. 1894-95, 75' x 19'; 8 Massicks and Crooke stoves, 56' x 18'; 6 steam blowing eng.; 1 double-strand Uehling casting machine. Conn. coke; Lake ore. Product: Bessemer pig iron., annual cap., 276,000 tons.

Steel Works: blt. 1883-84, rebld. 1897; 2 Bessemer converters (10-ton); f. o. April 28, 1884; 3 cupolas; 1 metal mixer (250-ton);

4 soaking pits. Rolling mill: blt. 1867, rebt. 1895; 3 trains (32" 2-h. 1-st. reversing blooming, 24" 3-h. 2-st. and 24" 2-h. 1-st.) Fuel, coal, nat. and prod. gas. Foundry, annual cap., 1,550 tons of iron and brass castings for own use. Machine shop for own use. Product: soft steel blooms, billets, slabs, and sheet and tinplate bars. Annual capacity, 420,000 tons ingots; 364,000 tons rolled products.

Carrie Furnaces, Rankin, Pa.: 7 stacks.

No.	Built	Blown in	Last Rebuilt.	Present Size	Stoves No.	Size
1	1883	Feb. 29, 1884	1901	87'6 1/4" x 21'6"	4	90'x21'
2	1888-89	July 19, 1889	1901-02	87'6 1/4" x 21'6"	4	90'x21'
3	1899-01	Feb. 25, 1901	.....	98'x 22'	4	100'x21'
4	1899-01	Apr. 24, 1901	.....	98'x 22'	4	100'x21'
5	1902-03	Apr. 10, 1903	.....	85'3" x 21'6"	4	90'x21'
6	1906-07	June 4, 1907	.....	95'x 21'6"	4	90'x21'
7	1906-07	Aug. 3, 1907	.....	95'x 21'6"	4	90'x21'

The furnaces are equipped with 3-pass Massicks and Crooke stoves; 19 blowing eng. (15 steam, 4 gas). Electric power capacity 4,400 K. W. per hour by steam and 12,000 K. W. per hour by gas equipment. Two slag granulating pits. Conn. coke; Lake ore. Four double-strand Heyl & Patterson casting machines. Molten metal shipped direct to Homestead Steel Works. Machine shop for own use. Product: basic pig iron, annual cap., 1,101,000 tons.

Clairton Works, Clairton, Pa. (leased).

Blast furnaces: 3 stacks, blt. 1901-03, each 85' x 21'. No. 1 blown in April 21, 1903; No. 2, June 14, 1903; No. 3, Dec. 8, 1904; 12 Massicks and Crooke stoves, 95' x 21'; 7 steam blowing eng.: 1 Heyl & Patterson double-strand casting machine. Conn. coke; Lake ore. Product: basic pig iron, annual cap., 459,000 tons. Plan to install by-product coke plant, annual cap., 1,000,000 net tons, type of oven not yet determined; to be completed about July 1, 1917.

Steel works and rolling mill: blt. 1901-02; 13 B. O. H. fur. (60-ton); first basic steel made Sept. 11, 1902; 1 A. O. H. fur. (60-ton) first acid steel made Sept. 8, 1902; 6 4-hole soaking pits; 10 heating fur.; 6 trains (40" 2-h. 1-st. reversing blooming, 28" 3-h. 1-st. billet; two 22" 3-h. 3-st. structural; 18" 3-h. 4-st. bar, 14" 3-h. 7-st. structural). First bars rolled July 27, 1905; first structural shapes, Nov. 30, 1905. Fuel, nat. gas for O. H. and soaking pits; bit. coal for boilers. Machine shop for own use. (Owned and formerly operated by Clairton Steel Co.) Product: ingots, billets, blooms, slabs, structural shapes, and merchant bars; forging blooms and forging billets. Annual cap., 48,000 tons acid, 552,000 tons basic, ingots; 573,000 tons blooms, billets and slabs; 136,000 tons merchant bars, 284,000 tons structural shapes.

Clark Works, 35th St., Pittsburgh, Pa.

Blt. 1869; 7 heat. fur; 6 trains (20" bar with 1-st. 3-h. and 1-st. 2-h.; 12" hoop and band with 3-st. 3-h. and 1-st. 2-h.; 10" hoop and band with 5-st. 3-h. and 1-st. 2-h.; 9" hoop and band with 4-st. 3-h. and 1-st. 2-h.; 8" guide with 3-st. 3-h. and 3-st. 2-h.; 8" hoop and band with 4-st. 3-h. and 1-st. 2-h.). Fuel, natural gas and coal. Machine shop for own use. Product: hoop, band, box, and scroll steel, cotton ties, skelp, and rounds, squares, ovals and half ovals. Annual cap., 81,500 tons.

Columbus Works, Columbus, Ohio.

Blast furnaces: 2 stacks, No. 1, blt. 1873, last rebt. 1900, 75' x 18' 6", 3 Massicks and Crooke stoves, 65' x 18'; No. 2, blt. 1897, 80' x 18' 6", 3 Massicks and Crooke stoves, 75' x 19' 6"; 6 steam blowing eng. Conn. coke; Lake ore.

Product: Bessemer pig iron, annual cap., 181,000 tons.

Steel works and rolling mill: blt. 1894-95, f. o. May 2, 1895; 4 cupolas; 2 Bessemer converters (4½-ton); 2 soaking pits; 2 trains (32" 2-h. 1-st. blooming, 24" 3-h. 1-st. sheet bar). Fuel, coal, coke and nat. gas. Machine shop for own use.

Product: ingots, blooms, slabs, billets and sheet bars. Annual cap., 184,000 tons ingots; 156,000 tons of rolled products.

Duquesne Works, South Duquesne (P. O. address Duquesne), Pa.:

Blast furnaces; 6 stacks. No. 1, 100' x 22', f. o. June 8, 1896; No. 2, 100' x 23', f. o. Oct. 7, 1896; No. 3, 100' x 22', f. o. May 7, 1897; No. 4, 100' x 22', f. o. June 21, 1897; No. 5, 94' x 22', f. o. Mar. 16, 1909; No. 6, 94' x 23', f. o. Aug. 10, 1909; 16 Kennedy-Cowper stoves, 96' x 21' and 8 3-pass Massicks and Crooke stoves, 100' x 22'; 16 blowing eng. (12 steam, 4 gas); 4 double-strand Uehling casting machines; 3 slag granulating pits. Molten metal to O. H. dept. Product: basic pig iron, annual cap., 1,035,000 tons. Steel works and rolling mill: orig. blt. 1886-88. Bessemer converters, f. o. Feb., 1889, were dismantled in 1908. First steel rolled, March, 1889. First open hearth steel made Oct., 1900. Two open hearth plants: 32 B. O. H. fur. (12 75-ton, 6 60-ton, 14 50-ton); 3 mixers (100-ton, 300-ton, 300-ton); 64 gas prod.; 11 soaking pits; 8 heating fur.; 11 trains (40" 2-h. 1-st. blooming; 38" 2-h. 1-st. blooming; 22" reversing bar with 28" 2-h. 1-st. roughing and 22" 2-h. 1-st. finishing; 21" billet with 29" 3-h. 1-st. roughing, 21" 3-h. 6-st. finishing; 14" 2-h. 10-st. billet; 14" 2-h. 8-st. billet; 13" 2-h. 10-st. bar; two 10" 2-h. 10-st. bar; 10" 3-h. 6-st. guide; 8" 3-h. 6-st. guide); 2 reeling machines; 7 bar twisting machines; 8 cutting off mach.; 4 tapering mach. Fuel, bit. coal, natural and producer gas. Steel and gray iron foundry; 1,200 tons steel, 1,000 tons iron castings for own use. Machine shop for own use.

Product: ingots, blooms, billets, slabs, sheet bars, splice bar shapes, merchant bars, plain, twisted and tapered. Annual cap., 1,346,000 tons ingots; 1,119,000 tons blooms, slabs, billets, sheet bars, and splice bar shapes; 646,000 tons merchant bars.

Edgar Thomson Works, Bessemer (P. O. address Braddock), Pa.
Blast furnaces: 11 stacks.

Furnace.	Present size.	No.	Stoves.		First Blast.
			Size.		
A	91' x 22'	{ 1	75' x 18'		Jan. 15, 1880.
		{ 3	90' x 18'		
		{ 1	91' x 21'		
B	85' x 21'	{ 2	100' x 22'		April 2, 1880.
		{ 2	91' x 21'		
C	85' x 21'	4	91' x 21'		Nov. 6, 1880.
D	91' x 22'	4	90' x 21'		April 19, 1882.
E	91' x 22'	4	91' x 21'		June 22, 1882.
F	91' x 22'	4	90' x 21'		Oct. 17, 1886.
G	91' x 22'	{ 3	90' x 21'		June 20, 1887.
		{ 1	100' x 22'		
H	91' x 22'	5	91' x 21'		Feb. 27, 1890.
I	91' x 22'	3	100' x 22'		Aug. 14, 1890.
J	91' x 22'	4	98' x 21'		Feb. 16, 1903.
K	91' x 22'	4	98' x 21'		Dec. 5, 1902.

43 blowing eng. (41 steam, 2 gas); 7 Uehling casting machines; molten metal to metal mixers and iron foundry. Flue dust briquetting plant, annual cap., 108,000 tons. Conn. coke; Lake ore. Product: Bessemer and basic pig iron, annual cap., 1,860,000 tons.

Steel works and rolling mill: blt. 1873, first Bessemer steel made Aug. 26, 1875; first rolled steel, Sept. 1, 1875; 4 Bessemer converters (15-ton); 7 special cupolas; 4 mixers (150, 230, 230, and 500-ton); 14 B. O. H. fur. (90-ton); 7 soaking pits (21 holes) 4 cont. heat. fur.; 10 heat. fur.; 2 heat-treating fur.: 6 trains (48" 2-h. 2-st. blooming; 40" 3-h. 1-st. blooming; 28" rail with 28" 3-h. 2-st. and 28" 2-h. 1-st.; 24" 3-h. 3-st.; 32" rail with 32" 3-h. 3-st. and 32" 2-h. 1-st.; 19" rail with 19" 3-h. 3-st. and 19" 2-h. 1-st.); the 24" rail mill may be dismantled; equipment for finishing rails at low temperature, hot saws, and finishing machinery. Fuel, bit. coal, natural and producer gas. Connected with the works are iron and brass foundries; splice bar shop with 2 cont. heating fur., 2 heat treating fur. and finishing machinery, f. o. 1910; forge shop with 2 heat. fur. and 1 6-ton hammer for mill work. Machine shop for own use. Product: ingots, heavy and light rails, billets, sheet bars, splice bars, gray iron and brass castings. Annual cap. 1,010,000 tons Bessemer ingots, 840,000 tons basic open hearth ingots, 1,565,000 tons blooms and billets, 1,350,000 tons heavy rails, 160,000 tons light rails, 85,000 tons splice bars, 180,000 tons molds and stools, 13,300 tons iron castings, 1,600 tons brass castings, 75 tons babbitt metal.

Edith Furnace, North Side, Pittsburgh (formerly Allegheny), Pa.: 1 stack: blt. and f. o. 1898; 97' x 20'; 5 stoves (1 Massicks and Crooke, 85' x 21'; 2 McClure, 100' x 22'; 2 Kennedy, 65' x 18'); 2

5 steam blowing eng.: 1 slag granulating pit; 1 single-strand Heyl & Patterson casting machine. Conn. coke; Lake ore. Machine shop for own use. (Owned by American Steel & Wire Co., leased by Carnegie Steel Co., Nov. 1, 1908.)

Product: Bessemer pig iron, annual cap., 147,000 tons.

Farrell Works, Farrell, Pa. (Formerly South Sharon Works.)

Blast furnaces: 3 stacks. No. 1, blt. 1900-01, f. o. Dec. 8, 1901, 100' x 21'; No. 2, blt. 1902-04, f. o. Sept. 9, 1904, 79' x 19'; No. 3, blt. 1902-04, f. o. Nov. 27, 1904; 12 Cowper-Kennedy stoves (4 111' x 22' at No. 1; 8 90' x 22' at No. 2 and No. 3); 8 steam blowing eng.; 2 double-strand Heyl & Patterson casting machines. Molten metal to O. H. dept. Gray iron foundry (1,000 tons) for mill repairs. Machine shop own for use. By-product coke; Lake ore. Product: basic pig iron, annual cap., 406,000 tons.

Steel Works and rolling mill: blt. 1900-01; 12 B. O. H. fur. (50-ton) first steel made April 30, 1901; 1 mixer (250-ton); 4 4-hole soaking pits; 9 heat. fur.; 4 trains (36" 2-h. 1-st. reversing blooming; 18" 2-h. 6-st. bar; billet mill with 18" 2-h. 3-st. and 13" 2-h. 3-st.; 48" universal plate mill). Fuel, producer and by-product coke-oven gas, tar and coal. Machine shop for own use. (Owned by Union Steel Co.; operated by Carnegie Steel Co.) Product: ingots, blooms, billets, skelp, universal plates; forging billets. Annual cap., 480,000 tons ingots, 280,000 tons blooms, billets and sheet bars, 150,000 tons universal plates and skelp.

Greenville Works, Greenville, Pa.: blt. 1871, rebt. after fire 1906; 6 heat. fur.; 3 trains (8" guide with 3-st. 3-h. and 2-st. 2-h.; 10" guide with 2-st. 3-h. and 2-st. 2-h.; combination 10" to 8" with 5-st. 3-h. and 2-st. 2-h.). Fuel, coal. Machine shop for own use.

Product: steel bars and shapes, annual cap., 83,000 tons.

Homestead Works, Munhall, Pa.: blt. 1880-81; first Bessemer steel made Mar. 19, 1881; first steel rail Aug. 9, 1881; Bessemer converters blt. 1881, dismantled in July, 1912.

Open hearth dept.: first acid open hearth steel made Oct. 27, 1886, first basic open hearth steel, March 30, 1888; 65 B. O. H. fur. (15, 25, two 30, fifteen 35, four 40, twenty-eight 50, ten 60, and four 75-ton); molten metal from Carrie Furnaces; 3 mixers (200, 250-ton; 1,500-ton building); 26 soaking pits, 109 holes; 40 heating fur.; 17 trains (28" 2-h. 1-st. reversing blooming; 38" 2-h. 1-st. reversing blooming; 33" 3-h. blooming; 40" 2-h. 1-st. reversing cogging; 32" 2-h. 1-st. universal slabbing; 30" 2-h. 1-st. universal slabbing; 23" 3-h. 3-st. structural; 33" 3-h. 3-st. structural; 35" 3-h. 4-st. structural; 16" 3-h. 3-st. billet; 12" 3-h. 3-st. bar; 2 universal plate mills (42" and 48"); 4 3-h. sheared plate mills (72", 84", 128" and 140"). Bolt and rivet works: bolts $\frac{3}{8}$ " to 3"; rivets $\frac{3}{8}$ " to 1".

Beam fitting shop: steel foundry, carbon and alloy castings for own use, annual cap., 2,500 tons. Armor plate plant with 3 hydraulic

forging presses (12,000, 10,000 and 2,000-ton); 12 heat. fur.; carbonizing shop with 13 furnaces; special machine shop for finishing armor plate.

Steel wheel plant with 2 rolling mills for rolling wheels; 2 heat. fur.; 1 annealing fur. Fuel, coal, coke and natural gas.

Product: ingots, blooms, billets, slabs; structural shapes; structural work; boiler, ship, tank, bridge and universal plates; railroad ties; wheels and gear blanks; armor plate; forging blooms and forging billets. Annual cap., 2,441,000 tons basic ingots; 2,029,700 tons blooms, billets and slabs (of which 406,100 tons not rolled to finished forms at these works); 268,300 tons structural shapes; 6,000 tons fabricated structural work; 52,000 tons railroad ties; 6,000 tons piling; 24,000 tons rounds and squares; 338,000 tons universal plates, 563,000 tons sheared plates; 8,000 tons of wheels, gear blanks, etc.; 15,000 tons of armor plate.

Howard Axle Works, Homestead, Pa.: blt. 1899-00, f. o. April, 1900; 3 cont. heat. fur.; 3 heat treating fur.; 24" 2-h. 1-st. blooming mill; 12 steam hammers (7,000-lb.); 3 axle straightening presses, 32 axle cutting off and centering machines; 27 axle turning lathes, 1 axle boring machine. Fuel, coal.

Product: car and locomotives axles, annual cap., 180,000 tons.

Isabella Furnaces, Etna, Pa.: 3 stacks. No. 1, blt. 1872, rebt. 1902, 94' x 21'6"; 4 stoves, 90' x 21' (2 Kennedy, and 2 White & Kernan with Cowper-Kennedy checkers). No. 2, blt. 1872, last rebt. 1911, 4 stoves, 90' x 21'. No. 3, rebt. 1901-02, 94' x 21', 4 stoves, 90' x 21'; 10 steam blowing engines; 2 double-strand Uehling casting machines; 1 slag granulating pit. Gayley dry blast plant. Coke; Lake and foreign (manganese) ore.

Product: Bessemer, foundry, mill, basic, and low-phosphorus pig iron; ferro-manganese, ferro-silicon, and spiegeleisen. Annual cap., 294,000 tons Bessemer and basic, and 31,000 tons ferro-manganese or 441,000 tons Bessemer and basic.

Lucy Furnaces, Fifty-first St., Pittsburgh, Pa.: 2 stacks: No. 1, blt. 1872, last rebt. 1908, 87' x 21'; No. 2, blt. 1877, last rebt. 1898; 9 White & Kernan stoves with Cowper-Kennedy checkers (4 86' x 20', 5 86' x 21'); 7 steam blowing eng.; 1 double-strand Uehling casting machine; 1 slag granulating pit. Conn. coke; Lake and foreign (manganese) ore.

Product: Bessemer, basic, low-phosphorus, forge and foundry pig iron; spiegeleisen, ferro-manganese and ferro-silicon. Annual cap., 61,000 tons spiegeleisen, 41,000 tons ferro-manganese.

McCutcheon Works, 1281 Reedsdale St., North Side (formerly Allegheny), Pittsburgh, Pa.: blt. 1862; 7 heat. fur.; 6 trains (16" structural bar and band mill with 2-st. 3-h. and 1-st. 2-h.; 10" hoop and band with 3-st. 3-h. and 1-st. 2-h.; two 8" hoop and band with 4-st. 3-h. and 1-st. 2-h.; 8" 2-h. 9-st. cont.; 8" 2-h. 8-st. cont.) Fuel, coal. Machine shop for own use. Slack barrel hoop

factory. Product: hoops, bands, cotton ties, angles, skelp, bars, light rails (8, 10 and 12-lb.). Annual cap., 97,550 tons hoops, bands, etc.; and 30,000 tons slack barrel hoops.

Mingo Works, Mingo Junction, Ohio: Blast furnaces: 3 stacks (formerly 4). No. 1, blt. 1872, last rebt. 1900-01, abandoned Oct. 1911; will probably be dismantled and rebt. No. 2, blt. 1900-01, f. o. Sept. 24, 1901, 106'6" x 22'6", 4 Massicks and Crooke stoves, 85' x 19'6"; No. 3 blt. 1900-01, f. o. April 29, 1901, 4 Massicks and Crooke stoves, 85' x 21'; No. 4, blt. 1905-06, f. o. Jan. 20, 1906, 4 Massicks and Crooke stoves, 100' x 21'; 7 steam blowing eng.; 3 Heyl & Patterson casting machines; molten metal to mixer. Conn. coke; Lake ore. Product: Bessemer pig iron, annual cap., 532,000 tons.

Steel works and rolling mill: orig. blt. 1882 and 1885-86; first Bessemer steel Feb. 8, 1886; 2 Bessemer converters (10-ton); 3 cupolas; 1 mixer (250-ton); 4 4-hole soaking pits; 2 gas heat. fur.; 4 trains (36" 2-h. 1-st. reversing blooming; 32" 2-h. 1-st. reversing blooming; 18" continuous with 24" 2-h. 1-st. and 18" 2-h. 6-st.; 10" continuous bar and skelp with 4-st. 3-h. and 10-st. 2-h.). Fuel, bit. coal and producer gas. Machine shop for own use.

Product: ingots, blooms, billets, slabs, sheet and tinplate bars, merchant steel bars, and skelp. Annual cap., 600,000 tons ingots, 412,000 tons blooms, billets, slabs and sheet bars, 65,000 tons skelp or merchant bars.

Monessen Works, Monessen, Pa.: blt. 1898-99, f. o. Mar. 24, 1899; 2 cont. gas heat. fur.: 2 trains (combination mill with 20" 3-h. 1-st. breakdown and 10" 3-h. 4-st. and 10" 2-h. 1-st. strand and finishing; 8" hoop and band mill with 8" 3-h. 4-st. and 8" 2-h. 1-st.). Fuel, coal and nat. gas. Machine shop for own use.

Product: steel hoops, bands and cotton ties, annual cap., 57,000 tons.

Neville Furnace, Neville Island, Allegheny Co., Pa.: 1 stack, blt. 1900-01, f. o. July 3, 1901, 100' x 21'6"; 4 Kennedy 2-pass stoves, 100' x 22' and 2 White & Kernan with Cowper-Kennedy checkers, 100' x 22'; 3 steam blowing eng.; 1 Uehling single-strand casting machine. Conn. coke; Lake ore. (Owned by American Steel & Wire Co.; leased by Carnegie Steel Co., Nov. 1, 1908.) Product: basic pig iron, annual cap., 159,000 tons.

New Castle Works, New Castle, Pa.:

Blast furnaces, 4 stacks. No. 1, blt. 1872, last rebt. 1897; 5 Massicks and Crooke stoves (4 85' x 18'; 1 85' x 21'); No. 2 last rebt. 1903-04, 94'6" x 21', 4 Massicks and Crooke stoves (3 85' x 21'; 1 85' x 19'6"); No. 3, last rebt. 1903-04, 94'6" x 21', 4 Massicks and Crooke stoves, 85' x 21'; No. 4, blt. 1900-01, f. o. July, 1901, 106'6" x 21', 5 Cowper-Kennedy stoves (3 85' x 18', 1 91'9" x 90', 1 92' x 21'); 2 stoves 85' x 18' at No. 4 now being replaced by 2 Cowper-Kennedy stoves, 100' x 22'; 10 steam blowing eng.;

2 double-strand Heyl & Patterson casting machines; 4 slag granulating pits. Molten metal to mixer. Coke; Lake ore.

Product: Bessemer pig iron, annual cap., 603,000 tons.

Steel works and rolling mill: orig. blt. 1892, first Bessemer steel made Nov. 2, 1892; 2 Bessemer converters (12-ton); 2 mixers (225-ton and 1,000-ton); 5 4-hole soaking pits; 3 trains (36" 2-h. 1-st. reversing blooming; 2 cont. sheet and tin bar mills each with 28" 2-h. 2-st., 26" 2-h. 2-st., 24" 2-h. 5-st.). Fuel, coal and producer gas. Machine shop for own use. Product and annual cap.: 700,000 tons of ingots; 615,000 tons of sheet and tinplate bars.

Niles Furnace, Niles, Ohio: 1 stack, blt. 1870, last rebt. 1890; 76' 4" x 17'9"; 4 Massicks and Croke stoves (3 57' x 16'6"; 1 65' x 18'); 3 steam blowing eng.; 1 slag granulating pit. Conn. coke; Lake ore. Product: Bessemer pig iron, annual cap., 96,000 tons.

Ohio Works, Youngstown, Ohio.

Blast furnaces: 6 stacks.

No.	Built.	Blown in.	Present size.	Stoves	
				No.	Size.
1	1899-1900	Feb. 14, 1900	106' 6" x 23'	4	118' x 21'
2	1899-1900	June 7, 1900	106' 6" x 22'	4	118' x 21'
3	1900-01	Mar. 29, 1901	90' x 23'	4	118' x 21'
4	1903-04	Sept. 6, 1904	90' x 22'	4	118' x 21'
5	1907-09	June 29, 1909	95' x 23'	4	118' x 21'
6	1907-09	Feb. 11, 1909	95' x 23'	4	118' x 21'

No. 4 has Massicks and Croke stoves, the rest Cowper-Kennedy-Roberts stoves; 11 blowing eng. (7 steam, 4 gas); 3 double-strand Heyl & Patterson casting machines. Molten metal to mixers. Furnaces 5 and 6 are blown by gas engines using blast furnace gas. Conn. coke; Lake ore. Product: Bessemer and basic pig iron, annual cap., 1,052,000 tons.

Plan to install by-product coke plant, annual cap., 1,000,000 net tons, type of oven not yet decided; to be completed about July 1, 1917.

Steel works and rolling mill: blt. 1893-94; 2 Bessemer converters (10-ton); 12 B. O. H. fur. (65-ton); first Bessemer steel, Feb. 4, 1895; adding 3 B. O. H. fur. (50-ton), annual cap., 144,000 tons; 3 metal mixers (250-ton); 14 4-hole and 2 8-hole soaking pits; 6 trains (43" 3-h. 1-st. blooming; 40" 2-h. 1-st. reversing blooming; 23" 2-h. 5-st. roughing; 23" 2-h. 3-st. roughing; 23" 2-h. 3-st. finishing; 15" 2-h. 8-st. Morgan continuous); first steel rail rolled May 14, 1900. Fuel, coal and producer gas. Machine shop for own use.

Product: ingots, slabs, billets, rails, sheet and tinplate bars.

Annual cap. 696,000 tons Bessemer and 638,000 tons open hearth ingots, 600,000 tons rails and 312,000 tons blooms, billets and sheet bars; or 1,092,000 tons blooms, billets and sheet bars.

Painter Works, South Side, Pittsburgh, Pa.: blt. 1834: 7 regen. gas heat. fur.; 7 trains (16" combination with 2-st. 3-h. and 3-st. 2-h.; 10" hoop and band with 3-st. 3-h. and 1-st. 2-h.; 9" hoop and band with 4-st. 3-h. and 1-st. 2-h.; 3 8" hoop and band with 3-st. 3-h. and 1-st. 2-h.; 8" guide with 3-st. 3-h. and 1-st. 2-h.). Fuel, coal and producer gas. Machine shop for own use. All but 16" mill are electrically driven.

Product: hoops, bands, cotton ties, lock steel, stone saws, skelp and hinge steel, annual cap., 115,000 tons.

Schoen Steel Wheel Works, McKees Rocks, Pa.: blt. 1903, f. o., Nov. 1903; 14 heat. fur.; 2 special mills for rolling steel car wheels from slabs; 12 hydraulic forging presses (750 to 10,000-ton). Fuel, coal, nat. and prod. gas. Machine shop for own use.

Installing one additional wheel unit with furnaces, presses, etc., to be completed about Jan. 1, 1917; will increase capacity 50%.

(Formerly operated by Schoen Steel Wheel Co.; acquired by Carnegie Steel Co. of Pa. July 1, 1908. Operated by Carnegie Steel Co. of N. J.) Product: rolled and pressed steel car wheels, annual cap., 129,000 tons.

Sharon Works, Sharon, Pa.

Blast furnace: 1 stack, blt. 1866, rebt. 1883; 4 stoves (1 Cowper-Kennedy, 70' x 18'; 3 Whitwell, 60' x 18'); 4 steam blowing eng.; 1 slag granulating pit. Coke; Lake ore. Product: basic pig iron, annual cap., 95,000 tons.

Steel works and rolling mill: blt. 1896-7, f. o. May, 1897; 6 B. O. H. fur. (35-ton); 4 4-hole soaking pits; 2 heat. fur.; 2 trains (35" 2-h. 1-st. reversing blooming; 27" 3-h. 1-st. finishing with 22" bending mill and 24" bull-head). Fuel, coal, producer gas, tar and powdered coal. Machine shop for own use.

Product and annual cap.: 150,000 tons of ingots; 150,000 tons blooms; 142,000 tons sheet bars, or 120,000 tons angles, or 90,000 tons skelp.

Steubenville Furnace, Steubenville, Ohio: 1 stack: blt. 1872, rebt. 1886, remod. 1901; 3 Massicks and Crooke stoves, 65' x 18'; 3 steam blowing eng.; 1 slag granulating pit. Conn. coke; Lake ore. (Formerly owned by National Tube Co.: now owned by Carnegie Steel Co. of N. J.) Product: Bessemer pig iron, annual cap., 65,000 tons. *Last active in 1907.*

Upper and Lower Union Works, Pittsburgh, Pa.:

Upper Union Mills, 33rd st. and A. V. Ry., Pittsburgh, Pa.: blt. 1863-64; 21 heat. fur.; 7 trains (20" 3-h. 3-st. structural; 18" 3-h. 3-st. structural; 17" structural with 2-st. 3-h. and 1-st. 2-h.; 12" 3-h. 3-st. guide; 8" guide with 4-st. 3-h. and 1-st. 2-h.; 2 universal plate mills, 24" and 36"). Fuel, coal and nat. gas. Bolt and rivet works. Machine shop for own use.

Product: structural steel, bars, mine ties, splice bars, universal plates 6" to 36" wide, $\frac{1}{4}$ " and heavier, steel bolts $\frac{1}{2}$ " to 1" dia.

and 3" to 24" long, rivets $\frac{3}{8}$ " to 1" dia. and $1\frac{1}{2}$ " to 6" long. Annual cap., 156,475 tons structural steel and bars, 101,900 tons universal plates, 12,500 tons fitted structural work, 2,500 tons splice bars, 4,800 tons mine ties.

Lower Union Mills, 29th St. and A. V. Ry., Pittsburgh, Pa.: blt. 1861-62; 10 heat. fur.: 4 trains (15" 3-h. 3-st. bar with 1 2-h. bull-head; 12" guide with 3-st. 3-h. and 1-st. 2-h.; 9" guide with 3-st. 3-h. and 1-st. 2-h.; 72" sheared plate mill); 5 forge fires; 6 forge furnaces, 7 hammers (500 to 7,000-lb.) Fuel, natural gas and coal. Machine shop for own use and jobbing.

Product: sheared plates, checker plates, forgings and bar steel. Annual cap., 77,000 tons merchant bars, 50,000 tons sheared plates, and 2,000 tons forged products.

Upper and Lower Union Works, Youngstown, Ohio.:

Upper Union Mills, Youngstown, Ohio: blt. 1871, rebt. after fire 1877; 8 gas heat. fur.; 7 trains (10" to 7" semi-continuous with 8-st. 2-h. and 4-st. 3-h.; 10" to 8" semi-continuous with 8-st. 2-h. and 3-st. 3-h.; 8" guide with 3-st. 3-h. and 2-st. 2-h.; 10" semi-continuous hoop with 5-st. 2-h. and 2-st. 3-h.; 10" 2-h. 9-st. continuous; 12" guide with 3-st. 3-h. and 2-st. 2-h.; 10" cross country bar with 7-st. 2-h. and 1-st. 3-h.). Fuel, coal and producer gas. Machine shop for own use.

Product: merchant bars, hoops, bands, and tire steel, cotton ties, angles, channels, special shapes and skelp. Annual cap., 267,000 tons.

Lower Union Mills, Youngstown, Ohio: orig. blt. 1863; 6 heat. fur.; 5 trains (10" to 8" semi-continuous with 6-st. 2-h. and 3-st. 3-h.; 10" guide with 2-st. 3-h. and 2-st. 2-h.; 10" to 8" semi-continuous guide with 7-st. 2-h. and 3-st. 3-h.; 7" guide with 2-st. 2-h. and 3-st. 3-h.; 16" bar with 3-st. 3-h. and 1-st. 2-h.). Fuel, prod. gas and bit. coal. Machine shop for own use.

Product: steel merchant bars, channels and shapes, annual cap., 154,000 tons.

Zanesville Furnace, Zanesville, Ohio: 1 stack: blt. 1870-71, rebt. 1883; 75' x 16'; 4 stoves (3 Whitwell, 65' x 17'; 1 Kennedy 70' x 18'); 4 steam blowing eng. Conn. coke; Lake ore. *Last active in 1910.* Product: Bessemer pig iron and 10% ferro-silicon, annual cap., 50,000 tons.

Annual capacity of the 58 blast furnaces, 8,660,000 tons of pig iron, spiegeleisen, ferro-manganese; of the 22 steel works and rolling mills, 3,610,000 tons of Bessemer steel ingots, 6,495,000 tons of open hearth steel ingots, 8,346,000 tons of blooms, billets, slabs and sheet and tin plate bars, including forging blooms and forging billets, 1,350,000 tons of standard sections of steel rails, 163,000 tons of light sections of steel rails, 708,775 tons of beams, channels, angles and other structural shapes, 46,800 tons of fitted structural work, 1,232,000 tons of universal, sheared, boiler ship, tank and other plates, 152,500 tons of skelp, 180,000 tons of axles, 88,500

tons of splice bars, 849,000 tons of merchant bars, 744,550 tons of hoop, bands, box and scroll steel and cotton ties, 52,000 tons of railroad ties, 30,000 tons of slack barrel hoops, 34,000 tons twisted bars for concrete work, 15,000 tons finished armor plate, 201,225 tons of iron, brass and steel castings and ingot molds and stools, 137,000 tons of rolled steel wheels and 2,000 tons of other forms of rolled and forged iron and steel products.

WAREHOUSES

The Carnegie Steel Co. (of New Jersey) 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. Connected with the main warehouses at Waverly are shops equipped for punching and riveting structural angles, beams, and channels. The warehouses are located as follows:

Waverly Warehouses, Waverly, Newark, N. J.

New England Warehouse, Allston, Boston, Mass.

Baltimore Warehouse, Bush and Wicomico St., Baltimore, Md.

Cleveland Warehouse, 39th & Superior Sts., Cleveland, Ohio.

Pittsburgh Warehouse, foot of Eleventh St., Pittsburgh, Pa.

Carnegie Tube Co., see 1908 Directory, p. 292. Rolling mill and pipe plant at Carnegie, Pa., acquired by Scott Iron and Steel Co., Feb. 9, 1909. A. O. H. fur. added for steel castings. Recciver appointed July 8, 1911. Acquired by A. A. Hutchinson and others, Dec. 23, 1912, and leased for purposes other than iron and steel manufacture.

CARPENTER STEEL CO. (The), 43 Exeter St., Reading, Pa.

Org. and inc. Nov. 1, 1901. Capital stock: com. auth. \$1,200,000, issued, \$1,000,000; bonds, \$150,000.

Robert E. Jennings, P.; at 100 Broadway, New York City. W. B. Kunhardt, Sc., T. & G. M.; E. J. Poole, G. S.; F. A. Bigelow, G. S. M.; J. S. Pendleton, A. T. & P. A.; at Reading, Pa.

Sales offices:

Birmingham, Young & Vann Supply Co.

Boston, 131 State St.

Chattanooga, John C. Vance.

Chicago, Continental and Commercial National Bank Bldg.

Cleveland, 400 Lakeside Ave.

Hartford, Conn., 189 Allyn St.

New York, 100 Broadway.

New York, 85-91 Lafayette St., Denman and Davis.

Philadelphia, Bulletin Bldg.

Pittsburgh, First National Bank Bldg.

Rochester, N. Y., William B. Burke Iron & Steel Co.

Toledo, Coghlin Machinery and Supply Co.

San Francisco, Cal., Berger & Carter.

Carpenter Steel Works, Reading, Pa.: blt. 1889-90; rebt. after fire 1892; 4 42-pot crucible fur.; 1 B. O. H. fur. (10-ton) added 1913; first O. H. steel made April 20, 1914; 14 heat. fur. (2 2-d. coal-fired hand, 7 3-d. coal-fired hand, 2 4-d. coal-fired hand, 2 4-d. coal-fired Jones stoker, 1 prod. gas cont.) 23 annealing fur.; 6 trains hot rolls (9" 3-h. 6-st., 10" 3-h. 7-st., 12" 3-h. 3-st., 16" 3-h. 6-st., 18" 3-h. 2-st., and 1 continuous merchant and Belgian, with 10" 5-st. upper and 10" 4-st. lower mills); 2 cold trains, 12" 2-h. 1-st., 10" 2-h. 1-st.; numerous cold rolling machines; 8 ham. (600-lb. to 7-ton). Fuel, bituminous coal. Machine shop for jobbing; cold-rolling and wire-drawing plant.

Product: steel for tools, dies, cutlery, files, wire, etc., and chrome-nickel steel for automobile parts, silico-manganese, tungsten, and other special alloy steels. Annual cap., 10,000 tons of crucible ingots, 10,000 tons of O. H. ingots, and 35,000 tons of rolled and forged products.

CARR (W. R.) AND CO., Spartanburg, S. C.

W. R. Carr, P. & T.; E. S. Tennent, Sc.; J. W. Flannery, S.

Selling agents: Eaton, Rhodes & Co., Cincinnati.

Twinlake Furnace at Phelps, Wis.: 1 stack, blt. 1914, f. o. Sept. 25, 1914; cold blast; 1 steam blowing eng.; no boilers. Charcoal; Iron River hematite ore.

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

Carroll Foundry (The), Houghton, Mich. Tropenas steel casting plant, see 1908 Directory, p. 392. Destroyed by fire May 6, 1914.

CARTER IRON CO., Pittsburgh, Pa.

Robert A. Carter, P.; R. A. Carter, Jr., Sc. & T.; at Pittsburgh. Howard H. Carter, V. P. & G. M.; C. R. Huddle, S., at Ivanhoe, Va. Robert A. Carter and Thomas B. Foley, Co-Receiver for Carter Iron Co. and the Monongahela Iron and Steel Co.

Ivanhoe Furnace, Ivanhoe, Va.: 1 stack, 70' x 13' 2"; blt. 1881-2, last rebt. 1906; 3 stoves (2 Whitwell, 1 2-pass Foote, 65' x 16'); 2 steam blowing eng. Pocahontas coke; local and Lake ore. Gray iron foundry; zinc concentrating plant. (Owned and operated by Ivanhoe Furnace Co. which is controlled by Carter Iron Co.) Product: Bessemer, basic and foundry pig iron, annual cap., 25,000 tons.

Paden City Works, Paden City, W. Va.: blt. 1903-5, f. o. 1906; 18 double puddling fur.; 3 sheet and 3 pair fur.; 3 annealing fur.; 20" 3-h. muck mill, 26" x 44" roughing; 3 black sheet mills (1 26" x 44", 2 26" x 38"); 1 cold mill 22" x 44". Fuel, natural gas. Product: muck bar, chemical sheet iron, fine roofing iron, etc. Annual cap., 20,000 tons muck bar and 6,000 tons sheets.

Hays Station Works, Hays Station, Allegheny Co., Pa.: blt. and f. o. 1891; 16 double puddling fur., 4 3-d. heat. fur.; 3 trains (20"

3-h. 2-st. muck mill, 18" 3-h. 2-st. bar, 10" 3-h. 4-st. bar). Fuel, natural gas. (Owned and operated by Monongahela Iron and Steel Co., which is controlled by Carter Iron Co.)

Product: muck bar, merchant bar iron, staybolt iron, iron chains, annual cap., 15,000 tons.

Carteret Steel Co. Blast Furnace at Hackettstown, see 1908 Directory, p. 249, sold to B. Frank Fox in July, 1913.

Cascade Steel Foundry Co. Projected steel castings works at Earlington, Wash., see 1908 Directory, p. 403, abandoned.

Cedartown Iron Co., Anniston, Ala.

Org. and inc. Nov. 28, 1910. Capital stock: \$30,000.

G. B. McCormack, P.; E. Ramsay, 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.* (Formerly owned by Alabama & Georgia Iron Co., acquired by Cedartown Iron Co., Nov. 28, 1910).

Product: charcoal pig iron, annual cap., 20,000 tons.

Company owns iron ore mines: Cherokee Mine at Cedartown, Ga., and Frog Mountain Mine at Spring Garden, Ala.

Central Expanded Metal Co., acquired Jan. 1, 1909, by The Consolidated Expanded Metal Companies. Train of hot rolls at works at Rankin Station, Pa., see 1908 Directory, p. 292, dismantled in 1909.

Central Foundry Co., see 1912 Supplement, p. 52. Works at Oklahoma City, Okla., blt. 1911, removed to Sand Springs, Okla., see Iron and Steel Products Co.

CENTRAL IRON AND COAL CO., 90 West St., New York City.

Org. and inc. 1901; Capital stock: com., \$1,000,000; bonds, \$1,324,000.

Waddill Catchings, P.; deCoursey Cleveland, V. P. & T.; E. McElheaney, Sc.; at New York City. W. L. Kluttz, V. P. & G. M.; C. H. Blacklock, A.; W. M. Joyner, P. A.; at Holt, Ala.

Selling agents: Crocker Bros., 42d St. Bldg., New York City.

Brand: "Tuscaloosa."

Tuscaloosa Furnace at Holt, near Tuscaloosa, Ala.; 1 stack, 85' x 19' 6"; blt. 1901-3; f. o. August, 1903; rebt., 1911-12; 4 Foote stoves, 85' x 19'; 3 steam blowing eng. (45,000 cfm.); 10 water-tube boilers, 2,500 H. P. Coke: brown ore from the company's mines at Friedman, Ala., annual cap., 85,000 tons. Also owns red ore mine (idle) at Valley View, Ala. Connected with the furnace are 164 bee-hive coke ovens (idle), and 60 Semet-Solvay by-product ovens, annual cap., 150,000 net tons of coke. Nodulizing

plant for pyrites cinder of 2 rotary kilns, 8' x 100', annual cap., 72,000 tons.

Product: foundry pig iron, annual cap., 100,000 tons.

CENTRAL IRON AND STEEL CO., Harrisburg, Pa.

Org. and inc. 1897. Capital stock: com. auth. \$5,000,000, issued \$2,245,400; bonds \$1,239,000.

Charles L. Bailey, Jr., J. V. W. Reynders, J. M. Cameron, Receivers; L. D. Perry, C.; Robert H. Irons, G. S.; Francis J. Hall, G. S. A.; W. H. Drinkwater, P. A.

Sales offices:

Baltimore, R. C. Hoffman & Co.

Boston, 131 State St.

Buffalo, W. H. H. Newman & Co.

New York, 66 Broadway.

Philadelphia, Stock Exchange Bldg.

Product: pig iron, sheared and universal plates and sheets, boiler plates, marine and locomotive steel, ship plates, tank plates, bridge and structural plates, etc.

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, remod. 1906, 75' x 16'; 6 Whitwell stoves, (3 60' x 18', 2 50' x 18', 1 70' x 18'); 2 steam blowing eng. (30,000 cfm.); 2 slag granulating pits, annual cap., 117,000 tons. Anthracite coal and coke; various ores. Molten metal to O. H. furnaces. Product: basic, foundry, mill, Bessemer, and malleable Bessemer pig iron, annual cap., 105,000 tons.

Open Hearth Steel Works: blt. 1903-04, first steel made June 9, 1904; 4 B. O. H. fur. (60-ton); to be enlarged to 130 tons each; additional 130-ton basic fur. to be built. Annual cap., 110,000 tons ingots; to be increased to 180,000 or 200,000 tons.

Paxton Rolling Mills: orig. blt. 1869; 6 3-d. heat. fur. (3 coal, 3 gas); 3-h. sheared plate mill, 34" x 126". Fuel, coal and producer gas. Flanging shop. Gray iron foundry and machine shop for own use. Product: sheared plates, annual cap., 80,000 tons.

Central Iron Works: orig. blt. 1853; soaking pit; 42" universal mill with 4 gas heat. fur.; sheared plate mill 3-h. single-stand, 28" x 89" with 3 3-d. coal heat. fur.; sheared plate mill with 2-h. roughing and 3-h. Lauth finishing stands, each 25" x 72", with 2 3-d. coal heat. fur. Fuel, coal and producer gas. Product: universal (80,000 tons) and sheared plates (50,000 tons).

Chesapeake Nail Works, Harrisburg, Pa.: blt. 1867; dismantled 1915.

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 bee-hive coke ovens at Richard, Monongalia County, W. Va. Annual cap., 200,000 tons of coal and 120,000 net tons of coke.

CENTRAL OF GEORGIA RAILWAY CO., Savannah, Ga.

F. F. Gaines, 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. (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; 7 B. O. H. fur. (50-ton); 4 4-hole soaking pits; 34" reversing blooming mill, 28" 3-h. 2-st. bar mill with bull-head finishing pass. Fuel, nat. gas and oil. Power electricity, purchased from power company.

Product: ingots, blooms, sheet bars, alloy sheet bars, etc. Annual cap., 240,000 tons of ingots.

Central Steel Co. (The), Ottawa, Ill.

Fred L. Fischer, P., T., & G. M.; E. H. Trumbo, V. P.; L. P. Fischer, Sc.

Works at Ottawa: blt. 1910-12; 1 scrap fur.; 8" bar mill. Fuel, crude oil. Never operated commercially. *Idle*.

Annual cap., 12,000 tons of iron and steel merchant bars.

Chambersburg Engineering Co., Chambersburg, Pa.

K. A. Derbyshire, P.; H. B. Price, V. P.; James S. Austin, T.; James S. Smith, Sc.; H. F. Derbyshire, G. M.

Works at Chambersburg, Pa.: blt. 1897; 3 A. O. H. fur. added 1906-07, have never been operated.

Product: hydraulic machinery, steam hammers, etc.

CHAMPION HORSE SHOE CO., Pawtucket, R. I.

Org. and inc. 1912. Capital stock: com., \$100,000; pref., \$100,000.

Edwin A. Smith, P.; George L. Bowen, V. P. & G. M.; Donald E. Jackson, Sc. & T.

Brand: "Champion."

Works at Pawtucket: blt. 1905; enl. 1912; first products rolled Aug. 7, 1912; 2 3-d. scrap, 2 3-d. billet heat. fur.; 2 trains (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, bituminous 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.

Chapman Iron, Coal and Coke Co., Inc., see 1908 Directory, p. 327, formerly owned Victoria Furnace at Goshen, Va.; sold the furnace to The Goshen Iron Co., Sept. 1, 1910.

CHARCOAL IRON CO. OF AMERICA, 312 Union Trust Bldg., Detroit, Mich.

Org. and inc., May 12, 1915, succeeding the Lake Superior Iron and Chemical Co. Capital stock: \$2,839,350, pref. 6% cum. \$5,217,250. Frank W. Blair, P.; H. H. Bingham, Sc. & C.; Frank W. Hutchings, T. & G. S. M.; at Detroit. George J. Webster, G. M.; R. F. Birchard, P. A.; at Marquette, Mich.

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. Mar., 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.: 1 stack, 58' x 10', blt. 1860; last rebt. 1907-10, blown in Jan. 7, 1910, by the Northern Charcoal Iron Co.; 2 iron pipe stoves (24" and 32"). Charcoal; Lake ore. Charcoal kilns. Product: foundry, car-wheel, and malleable pig iron, annual cap., 25,000 tons. *Long idle.*

Elk Rapids Plant, Elk Rapids, Mich.: 1 stack, 64' x 11', f. o. July, 1873; rebt. 1902; hot blast. Charcoal; Lake ore. Charcoal kilns; wood alcohol and acetate of lime plant. Machine shop. Product: Nos. 3 and 4 pig iron for car-wheels and malleable castings, annual cap., 35,000 tons.

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.

The 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 150,000 tons of iron ore.

Chartiers Mining and Manufacturing Co., 710 Sellwood Bldg., Duluth, Minn.

Ardis Furnace, Iron Mountain P. O., Mich. 1 experimental Jones "step" rotary fur. blt. 1908: first metal made Oct. 12, 1908; partly dismantled 1914.

Chattanooga Iron and Coal Co. sold Chattanooga Furnace at Chattanooga, Tenn., to Southern Steel Co., July 1, 1906; Southern Iron and Steel Co., successors to above, defaulted on bond interest payments in 1911 and property reverted to bondholders of Chattanooga Iron and Coal Co., which was reorganized as the Chattanooga Iron and Coal Corporation, Jan. 1913.

CHATTANOOGA IRON AND COAL CORPORATION, 14th & Elm Sts., Chattanooga, Tenn.

Org. and inc. Jan., 1913. Capital stock: com. auth. \$1,500,000; pref. auth. \$1,000,000. C. E. Buek, P.; A. W. Chambliss, V. P.; H. R. Lacey, Sc., T., G. M., & G. S. M.; F. K. Rosamond, A.; G. H. Jacoway, P. A.

Brand: "Chattanooga."

Chattanooga Furnace at Chattanooga: 1 stack, 75'x16'; blt. 1905-06, f. o. April 25, 1906; 4 4-pass Whitwell stoves, 60'x18'; 4 steam blowing eng. (30,000 cfm.); 8 water-tube boilers, 2,400 H. P. Coke; red and brown ore from Georgia and Alabama. The company owns iron ore mines at Estelle, Georgia, annual cap., 120,000 tons. Also operates 168 bee-hive ovens at Dunlap, Tenn., annual cap., 5,000 net tons. (Formerly owned and operated by the Southern Steel Co.; later known as the Southern Iron & Steel Co.; acquired by Chattanooga Iron and Coal Company, Nov., 1911, and turned over to the present company Jan., 1913.)

Products: foundry and forge pig iron, annual cap., 75,000 tons.

Chemung Rolling Mill Co., see Elmira Rolling Mill Co.

Chess Brothers, see Central Expanded Metal Co.

CHESTER STEEL CASTINGS CO., 407 Sansom St., Philadelphia, Pa. Org. 1870; inc. 1871. Capital stock: \$10,000.

E. W. Dwight, P. & T., at Phila. Wm. T. Dunning, Sc. & G. M., at Chester.

Sales offices: 214 Fisher Bldg., Chicago; 160 Beale St., San Francisco.

Works at Chester, Pa.; blt. 1871; 3 A. O. H. fur. (20-ton, 1893; 30-ton, 1899; 1½-ton oil burning); 3 gas prod.; 8 cementation fur. for castings. Fuel, coal and oil.

Product: steel castings for sale 1 to 40,000 lb.; annual cap., s. t., 6,250 tons open hearth and 800 tons cementation castings.

Chicago Electric Castings Co., see Bentley-Snyder Co.

Chicago Malleable Castings Co., West Pullman, Chicago, Ill., see 1912 Supplement, p. 45, crucible steel furnaces added 1901 have been

dismantled. Company makes malleable, gray iron and semi-steel castings only.

Chicago-Riverdale Iron & Steel Co., see Riverdale Iron & Steel Co.

CHICAGO STEEL FOUNDRY CO., 3701 So. Kedzie Ave., Chicago, Ill.

Org. and inc. Oct. 16, 1906. Capital stock: com. auth., \$150,000, issued, \$130,000.

David Evans, P. & T.; C. M. Lauritzen, V. P.; at Chicago.

A. I. Gilbert, Sc.; at Riverside, Ill.

Selling agent: David Evans & Co., Rookery Bldg., Chicago.

Works at Kedzie ave. and 37th St: blt. 1912; 6 6-pot crucible fur.; 2 Tropenas converters (1-ton, 2-ton); first crucible and first Tropenas steel made Aug. 13, 1912. Fuel, oil.

Works formerly located at Nineteenth and Rockwell Sts., blt. 1907, dismantled in 1912.

Product: high-manganese and light steel castings, magnetic steel castings for electrical purposes, and alloy steel castings, for sale. Annual cap., 1,500 tons of crucible, 2,500 tons of Tropenas, castings.

Christy Steel Co., see 1908 Directory, p. 371. Crucible steel casting plant at Akron, Ohio, destroyed by fire, Feb. 10, 1913, and not rebuilt. Company dissolved.

CHROME STEEL WORKS, Chrome, N. J.

Ferdinand E. Canda, P.; at 11 Pine St., New York.

F. Mora Canda, Abeel Canda, Wm. Corry, V. P.; Chas. A. Canda, Sc.; Thos. I. Jones, T.; at Chrome, N. J.

Works at Chrome: blt. 1902-4; f. o. Mar. 19, 1904; 3 A. O. H. fur. (2 20 and 1 25-ton); 2 24-pot crucible fur. (not in operation); 12 coal and gas heat. fur.; 3 annealing fur.; 10 oil fur.; 1 Schwartz electric fur., used for melting alloys for O. H. fur.; 1 4,000-ton hydraulic forging press; 1 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 for own use.

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 for sale and for own use. Annual capacity, 40,000 tons open-hearth steel (30,000 tons ingots, 10,000 tons castings); 4,000 tons crucible steel (2,500 tons ingots, 1,500 tons castings); 35,000 tons rolled and 10,000 tons forged products.

Church, John T., Glen Iron, Pa., formerly leased Glen Iron Furnace, see 1908 Directory, p. 275, from Glen Iron Furnace Co. Purchased the furnace Jan. 1, 1909, and rebuilt it in spring of that year. Furnace destroyed by fire July 5, 1913, and not rebuilt.

CINCINNATI HORSE SHOE AND IRON CO. (The), Cleves, Ohio;
telegraph address, Cincinnati, Ohio.

Org. and inc., May, 1907. Capital stock: \$200,000.

Thomas F. Hotchkiss, P.; at Joliet, Ill. J. E. McDaniel, V. P. & G. M.; Charles Rudicil, Sc. & T.; R. H. Miller, G. S.; at Cleves, Ohio.

Works at Cleves: blt. 1906; f. o. Sept. 26, 1906; 10 heat. fur. (2 scrap, 2 billet, and 6 horseshoe, all 4-d.); 3 trains (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., about 9,600 tons of bars and 180,000 kegs of shoes.

CINCINNATI STEEL CASTINGS CO. (The), 1220 Queen City Ave., Cincinnati, Ohio.

Org. 1909; inc., Jan. 4, 1909. Capital stock: \$50,000.

William Gilbert, P.; J. D. Leary, V. P.; F. W. Lammers, Sc., G. M., & G. S.; Fred. B. Salmar, T.; C. G. Heepke, A., & P. A.; V. E. Montgomery, G. S. M.

Works at Cincinnati: blt. 1909; first crucible steel made April 26, 1909; first converter steel made Jan. 11, 1912; 1 6-pot crucible fur.; 1 Whiting converter (1½-ton); 1 cupola. Fuel, gas and oil.

Product: steel castings for sale for automobile, and general machine trade; also alloy castings (vanadium, chrome, and nickel). Annual cap., 300 tons crucible, and 1,500 tons converter steel castings.

Citico Furnace Co., see 1908 Directory, p. 338. Citico Furnace at Chattanooga, Tenn., went out of blast in June, 1911, and was subsequently gradually dismantled.

CLAIRE FURNACE CO., Sharpville, Pa.

Org. 1901. Capital stock: \$250,000.

L. C. Hanna, P.; H. M. Hanna, Jr., Sc. & T.; at Cleveland.

J. W. Robbins, G. M.; at Sharpville.

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

Claire Furnace at Sharpville: 1 stack; 75' x 16', blt. 1869, last rebt. 1906; 4 fire-brick stoves; 4 steam blowing eng. (40,000 cfm.); 7 boilers, (4 tubular, 3 flue) 1,600 H. P. Coke; Lake ore.

Product: Bessemer, malleable, and foundry pig iron. Annual cap., 85,000 tons.

Clare Iron Co. (The), see 1908 Directory, p. 366, Bloom Furnace at Bloom Switch, Ohio, dismantled in 1911 and property sold.

CLARK BROTHERS CO., Olean, N. Y.

Org. and inc. Jan. 26, 1903. Capital stock: com. auth., \$500,000; issued, \$400,000; pref. 7% cum., \$100,000; bonds, \$180,000.

W. P. Clark, P.; J. S. Reid, Sc. & T.; W. M. Moffat, A.; J. M. O'Connor, G. S.; F. H. Light, P. A.; at Olean. C. E. Clark, V. P.; at Wellsville, N. Y.

Works at Olean: 1 Fisher converter (3-ton) added to an iron foundry 1907; first converter steel made Oct., 1907; 2 cupolas. Fuel, oil, Machine shop for own use.

Product: castings for own use in the manufacture of saw mill machinery and engines. Annual cap., 1,500 tons. Also makes gray iron castings; annual cap., 7,500 tons.

Clark Steel Hoop Co., Punxsutawney, Pa.

Org. 1908; inc. July 29, 1908. Capital stock: \$50,000.

J. B. Eberhart, P.; J. W. Osterhout, V. P.; E. C. McKibbin, Sc.; George W. Fink, T.

Works at Punxsutawney: blt. 1908, f. o. Jan. 1, 1909; 1 3-d. billet heat. fur.; 12" 3-h. 1-st. Belgian roughing, 8" 3-h. 5-st. finishing. Fuel, coke.

Product: steel hoops, bands, cotton ties, half ovals, and light shapes. Annual cap., 9,000 tons.

Clearfield Steel and Iron Co., see 1908 Directory, p. 313. Iron rolling mill at Hyde, Pa., formerly leased to A. M. Byers Co.; lease given up May 9, 1908; acquired by Newhall Rolling Mill Co. in June, 1913.

CLEVELAND-CLIFFS IRON CO., Executive offices, Rockefeller Bldg., Cleveland, Ohio.; General offices, Ishpeming, Mich.

Org. and inc. May 9, 1891. Capital stock: com. auth. \$10,000,-000, issued \$4,910,000.

William G. Mather, P.; J. H. Sheadle, V. P.; S. L. Mather, Sc.; R. C. Mann, T. & A.; at Cleveland.

Sales offices: Cleveland, Ohio, Rockefeller Bldg.; Grand Rapids, Mich., Superior Charcoal Iron Co. (agents for pig iron).

Brand: "Pioneer," for pig iron.

The Cleveland Cliffs Iron Co., primarily an iron mining company, also owns the charcoal blast furnace described below and in connection with the furnace a charcoal plant with recovery of by-products.

Pioneer Furnace, Gladstone, Mich.: 1 stack, 60' x 12', blt. 1895-6; f. o. April 16, 1896; 2 hot-blast stoves; 2 steam blowing eng. (12,000 cfm.); 5 water-tube boilers, 625 H. P. Machine shop for own use. Charcoal; Lake ore.

Product: charcoal pig iron, annual cap., 38,000 tons.

At Gladstone the company operates a plant for the manufacture of charcoal with recovery of by-products, wood alcohol, and acetate of lime. The charcoal plant is equipped with 20 80-cord and 50

60-cord charcoal kilns and 10 48-cord charcoal retorts, with a total annual cap. of about 3,000,000 bushels of charcoal, 350,000 gallons of wood alcohol and 5,000,000 pounds of acetate of lime.

IRON ORE PROPERTIES.

The company owns the Lake, Moro, Salisbury, Cliffs Shaft, Lake Angeline, Ogden, and East New York iron ore mines at Ishpeming, Mich.; the Lucy and Jackson mines at Negaunee, Mich.; the Princeton mine at Gwinn, Mich.; the Morris-Lloyd mine at North Lake, Mich.; and the Republic mine at Republic, Mich. The East New York, Moro, Ogden, Jackson, and Lucy mines are idle. The company also leases the Maas mine at Negaunee, Mich., the Crosby mine at Nashwauk, Minn., the Stephenson, Austin, and Gwinn mines at Gwinn, Mich. The company owns or controls the Negaunee and Athens mines at Negaunee, Mich., and the Webster and Imperial mines at Michigamme, Mich. These mines have an annual cap. of 2,500,000 tons of ore.

CLEVELAND FURNACE CO., 1314 Rockefeller Bldg., Cleveland, Ohio. Inc. May 3, 1902; org. May 5, 1902.

Capital stock: com. auth., \$2,000,000, issued, \$1,998,500; bonds, \$480,000.

D. T. Croxton, P.; Wm. G. Mather, V. P.; C. Birdsall Smith, Sc. & T.; J. B. Blackmer, A. Sc. & A. T.; S. R. Greene, G. S.; C. C. Barrett, P. A.; at Cleveland.

Selling agents: Rogers, Brown & Co.

Brand: "Cleveland."

Cleveland Furnaces, Cleveland: 2 stacks; No. 1, 85' x 20', blt. 1902-3; f. o. Aug. 21, 1903; No. 2, 90' x 22', blt. 1907-08; f. o. Sept. 18, 1909; 8 Julian Kennedy 2-pass stoves, 90' x 21'; 7 steam blowing eng. (115,000 cfm.); 21 water-tube boilers, 6,900 H. P.; 1 Uehling double-strand casting machine. By-product coke; Lake ore. Foundry and machine shop for own use. By-product coke plant: 100 Semet-Solvay ovens, annual capacity, 360,000 net tons.

Product: foundry, malleable and basic pig iron, annual cap., 250,000 tons.

CLEVELAND HARDWARE CO. (The), 4518 Lakeside Ave., Cleveland, Ohio.

Org. 1875; inc. 1881. Capital stock: com. auth. \$2,000,000, issued \$1,577,050; pref. 7% cum. auth. \$500,000, issued \$300,000. Charles E. Adams, P. & G. M.; Thomas P. Robbins, 1 V. P. & T.; Malcolm L. McBride, 2 V. P.; William F. Gibbons, Sc. & G. S. M.; H. D. Jones, A.; E. E. Adams, G. S.; W. D. Lewis, P. A.

Selling agents: James R. Swan, 327 W. 4th St., Cincinnati;

James W. Baxter, 195 Pingree Ave., Raymond S. Crotty, 375 Edison Ave., Detroit; Paul W. Andrus, 5700 Etzel Ave., St. Louis.

Works at 4518 Lakeside Ave.: blt. 1879; rebt. 1891; 3 heat. fur. with 2 Duff gas prod. (1 3-d., 1 4-d. regenerative); 1 train, 10" 3-h. 7-st. guide. The company operates 2 forging plants, 1 at the above address and 1 at No. 2 works, 3270 E. 79th St., blt. 1906. Fuel, bituminous coal, producer and natural gas. Machine shop and nut dept. for own use.

Product: rolled shapes for the manufacture of steel forgings for vehicles. Annual cap., 12,000 tons of rolled material, 20,000 tons of forgings.

CLEVELAND STEEL CO. (The), 704 Rockefeller Bldg., Cleveland, Ohio.

Org. and inc. Dec. 8, 1893. Capital stock: com. auth., \$500,000; issued, \$337,000.

L. M. Bowers, P.; at Binghamton, N. Y. J. L. Severance, V. P.; W. J. Brodie, Sc.; at 480 The Arcade, Cleveland. C. E. Terrill, T.; J. C. Jones, A. T. & G. M.; D. P. Veach, G. S.; A. C. Baker, P. A.; at Rockefeller Bldg., Cleveland.

Selling agents:

Chicago, 208 S. LaSalle St., J. V. Cowling & Co.

Detroit, Ford Bldg., F. Walter Guibert.

Kansas City, Mo., Finance Bldg., George T. Cook.

Los Angeles, Stimson Bldg., C. F. Lape.

St. Louis, Chemical Bldg., Beckwith Bros.

St. Paul, Merchants Bank Bldg., Rank & Goodell.

Works at foot of East 38th St.: blt. 1853; rebt. 1873 and 1891; remodeled 1894; 4 cont. gas heat. fur.; 2 3-h. 72" plate and sheet mills (1 roughing and 1 finishing). Fuel, natural and producer gas and coal.

Product: No. 12 and heavier plates up to 64" wide and 300" long, annual cap., 60,000 tons.

CLEVELAND STEEL CASTING CO. (partnership), Cleveland, Ohio.

W. W. Balkwill and G. W. Balkwill, owners.

Works at Hubbard St. and Cleveland & Pittsburgh R. R., Cleveland: blt. 1893, f. o. Jan. 9, 1895; 2 A. O. H. fur. (15-ton, 25-ton). Fuel, natural gas.

Product: steel castings for sale, annual cap., 9,600 tons.

CLINTON IRON AND STEEL CO., West Carson St., (P. O. box 177)

South Side, Pittsburgh, Pa. Org. June 11; inc. July 9, 1889.

F. N. Hoffstot, P.; at New York. C. W. Friend, V. P.; T. W. Friend, Sc. & T.; at Pittsburgh.

Sales office: 350 Broadway, New York City.

Brands: "Clinton," "Hector."

Clinton Furnace, Pittsburgh: 1 stack; 76' x 18'; blt. 1859; last rebt. 1913; 4 Foote hot-blast stoves; 3 steam blowing eng. (60,000 cfm.); 6 water-tube boilers, 2,750 H. P. Pig iron casting machine. One slag gran. pit, annual cap., 70,000 tons. Coke; Lake ore.

Product: Bessemer, basic, malleable, and forge pig iron, special car-wheel pig iron, and a soft and fluid foundry iron for light work and fine machinery castings. Annual cap., 110,000 tons.

COES WRENCH CO., Loring Coes & Co., Inc., Dept., 1 Coes Square, Worcester, Mass.

Org. June, 1902; inc., June 24, 1902. Capital stock: \$150,000: Frank L. Coes, P., T., G. M., & P. A.; Fred Searle, V. P. & S.

Selling agent: W. E. Robbins, 29 Murray St., New York City.

Works at Worcester: orig. blt. 1846; 2 2-d. billet rehear. fur., 6 forge fires, 3 trains hot rolls (9" 2-h., 2 10" 2-h.); 4 ham. (200 to 600-lb.). Fuel, anthracite coal and oil. Machine shop for own use. Steam and electric power.

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 of knife stock and 200 tons of die stock.

Coffin, Charles E., see 1908 Directory, p. 322, formerly owned Muirkirk Furnace, Muirkirk, Md., see The Muirkirk Iron Corporation.

COHOES ROLLING MILL CO., Cohoes, N. Y.

George H. Page, P. & T.; S. T. Page, V. P.; A. W. Powers, Sc. Works at Cortland and Canvass Sts., Cohoes: blt. 1854, rebt. 1883; 14 double puddling fur.; 2 busheling fur.; 3 gas heat. fur.; 3 trains (22" muck and 10" and 16" grooved skelp); water 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 welding fur.; 1 coupling fur.; sizes from 1/4" to 2", butt welded, annual cap., 30,000 tons. Galvanizing dept.

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: Hartford, Conn., Main St., Conn. Mutual Bldg. Sales agents: New York City, 212 Water St., Collins & Co.

Works at Collinsville, Conn.: 2 2-d. scrap and 4 2-d. heat. fur., 2 trains (18" 2-h. 3-st., 10" 2-h. 3-st.); 2 steam ham., 3 20-ton steel cementing fur., 2 Siemens gas crucible fur. (1 24-pot, 1 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, Pa.

Org. and inc. May 22, 1899. Capital stock: \$300,000.

C. M. Smith, P. & T.; F. G. Gottsch, Sc.; M. L. Washburn, P. A.; at 149 Broadway, New York. Wm. Lauder, V. P.; E. P. Ross, G. S.; at Riddlesburg, Pa.

Selling agents: Henry H. Adams & Co., 149 Broadway, New York.

Brands: "Colonial", "Norway", and "Kemble".

Furnace at Riddlesburg: 1 stack; 75' x 18'; blt. 1911; blown in Dec. 7, 1911; 3 McClure stoves, 75' x 18'; 2 steam blowing eng. and 1 turbo-blower (30,000 cfm.); 5 boilers (3 water-tube, 2 tubular) 1,350 H. P.; slag granulating pit. Machine shop for own use. Broad Top coke made from coal mined on the furnace property; 198 bee-hive ovens, annual cap., 80,000 gross tons. Lake and local ore from own mines at James Creek, Pa., annual cap., 35,000 tons; limestone quarries at McConnellstown, Pa., annual cap., 50,000 tons. (2 alternate stacks, 60' x 14', blt. 1868, and 1870, dismantled 1911.)

Product: strong, soft, fluid foundry pig iron, annual cap., 75,000 tons.

COLONIAL STEEL CO., 324 Fourth Ave., Pittsburgh, Pa.

Inc. June 3, 1901; org. June 4, 1901. Capital stock: com. auth. \$1,250,000, issued \$1,219,100; pref. 7% cum. auth. and issued \$750,000.

J. B. Finley, P.; W. H. Nimick, V. P.; Chas. M. Brown, Sc.; T. H. Childs, T.; Horace Sisler, A.; Charles M. Brown, G. S. M.; E. H. Ridgway, P. A.; at Pittsburgh, Pa. D. W. Dunlevy, G. S.; at Colona, Pa.

Branch offices and warehouses:

Boston, 84 High St.

Chicago, 213 West Lake St.

New York, 177 Hudson St.

Sales offices:

Denver, 222 First National Bank Bldg.

Detroit, 100 Brush St. (stock carried).

St. Louis, 721 Olive St.

Sales representatives:

Attleboro, Mass., George L. Claflin Co.

Cincinnati, Cincinnati Iron & Steel Co.

Cleveland, The Betz-Pierce Co.

Erie, Pa., Erie Mfg. & Supply Co.

Philadelphia, Einwechter & Wyeth.

Rochester, N. Y., Louis Ernst & Sons.

Brands: "Colonial" and "Red Star".

Works at Colona, Pa.: telegraph address Monaca: blt. 1901-02; enl. 1906; 6 24-pot and 2 36-pot Siemens crucible fur. (216 pots); first crucible steel made Mar., 1902; O. H. added 1906; first steel made Aug. 8, 1906; 2 stationary B. O. H. fur. (25-ton, 35-ton); 6 soaking pits. Rolling mill and forge blt. 1901-2; 11 single puddling fur.; 1 squeezer, 29 heat. fur. (14 1-d., 2 2-d., 9 3-d., 4 4-d.); 13 gas prod.; 7 annealing fur. (1 box, 6 pipe); 4 pickling tanks; 3 forge fires; 9 ham. (600 to 12,000-lb.); 9 trains (28" 2-h. 1-st. reversing blooming, 18" 3-h. 1-st. muck, 9" 3-h. 6-st., 12" 3-h. 6-st., 16" 3-h. 5-st. bar, 28" 3-h. 2-st. plate and saw, two 18" 2-h. 3-st. sheet, 22" 2-h. 4-st. plow); first products forged Feb., 1902; first products rolled May, 1902. Fuel, coal, producer and nat. gas. Machine shop for own use.

Product: crucible and O. H. steel ingots, crucible steel bars, sheets, plates, circular saw plates, forgings, high-speed and carbon tool steel, and crucible and O. H. merchant steel, nickel and alloy steel; also copper-clad steel bars. Annual cap., 17,000 tons crucible ingots, 30,000 tons O. H. ingots and 25,000 tons of finished rolled and forged products.

COLORADO FUEL AND IRON CO., Denver, Col.

Org. and inc. Oct. 21, 1892. Capital stock: com. auth. \$44,200,000, issued \$34,235,500; pref. 8% cum. auth. and issued \$2,000,000; bonds \$45,075,000.

J. F. Welborn, P.; C. J. Hicks, A. P.; J. Chilberg, V. P. & M. S.; S. G. Pierson, V. P. & G. P. A.; J. A. Writer, Sc. & T.; A. D. Moss, A. T.; R. L. Hearon, T. M.; F. H. Bentley, A.; at Denver. Starr J. Murphy, V. P.; E. V. Cary, A. Sc.; at New York. J. B. McKennan, G. M.; E. H. Weitzel, M. Fuel Dept.; F. E. Parks, M. Minnequa Works; at Pueblo, Col.

Sales offices:

Amarillo, Texas.

El Paso, Texas, 607 Mills Bldg.

Fort Worth, Texas, 503 Fort Worth Nat'l Bank Bldg.

Hastings, Neb., Bostwick Hotel.

Hutchinson, Kansas, 503 First Nat'l Bank Bldg.

Los Angeles, Cal., 510 Central Bldg.

Oklahoma City, Oklahoma.

Portland, Ore., 512 Lewis Bldg.

Salina, Kansas.

Salt Lake City, Utah, 408 Walker Bank Bldg.

San Francisco, Cal., 614 Balboa Bldg.

Spokane, Wash., 622 Paulson 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 mill, spike factory and bolt and nut factory, cast iron pipe and other foundries, auxiliary shops, etc.

Minnequa Furnaces: 6 stacks:

Furnace.	Size.	Built.	Reblt. or remod.	Stoves.		First Blown in.
				No.	Size.	
A	80' x 21'	1900-01		4	106' x 21'	Sept. 4, 1901.
B	75' x 17'	1890-91	1901	{ 3 1	{ 70' x 18' 93' x 21' }	Nov. 25, 1892.
C	75' x 16' 6"	1880-81	1893	5	60' x 15' 5"	Sept. 10, 1881.
D	80' x 21'	1901-02		4	106' x 21'	Nov. 20, 1902.
E	90' x 20'	1901-02		4	100' x 21'	May 30, 1903.
F	85' x 20'	1902		4	102' x 21'	May 2, 1907.

Trinidad coke; ore from company's mines in Colorado, Wyoming and New Mexico. Two casting machines (1 Uehling, 1 Heyl & Patterson). Molten metal to steel works.

Product: Bessemer, basic, and foundry pig iron, spiegeleisen and ferro-manganese, annual cap., 625,000 tons.

Bessemer Dept.: orig. blt. 1881-2, f. o. April 11, 1882, rebt. 1901-02; 2 Bessemer converters (15-ton); 2 mixers (250-ton); 6 cupolas (3 pig iron, 3 spiegel); ferro-manganese heating furnace. Fuel, coal, coke and oil. Annual cap., 600,000 tons of ingots.

Open Hearth Dept.: blt. 1902-03, f. o. June 29, 1903; 15 B. O. H. fur. (60-ton); 1 mixer (250-ton). Fuel, prod. gas. Dolomite calcining plant. Annual cap., 540,000 tons of ingots.

Rail Mill: orig. blt. 1881-2, f. o. Apr. 17, 1882, 6 4-hole soaking pits (cap. 144 ingots); 2 bloom reheat. fur.; 3 trains (36" reversing blooming; 28" 3-h. roughing; 26" 3-h. finishing). Annual cap., 360,000 tons of Bessemer and open-hearth steel rails.

Blooming and Billet Mill: blt. 1902-3, f. o. June 29, 1903; 5 4-hole soaking pits (cap. 120 ingots); 40" reversing blooming and billet mill. Annual cap., 350,000 tons of blooms and billets.

Merchant Mill: 5 heat. fur.; 3 trains (20", 12", and 9"). Annual cap., 60,000 tons iron and steel bars, steel mine rails, splice bars, structural and other shapes.

Merchant Mill: begun 1902, not finished, work suspended. For proposed equipment, see 1908 Directory p. 227. Two trains (14" and 12") completed and put in operation Aug. 16, 1907. Annual cap., 120,000 tons of merchant bars.

Wire Rod Mill: blt. 1902-03; 4 cont. heat. fur.; 1 cont. roughing and 2 Garrett rod mills. No. 2 equipped in 1905 to roll merchant bars. Annual cap., 120,000 tons of wire rods; 120,000 tons of merchant bars.

Total annual cap. of steel works and rolling mills: 600,000 tons of Bessemer ingots, 540,000 tons of open hearth ingots, 360,000 tons of rails, 350,000 tons of blooms and billets, 300,000 tons merchant bars, etc., 120,000 tons wire rods.

Sheet and Tinplate Mills: begun 1902, not completed, work suspended. See 1908 Directory, p. 228.

Wire and Wire Nail Dept.: blt. 1902-03; f. o. July 14, 1903; 358 wire drawing blocks, 280 wire nail mach.; 6 staple, 96 barbed wire mach. Product: bright, annealed and galvanized wire, wire nails, staples, barbed wire, field fence, poultry netting, bale ties, etc. Annual cap., 200,000 tons wire, fencing, etc.; 2,500,000 kegs wire nails and staples.

Spike Factory: 6 automatic, 6 hand-machines. Annual cap., 40,000 tons railroad and boat spikes.

Bolt and Nut Factory, annual cap., 10,000 tons of track bolts, pipe bands, machine and other bolts, nuts, and rivets.

Cast Iron Pipe Foundry: blt. 1890, f. o. Dec., 1890: annual cap., 18,000 tons cast iron gas and water pipe and specials, 3" to 20" dia.

Auxiliary Depts.: Iron, brass and steel foundries for own use only; annual cap., 2,000 tons open hearth steel castings. Machine, boiler, blacksmith, roll-turning, pipe-fitting, electric repair, carpenter, and pattern shops; pattern storage and supply storehouses. Electric light and power stations, water works and pumping stations.

Iron Ore Properties: The Colorado Fuel and Iron Co. owns and controls the Sunrise and Chicago mines in Laramie Co., Wy., and the Orient mine in Saguache Co., Col., with an annual cap. of 1,000,000 tons. It leases the Fierro mine in Grant Co., N. M., annual cap., 200,000 tons. The company also owns and leases iron-ore properties in Colorado, Wyoming, Utah, New Mexico, and California. Total annual cap. of the active mines owned, controlled, or leased, 1,200,000 tons.

Coal and Coke Properties: The Colorado Fuel and Iron Co. 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, Tercio, Cuatro, Quinto, Morley, and other points in Colorado. The annual capacity of these mines is about 6,000,000 tons.

It also owns and operates 2,972 coke ovens at Sopris, Starkville, Crested Butte, Cardiff, Redstone, Tabasco, Segundo, and Tercio, Colorado; with an annual cap. of 1,500,000 net tons. It also operates large limestone and dolomite quarries at Lime and Calcite in Colorado.

The Colorado Fuel and Iron Co. owns and controls the Crystal River R. R. Co., which operates 21 miles of standard and 12 miles of

narrow gauge track in Garfield and Pitkin Counties, Col., connecting with the Denver and Rio Grande R. R. at Carbondale, Col. It also owns the Colorado and Wyoming Ry. The Northern division of this company operates 17.89 miles of standard-gauge track in Laramie Co., Wy., extending from Hartville Junction to Sunrise, connecting with the Colorado and Southern Ry. at Hartville Junction and with the Burlington at Guernsey. The Middle division operates 94.64 miles of track in and around the Minnequa Steel Works, at Pueblo, and connects with all railroads entering Pueblo. The Southern division operates 58.2 miles of standard gauge track in Las Animas Co., Col., extending from Jansen to Cuatro, Col., and connecting with the Atchison, Topeka, and Santa Fe Ry. at Jansen and with the Colorado and Southern Ry. and the Denver and Rio Grande R. R. at Sopris.

COLUMBIA STEEL CO., 503 Market St., San Francisco, Cal.

Org. and inc. July, 1909. Capital stock: com. auth. \$500,000; issued \$380,500.

W. E. Creed, P.; C. M. Miall, V. P. & G. M.; Charles S. Cole, Sc. & T.; at San Francisco. D. H. Botchford, M. Pittsburg Works, at Pittsburg, Cal. A. M. Clark, M. Portland Works.

Sales offices: Portland, Ore., 10th & Johnson Sts.; San Francisco, Cal., 503 Market St.

Product: carbon and alloy steel castings for machinery: nickel, manganese, chrome, and other alloy steel castings.

Pittsburg Works, Pittsburg, Cal.: blt. 1909-10; 1 B. O. H. fur. (20-ton); first steel made Nov. 15, 1910; 1 surface-blown converter (2-ton) blt. 1913; first converter steel made Mar. 1, 1913. Fuel, oil. Machine shop for own use. Product: steel castings for sale, annual cap., 4,800 tons of open hearth and 2,400 tons of converter steel castings. May install an electric steel furnace.

Portland Works, Portland, Oregon: blt. 1903; first steel made May 1, 1903; 1 surface blown converter (2-ton), 2 cupolas, 1 annealing fur. Fuel, oil. Machine shop for own use. Product: steel castings for sale, annual cap., 2,400 tons.

COLUMBIA TOOL STEEL CO., Chicago Heights, Ill.

E. T. Clarage, P.; Frank Matthiessen, V. P.; Alexander B. Peterson, Sc.; M. H. Kilgallen, T.

Sales offices:

Chicago, 552-554 W. Lake St.

Cincinnati, 112 W. 2nd St.

Cleveland, 1289-1293 W. 6th St.

Milwaukee, 137 Sycamore St.

Works at Chicago Heights: blt. 1904-5; 2 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 1 2-h. and 3 3-h. st.; 9" with 3 4-h. and 2 2-h. st.); first products rolled May 15, 1905. Fuel, bit. coal and prod. gas. Product: rolled and hammered tool steel and crucible machinery steel, annual cap., 4,000 tons.

Columbus and Hocking Coal and Iron Co., formerly owned Bessie Furnace, New Straitsville, Ohio. Furnace sold to Bessie Furnace Co. in 1913.

COLUMBUS CHAIN CO. (The), Columbus, Ohio.

Org. and inc. 1900. Capital stock: com. \$200,000; pref. 6% cum. auth., \$300,000, issued, \$240,000.

C. M. Wambough, P.; A. R. Markel, Sc.

The company operates chain works at Columbus, Ohio, and Lebanon, Pa.

West End Works, Lebanon, Pa.: blt. 1872-4; 4 double puddling fur., 2 3-d. heat. fur.; 3 trains (20" 2-h. 1-st. puddle, 14" 3-h. 1-st., 8" 3-h. 2-st. finishing). Fuel, bit. coal and coke. Rolling mill idle and for lease. Annual cap., 10,000 tons.

Chain Works erected 1884; product hand made chains for cranes, dredges, marine railways, and ship cables; also pitch chains. Annual cap., 1,200 tons. (Formerly owned and operated by the West End Iron Co.; acquired by the Iron and Steel Products Co., June 9, 1909; bought by the Columbus Chain Co., Oct., 1912; and chain department operated by this company. The rolling mill was leased by the Lebanon Valley Iron and Steel Co. from Jan. 14, 1913, to Jan. 1, 1915.)

COLUMBUS IRON AND STEEL CO. (The), Columbus, Ohio.

Org. and inc. Nov. 21, 1889. Capital stock: com., \$1,000,000; pref. 6% cum. \$500,000.

J. G. Battelle, P.; J. H. Frantz, V. P. & G. M.; J. C. Miller, Sc., T. & G. S. M.; C. M. Fenton, A. & P. A.; H. W. Linhardt, S. Brand: "Buckeye."

Works at Columbus: 2 stacks; each 75' x 17', 1 blt. 1900 and blown in Oct., 1900; the other blt. 1900-01 and blown in Feb., 1901; 8 Foote stoves, 75' x 18'; 5 steam blowing eng. (73,500 cfm.); 9 water-tube and 3 tubular boilers, 4,825 H. P.; 2 slag granulating pits, annual cap., 100,000 tons. Machine shop for own use, sintering plant to be erected. West Virginia coke; Lake ore.

84 beehive coke ovens at Marting, W. Va., annual cap., 38,000 tons. Company is interested in mining properties on the Gogebic and Mesabi ranges.

Product: Bessemer, basic, malleable and foundry pig iron, annual cap., 175,000 tons.

COMMONWEALTH STEEL CO., 1626 Pierce Bldg., St. Louis, Mo.

Org. and inc. July, 1902. Capital stock: \$3,000,000.

Clarence H. Howard, P.; H. C. Bellville, A. P.; H. M. Pflager,

V. P.; Thomas K. Niedringhaus, V. P.; George K. Hoblitzelle, V. P. & T.; George E. Howard, V. P. & S. M.; Frank L. Morey, Sc.; John J. Creighton, A.; A. W. Carten, P. A.; at St. Louis. William E. Hoblitzelle, G. M.; R. A. Bull, G. S.; at Granite City, Ill.

Works at Granite City, Ill.: blt. 1902; 4 B. O. H. fur. (20-ton); first steel made Sept. 8, 1902. Fuel, oil. Machine shop for own use. Product: railroad steel castings for sale, annual cap., 40,000 tons.

Commonwealth Title Insurance and Trust Co. (The), trustee, 1201 Chestnut St., Philadelphia, Pa.

Marietta Works, Marietta, Ohio: blt. 1902-3; f. o. April 15, 1903; 4 sheet, 4 pair, 4 annealing fur.; 4 hot black plate mills (one 28", three 32"); 4 stands 36" cold mills; 9 tinning sets, 3 for tinplates, 6 for terne plates. Fuel, nat. gas and bit. coal. (Formerly owned by the Union Sheet and Tin Plate Co., declared bankrupt 1910; acquired by Commonwealth Title Ins. and Trust Co. as trustee for bondholders and sold. Will be acquired by Pittsburgh Sheet and Tin Plate Co.

Annual cap., 12,000 tons black plates, 45,000 boxes tinplates, 90,000 boxes terne plates.

CONNOLLY STEEL CASTING CO., lessee, Clark Ave., near Webster Ave., Chelsea, Mass.

Org. and inc. Oct. 17, 1910. Capital stock: com. \$1,500.

James Connolly, P., G. M., & P. A.; John Ashman, T.; Archibald Munroe, Sc.

Works at Chelsea: blt. 1900; 2 6-pot crucible fur., f. o. Oct. 29, 1910. Fuel, oil. (Formerly operated by Lundin Steel Casting Co.; 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 automobiles, machinery, tools, dies, etc., for sale, annual cap., 150 tons.

CONNORS-WEYMAN STEEL CO., Brown-Marx Bldg., Birmingham, Ala.

Org. May, 1908; inc. Sept., 1908. Capital stock: com., \$100,000; bonds, \$30,000.

G. W. Connors, P. & G. M.; W. M. Hoke, Sc., T., & P. A.; at Birmingham, Ala. S. T. Weyman, V. P.; at Atlanta, Ga. J. H. McDaniel, G. S.; at Helena, Ala.

Works at Helena, Ala.: begun 1873; enl. 1889; 2 single puddling fur.; 1 rotary squeezer; 2 coal-fired cont. heat. fur.; 3 trains (18" 2-h. muck with separate roughing and finishing rolls, 16" 3-h. 3-st. bar, 9" 3-h. 5-st. hoop and tie). Fuel, bituminous coal. Machine shop for own use. Wrought pipe plant dismantled 1908. (Formerly owned by E. H. Thornton and called Alabama Tube and Iron Works; acquired by present owners June, 1908).

Product: steel hoops, cotton ties, and bars and bands, annual cap., 20,000 tons.

Consolidated Expanded Metal Companies, see Central Expanded Metal Co.

COOK (A. D.), Lawrenceburg, Ind. (owner).

Works at Lawrenceburg, blt. 1900; 3 6-pot crucible fur., f. o. June, 1910. Fuel, oil. Annual cap., 45 tons crucible steel castings.

Rolling mill: 4 heat. fur.; 2 trains, 2-h. single st. Roll pump rod joints from purchased iron bars. Fuel, oil. Annual cap., 200 tons. Gray iron foundry (100 tons).

Product: iron pump rods and castings for own use.

Copake Iron Works, see W. A. Miles.

COPPER CLAD STEEL CO., Arrott Bldg., Pittsburgh, Pa.

Works at Rankin, Pa.: rolls for copper clad rods and shapes.

Cornwall Iron Co., owns the Bird Coleman Furnaces and North Cornwall Furnace leased to the Lackawanna Iron and Steel Co., see Lackawanna Steel Co.

COWIN (FREDERICK) & CO., Inc., 4201 Halsted St., Chicago, Ill.
Org. and inc., Mar. 1, 1913. Capital stock: com., \$500,000; pref., 7% cum., \$250,000.

F. Cowin, P.; L. B. Patterson, Sc. & T.

Works at Joliet, Ill.: blt. June, 1907; f. o. Aug. 27, 1908; 4 double puddling fur.; 1 2-d. billet heat. fur., 5 4-d. reverb. heat. fur.; 1 squeezer; 4 trains (22" 3-h. 3-st. muck, 16" 3-h. 3-st. bar, 12" 3-h. 5-st. guide, 8" Belgian mill with one 12" st. and 4 8" sts.); 2 cranes, 6 shears. Fuel, bituminous coal. (Formerly owned and operated by Joliet Iron Products Co.; acquired, May 1, 1911, by the Joliet Rolling Mill Co.; acquired by present owners, Mar. 1, 1913).

Product: merchant bar iron, rounds, squares and flats, annual cap., 50,000 tons.

CRANBERRY FURNACE CO. (The), Johnson City, Tenn.

Inc. Sept. 6, 1901; org. Sept. 7, 1901. Capital stock: \$100,000.

F. P. Howe, P.; Hammond Prosser, Sc. & T.; at Johnson City. Ario Pardee, V. P.; at Philadelphia.

Offices: Newark, N. J., 763 Broad St., Prudential Bldg.; Philadelphia, 253 Drexel Bldg.; and Johnson City, Tenn.

Sales office: New York, Crocker Brothers (agents).

Brand: "Cranberry."

Cranberry Furnace, Johnson City, Tenn.: 1 stack, 75' 9" x 17', f. o. Jan. 2, 1899; 4 Whitwell stoves, 69' x 18'; 3 steam blowing eng. (21,000 cfm.); 12 flue boilers, 850 H. P. Coke; Cranberry

ore from the company's mines, annual cap., 70,000 tons. Owns limestone quarries at Milligan, Tenn., annual cap. 40,000 tons. Machine shop for own use.

Product: low-phosphorus pig iron, annual cap., 36,000 tons.

CRANE CO., Chicago, Ill.

Org. 1855; inc. 1865. Capital stock: com. \$17,000,000; bonds, \$15,000,000.

R. T. Crane, Jr., P.; John B. Berryman, 1 V. P.; A. D. MacGill, 2 V. P. & T.; R. B. Stiles, A. T.; H. C. Fuller, 2 A. T.; E. H. Raymond, Sc.; C. B. Little, A. Sc.; D. G. Park, 2 A. Sc.; P. T. Kelly, A.; W. A. Beville, P. A.

Plants at Chicago, Ill., and Bridgeport, Conn. Forty-five branch warehouses in the large cities.

Chicago Valve Works, Chicago: manufacture of valves and fittings est. 1855; steel foundry added 1906-7; 2 Zenzen converters (1½-ton); 1 cupola; first steel made Jan. 2, 1907.

Product: soft steel for own use for valves and fittings, annual cap., 5,600 tons. Also makes brass, gray iron, ferro-steel, and malleable iron castings.

Crane Iron Works, see Empire Steel and Iron Co.

CROWLEY (JOHN A.) CO., 120 Liberty St., New York, N. Y.

Org. 1904; inc. 1911.

John A. Crowley, P. & T., at 120 Liberty St., New York. John D. Scott, V. P. & G. S. M.; Joseph L. Dixon, G. S.; E. F. Studley, Sc. & P. A.; at Detroit, Mich.

Works at Detroit, Mich.: construction commenced Feb., 1915; completed June 10, 1915; one 6-ton 2-phase Grönwall electric fur.; 3 trains (18" 2-h., 12" 3-h., 9" 3-h. bar mills). Fuel, electricity and coal. Adding 2 electric fur., will increase ingot cap. to 18,000 tons.

Product: alloy steel ingots and bars; annual cap., 8,000 tons ingots, 30,000 tons rolled products.

Crucible Casting Co. (The), Lima, Ohio. Org. and inc. Aug., 1912; succeeded by The Lima Steel Casting Co., 1915.

CRUCIBLE STEEL CO. OF AMERICA, Oliver Bldg., Pittsburgh, Pa.

Inc. July 21, 1900. Capital stock: com. auth. \$25,000,000. issued \$24,578,400; pref. 7% cum. auth. and issued \$25,000,000. Herbert DuPuy, Ch.; C. C. Ramsey, P.; John A. Sutton, 1 V. P.; J. W. Dougherty, 2 V. P.; G. W. Sargent, 3 V. P.; O. H. Wharton, A. P.; G. A. Turville, Sc. & T.; G. M. Black, G. S.; James Brennan, C. E.; Reuben Michener, G. S. A.; John W. Todd, P. A.; at Pittsburgh. H. A. Brown, 4 V. P.; at New York.

Sales offices:

Baltimore, 8 South Frederick St.

Boston, 381 Congress St.

Buffalo, 69 Carroll St.

Chattanooga, Newby & Foundry Sts.
 Chicago, 650 Washington Blvd.
 Cincinnati, 209 West Third St.
 Cleveland, 721 Lakeside Ave., N. W.
 Denver, 1225 Wazee St.
 Detroit, 473 Lafayette Blvd.
 Hartford, 70 Market St.
 Indianapolis, 437 South Illinois St.
 Louisville, 331 West Main St.
 Milwaukee, 112 Clybourn St.
 Montreal, 19 St. Peter St.
 New Haven, 336 York St.
 New York, 420 Canal St.
 Philadelphia, 523 Arch St.
 Providence, 116 Clifford St.
 St. Louis, 1518 North 9th St.
 St. Paul, Endicott Bldg.
 San Francisco, 536 Folsom St.
 Seattle, 1014 First Ave.
 Springfield, Mass., 118 Liberty St.
 Syracuse, N. Y., Fayette & Magnolia Sts.
 West Toronto, 163 Richmond St.

Foreign sales offices :

Berlin, 27 Berlin Prenzlauer St.
 Glasgow, Scotland, 37 Cadogan St.
 London, England, 31 Borough Rd., S. E.
 Paris, France, 105 Blvd. de Menilmontant.
 Petrograd, Russia, 28 Nevsky Prospekt.

Properties : The company owns the entire capital stock of the Pittsburgh Crucible Steel Co., the Syracuse Crucible Steel Co., and the Crucible Fuel Co. and a controlling interest in the 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.

Crescent Works, Pittsburgh, Pa.

La Belle Works, Allegheny, Pa.

Norwalk Works, Norwalk, Ohio. (leased).

Sanderson Works, Syracuse, N. Y.

Singer-Nimick Works, Pittsburgh, Pa.

Spaulding-Jennings Works, Jersey City, N. J.

The following works formerly operated by the Company (see 1908 Directory, pp. 162-164 and 1912 Supplement, p. 13) have been dismantled.

Aliquippa Works, Aliquippa, Pa., dismantled in 1913.

Anderson-DuPuy Works, McKees Rocks, Pa. Steel works dismantled and new spring works erected.

Canton Steel Works, Canton, Ohio, dismantled and property sold in 1911.

Howe, Brown & Co. Works, Pittsburgh, Pa., dismantled in 1909.

Property sold, part in 1909, rest in 1911.

Anderson-DuPuy Spring Works, McKees Rocks, Pa. Product: heavy coil and flat springs for railroad and government service, annual cap., 20,000 tons.

Atha Works, Harrison, N. J.: blt. 1888-9; 2 30-pot and 2 48-pot crucible fur., annual cap., 10,000 tons ingots; 1 A. O. H. fur. (20-ton, 1907), 1 B. O. H. fur. (50-ton, 1913); annual cap., 12,000 tons acid, 30,000 tons basic ingots; 1 Heroult electric fur. (5-ton), f. o. Dec. 8, 1913, annual cap., 7,500 tons; 68 heat. fur. (7 1-d., 12 2-d., 26 3-d., 23 4-d.); 6 trains (16" 3-h. 5-st., 12" 3-h. 4-st., 9" 3-h. 4-st., 8" 3-h. 5-st., 10" 3-h. 7-st. bar mills, 9" 3-h. 11-st. wire rod); 23 steam ham.; 1 hydraulic forging press (1,500-ton); 5 annealing fur.; 5 pickling tanks. Fuel, coal. Machine shop for jobbing and own use. Product: open hearth ingots, tool, die, spring and cutlery steel, merchant bar, wire rods, and forgings. Annual cap., 59,500 tons ingots, 25,000 tons rolled products, 12,000 tons forgings.

Black Diamond Works, 30th St., Pittsburgh, Pa.: blt. 1862; 2 24-pot, 1 30-pot, 2 42-pot, 6 48-pot crucible fur., annual cap., 30,000 tons ingots; 3 A. O. H. fur. (two 18-ton, one 30-ton), annual cap., 29,000 tons ingots; 5 B. O. H. fur. (three 30-ton, one 45-ton, one 50-ton), annual cap., 68,500 tons; 1 5-hole soaking pit; 31 reverb. heat. fur. (5 2-d., 12 3-d., 11 4-d., 3 5-d.); 10 regen. heat. fur. (4 4-d., 6 6-d.); 6 pair and 6 sheet fur.; 20 trains (27" 2-h. 1-st. blooming; 18" 3-h. 1-st., 16" 3-h. 1-st. cogging; 21" 2-h. 3-st., 18" 2-h. 2-st. bar mills, 14" 3-h. 4-st., 14" 3-h. 5-st., 12" 3-h. 4-st., 10" 3-h. 4-st., 10" 3-h. 4-st., 10" 3-h. 5-st., 9" 3-h. 5-st. guide mills; sheared plate mill 32" x 115" for boiler plate, single stand; sheared plate mill with separate roughing and finishing stands 26" x 86" for saw plate; 5 jobbing plate mills with 1 cogging stand, all 20"); 2 sets pointing rolls; 5 open, 9 box annealing fur.; 12 pickling tanks; 25 steam ham. (750-lb. to 5-ton). Fuel, coal and natural gas. Crucible factory. Machine shop for own use. Product: hammered and rolled crucible and open hearth steel of all kinds, annual cap., 127,500 tons ingots, 142,000 tons finished rolled, and 8,000 tons forged products.

Crescent Works, 49th to 51st Sts., Pittsburgh, Pa.: blt. 1865; 1 60-pot, 4 36-pot crucible fur., annual cap., 18,000 tons ingots; 3 B. O. H. fur. (25-ton) annual cap., 45,000 tons ingots; 39 heat. fur. (8 1-d., 13 2-d., 8 3-d., 7 4-d., 2 5-d., 1 6-d.); 11 annealing fur.; 9 hot trains (two 16" 2-h. 3-st.; 18" 3-h. 4-st., 14" 3-h. 5-st., 12" 3-h. 6-st., 12" 3-h. 4-st., 9" 3-h. 5-st., 9" 3-h. 4-st., 8" 3-h. 5-st.); 4 stands cold rolls 10" x 16"; 20 steam hammers. Fuel, coal, coke, nat. and prod. gas. Drill rod shop. Wire factory for

rods for punches, reamers, taps, drills, dental tools, needle wire, and springs. Reduction works for reducing tungsten and vanadium ore, annual cap., 720 tons. Product: hammered and rolled bar steel, spring and tool steel. Annual cap., 63,000 tons ingots, 36,000 tons of rolled and hammered products.

LaBelle Works, Ridge Ave. and Rebecca St., Allegheny, Pa.: blt. 1863; 3 42-pot crucible fur.; 2 A. O. H. fur. (15-ton); 33 forge and heat. fur.; 8 hammers; 8 trains (24", 20", 20", 16", 14", 10", 10", 9"). Fuel, coal and nat. gas. Product: merchant steel, harrow discs, forging and die blocks, alloy steel for automobiles, etc. Annual cap., 8,200 tons crucible, 21,000 tons open hearth ingots; 30,000 tons finished products.

Norwalk Works, Norwalk, Ohio (leased); blt. 1902-3; 2 B. O. H. fur. (20-ton); 8 heat. fur.; 2 annealing fur.; 2 trains (12" 3-h. 5-st. bar mill, 24" single stand sheared plate mill); 5 steam hammers (300-lb. to 6-ton). Fuel, natural gas. Gray iron foundry. Machine shop for own use. Product: hammered and rolled machinery, spring and plow steel, die blocks, discs, carbon and alloy tool steel. Annual cap., 26,000 tons ingots; 21,600 tons rolled and 3,000 tons forged products.

Sanderson Works, Syracuse, N. Y.: blt. 1876; 6 24-pot and 4 12-pot crucible fur.; 18 heat. fur. (5 1-d., 10 2-d., 3 3-d.); 4 trains (12" 3-h. 5-st., 10" 3-h. 7-st., 9" 3-h. 6-st. and 16" jobbing plate mill); 9 hammers (750 to 8,000-lb.). Fuel, bit. coal. Machine shop for own use. Cold drawing dept.: cold drawn needle wire, drill rods and shapes, annual cap., 1,000 tons. Product: crucible steel of all kinds, carbon and alloy tool steel, high speed steel, high speed and carbon drill rods, etc., annual cap., 15,000 tons of ingots and 10,000 tons of rolled and forged products.

Singer-Nimick Works, West Carson St., Pittsburgh, Pa.: blt. 1848; 1 36-pot and 4 24-pot crucible fur.; 24 heat. fur. (20 1-d., 1 2-d., 2 3-d., 1 4-d.); 2 annealing fur.; 2 heat-treating fur.; 8 hot trains (16" 2-h. 3-st. bar, 14" bar with 14" 3-h. 3-st. and 14" 2-h. 1-st., 10" 3-h. 4-st. bar; 18" band with 18" 3-h. 2-st. and 18" 2-h. 2-st., 18" sheet with 18" 3-h. 1-st. and 18" 2-h. 2-st., 20" sheet with 20" 3-h. 2-st. and 20" 2-h. 2-st., 22" 2-h. 4-st. plate, 28" plate with 28" 3-h. 2-st. and 28" 2-h. 1-st.); 2 cold trains (10" 2-h. 4-st., 12" 3-h. 4-st.). Fuel, bit. coal and natural gas. Cold drawing and rolling coulter depts. Product: tool steel, saw plate, agricultural implement steel, rolling coulters, cold drawn die, axle, and shafting steel, cold rolled tool steel and strips. Annual cap., 10,000 tons ingots, 25,000 tons finished products.

Spaulding-Jennings Works, Jersey City, N. J.: blt. 1880, enl. 1900; 6 heat. fur.; 18" mill with 18" 3-h. 1-st. and 18" 2-h. 3-st.; 1 hammer for cogging and welding only. Fuel, coal. Nine 4-pot crucible furnaces dismantled.

Cold rolling dept.: 2 cold mills (one 4-st. and one speed mill 2-st.);

1 Mossberg mach.; 9 pickling tanks. Two wire drawing mills with 9 annealing fur., drawing blocks, etc., pickling and cleaning dept. Plant for tempered and untempered flat wire, equipped with rolling, flattening and polishing machines and tempering and hardening furnaces. Product: bright drawn steel, flat cold rolled steel, drawn wire, flat wire, etc. Annual cap., 2,400 tons hot rolled and 1,000 tons cold rolled products, 5,600 tons wire, 3,000 tons flat wire.

Total annual cap.: 330,200 tons of ingots, (169,500 tons basic, 62,000 tons acid, 91,200 tons crucible, 7,500 tons electric); and 344,600 tons of finished rolled, forged and drawn products.

The Crucible Fuel Co., owns 4,500 acres of coal and about 200 acres of surface on the Monongahela River in Cumberland, Green Co., Pa.

CRUCIBLE STEEL CASTING CO., Cleveland, Ohio.

Org. and inc. 1909. Capital stock: \$25,000.

W. H. Shepard, P.; H. L. Hawgood, V. P.; M. G. Tielke, Sc. & T.; H. L. Aiken, G. M.

Works at 800 Canal Road, Cleveland: blt. 1909; first steel made Dec. 29, 1909; 4 10-pot crucible fur. Adding 1-ton Heroult electric steel fur.; annual cap., 1,200 tons. Fuel, oil and natural gas. Product: crucible steel castings for sale for automobiles and machine tools; chrome, nickel and vanadium alloy steel castings, annual cap., 1,000 tons.

CRUCIBLE STEEL CASTING CO., Lansdowne, Pa.

Inc. Sept. 21, 1892; org. June, 1915. Capital stock: com. auth., \$100,000, issued \$50,000.

C. R. H. Cunningham, P.; H. Bloodsworth, V. P. & T.; H. C. Cunningham, Sc.

Works at Lansdowne: blt. 1905; 4 8-pot crucible fur.; f. o. July 25, 1905. Tropenas converter (2,000-lb.) and 1 cupola added in July, 1915; another Tropenas converter being installed. Fuel, oil. (1 2-ton Roechling-Rodenhauser electric furnace added 1912, dismantled 1913).

Product: crucible and converter steel castings for sale; annual cap., 1,000 tons crucible and 4,000 tons converter castings.

CRUCIBLE STEEL CASTINGS CO., Milwaukee, Wis.

Inc. Sept. 24, 1898.

F. A. Lange, P. & T.

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. Fuel, oil and electricity.

Product: electric steel castings for sale, annual cap., 3,000 tons.

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 : "Eagle".

Works at Curtin: blt. 1809; remodeled 1901; 12 fires and 1 6-ton ham.; water power. Fuel, charcoal.

Product: charcoal blooms and slabs from scrap and pig iron; specialty, blooms for boiler plates, tubes, rivets, and screw rods. Annual cap., 3,000 tons.

Curtis and Co. Manufacturing Co., see St. Louis Steel Foundry Co.

CYCLOPS STEEL WORKS, Titusville, Pa.

Charles Burgess, Proprietor; F. C. Kirkpatrick, Sc. & T.; Walter Bould, M.

Works at Titusville: blt. 1879; rebld. 1884; 2 single puddling, 6 heat. fur. (2 2-d., 4 1-d.); 1 train, 16" 2-h. 2-st. muck bar; 8 double frame ham. (500 to 5,000-lb.); six 6-pot crucible fur. Fuel, nat. gas and coal.

Product: high speed, self-hardening and other special tool steels, alloy crucible steel and extra refined hammered iron. Annual cap., 1,350 tons of hammered iron, 2,660 tons crucible steel ingots.

DAMASCUS CRUCIBLE STEEL CASTING CO., New Brighton, Pa.
(partnership).

Charles Capper, P. & G. M.; C. H. Capper, Sc. & T.

Works at New Brighton: blt. 1900-1; f. o. Feb. 5, 1901; 2 1-d. heat. fur.; 24-pot crucible steel-melting fur.; experimental 250-lb. electric fur. added 1915. Fuel, bituminous coal and mfd. gas. Machine shop for own use. One 3,000-lb. experimental A. O. H. fur. completed 1908, dismantled 1910.

Product: crucible steel castings for sale, annual cap., s. t., 750 tons.

Damascus Tool Steel Co., see 1908 Directory, p. 293. Works at Carnegie, Pa., blt. 1897, sold to Carbon Steel Co., Aug. 1, 1911; destroyed by fire in Dec., 1912.

Daniels, Frank A., New Orleans, La. (Owner).

Star and Crescent Furnace, near Rusk, Texas: 1 stack, 65' x 11', blt. 1890-1, 4 iron stoves. Coke; local ore. Annual cap., 25,000 tons foundry pig iron. *Last active in 1907, abandoned but not dismantled.*

Danville Shovel and Manufacturing Co., formerly owned plant at Danville, Pa., leased to Pennsylvania Brake Beam Co.; now reported by that company as owned by T. J. Price, Trustee.

DANVILLE STRUCTURAL TUBING CO., Danville, Pa.

Org. May, 1902; inc. Nov. 10, 1915. Capital stock: com. auth., \$600,000; issued \$350,000.

Thomas J. Price, P.; Carleton S. Wagner, V. P.; Edward F. Price, V. P.; William G. Pursel, Sc. & T.; Samuel C. Rebman, S. A.

Works at Danville: orig. blt. 1847; 5 2-d. heat. fur.; 3 trains (19" 3-h. 2-st. billet, two 16" 3-h. 3-st. skelp, the latter equipped with 2 patent tube-making machines). Fuel, coal. (The puddling furnaces and 19-inch muck mill formerly connected with these works have been dismantled).

Product: structural tubing (round unwelded tubing from $\frac{3}{4}$ " to $2\frac{3}{4}$ " 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.

Telegraph address, Beaver Falls, Pa. Org. and inc. Jan., 1914. Capital stock: com., \$56,000; pref. 7% cum. auth., \$44,000. issued, \$32,500.

Frank S. Mitchell, Receiver, Patterson Heights, Beaver Falls, Pa.

Works at Darlington: construction of 1 2-ton Tropenas converter commenced Jan. 1, 1914; first steel castings made July, 1914; 1 cupola. Fuel, coal, coke, and nat. gas.

Product; steel castings for sale for light machinery, annual cap., 3,500 tons.

Davidson, Charles, owner, Connellsville, Pa.

Brands: "Sligo," "Tyrone," and "Crown."

Sligo Rolling Mills, Connellsville, Pa.; rebld. and f. o. Sept. 30, 1903; 19 single puddling fur.; 4 4-d. coal heat. fur.; 2 4-d. gas heat. fur.; 1 open annealing fur.; 16" bar mill with 16" 3-h. 1-st. roughing, 16" 3-h. 1-st. and 16" 2-h. 1-st. finishing and 16" 2-h. 1-st. bull-head; 9" guide mill with 12" 3-h. 1-st. roughing, 9" 3-h. 1-st. poney roughing, 9" 3-h. 2-st. strand and planishing, and 9" 2-h. 1-st. bull-head; 20" 3-h. 2-st. muck mill; 2-ball squeezer; 24" plate mill with 2-h. 66" roughing and 3-h. 60" finishing stands; 1 drop steam ham.; 1 shingling ham.; 2 forge fires. Fuel, mfd. gas and coal. Machine shop for own use. (Formerly owned by the Sligo Iron and Steel Co.; bought in by the chief bondholders, Feb. 15, 1915; acquired by Sligo Steel Co. Feb. 1, 1916).

Product: iron and steel plates, and bar iron; annual cap., 30,000 tons.

DAVIDSON MFG. CO., LTD., (The Thomas), 187 Delisle St., Montreal, Canada.

Branch offices: Toronto, Ont., 120 Duke St.; Winnipeg, Man., 25 May St.

Installing a Snyder electric fur. (1-ton) for the manufacture of steel castings for own use and for sale, annual cap., 1,800 tons.

DAVIS BROTHERS ROLLING MILL AND SPIKE WORKS, 29th & Bristol Sts., Philadelphia, Pa.

Org. 1890.

Charles Gibbons Davis, Owner and G. M.

Rolling Mill and Spike Works: blt. 1900; f. o. June, 1900; 14 heat. fur. (11 1-d., 3 2-d.); 3 trains (18" 3-h. 2-st. straight; 10" 3-h. 1-st., 9" 3-h. 2-st. Belgian roughing; 8" 3-h. 1-st. Belgian finishing); 11 spike machines. Fuel, anth. and bit. coal. Machine shop for own use.

Product: merchant bars, spike bars, spikes, iron and steel concrete reinforcing bars, annual cap., 10,000 tons finished products.

DAVISON-NAMACK FOUNDRY CO., Ballston Spa, N. Y.

Org. and inc. 1905. Capital stock: com. auth., \$25,000, issued, \$22,000.

R. H. Davison, P., T., G. M. & P. A.; William H. Namack, V. P. & G. S.; J. D. Namack, Sec.; E. M. Hall, A.

Works at Ballston Spa: blt. 1906; 1 2-ton Tropenas converter in works but not set-up; steel castings are not made. (One 2-ton Tropenas converter formerly in the works, sold to the Darlington Steel Casting Co., Darlington, Pa.) Fuel, coke and oil.

Product: gray iron castings, annual cap., 6,000 tons.

DAYTON COAL AND IRON CO. (The), Dayton, Tenn.

W. B. Allen, Receiver.

Brand: "Dayton".

Dayton Furnaces at Dayton: 2 stacks. No. 1, blt. 1885, last rebt. 1911, 80' x 18' 3"; No. 2, blt. 1885, rebt. 1904, partly dismantled; 75' x 17'; 8 stoves (1 Foote, 7 Whitwell); 7 steam blowing eng.; 40 flue boilers. Coke; local Tennessee and Georgia ores. *Last active in 1913.*

Company owns 357 beehive coke ovens at Dayton.

Product: foundry and forge pig iron, annual cap., 100,000 tons.

DAYTON STEEL FOUNDRY CO. (The), Dayton, Ohio.

Org. 1905; inc. 1909. Capital stock: com. auth. \$50,000, issued \$46,300.

George Walther, P.; G. E. Nicholas, V. P.; W. A. Pierce, Sc., T. & P. A.; Jacob Walther, G. M.

Selling agents: Cincinnati, Ohio, 422 First National Bank Bldg., W. W. Pettis Co.; Detroit, Mich., Chamber of Commerce Bldg., Edward H. Webb.

Works at Dayton: blt. 1905; f. o. Nov., 1905; 5 8-pot crucible fur. (idle); Bretaude steel converter (2-ton); f. o. Aug. 24, 1911, Snyder electric fur. (1-ton) single-phase, A. C.; first electric steel made, Jan., 1916. Fuel, oil and coke.

Product: steel castings for sale; castings for automobiles, trucks, and machinery; also alloy steel castings. Annual cap., 5,000 tons converter, 2,500 tons electric castings.

DeBats Crucible Steel Co., Zelienople, Pa., see 1912 Supplement, p. 27, crucible steel casting plant at Zelienople abandoned and crucible furnaces dismantled; company out of business.

DEEMER STEEL CASTING CO., New Castle, Delaware.

Inc. Aug. 5, 1907. Capital stock: com. auth., \$250,000, issued, \$223,000.

Selden S. Deemer, P. & G. M.; Walter G. Parsons, Sc.; Ezekiel Cooper, T.

Works at New Castle: blt. 1909; 2 Deemer steel converters (3-ton); 2 cupolas; first steel made Jan. 17, 1910. Fuel, coal, coke and oil.

Product: railroad and machinery steel castings for sale, annual cap., 3,000 tons.

DEFOREST SHEET AND TINPLATE CO. (The), Niles, Ohio.

Org. and inc. 1909. Capital stock: com. auth. \$600,000, issued \$596,800; bonds \$200,000.

Wade A. Taylor, P. & T.; Charles S. Thomas, V. P. & Sc.; A. M. Spahn, A.; Charles W. Martin, G. S.; E. H. Fisher, P. A.

Selling agents:

Chicago, First Nat. Bank Bldg., W. H. Meyst.

Dallas, Texas, Manufacturers Sales Co.

Louisville, Ky., W. P. Davis.

New York, 30 Church St., M. L. Filley.

Philadelphia, 220 E. Mt. Pleasant Ave., George G. Falconer.

Pittsburgh, Park Bldg., E. V. Porter.

St. Louis, Chemical Bldg., Beckwith Bros.

Brand: "Deforest".

Works at Niles: blt. 1909, f. o. Nov. 1, 1909; 1 jobbing mill, 30" x 60", blt. and f. o. 1914; 2 pair and 1 sheet coal heat. fur.; 1 open annealing fur., sheets 8 to 16 gauge, to 50" wide; 9 black sheet mills; 9 pair and 9 sheet fur.; sheets 14 to 34 gauge, to 48" wide; 5 single-stand cold mills (1 60", 4 46"); annealing fur.; 6 pickling machines; 1 pickling tank for bars; 6 galvanizing pots (5 spelter, 1 lead), weekly cap., 1,000 tons. Fuel, coal. Terne plate dept. added 1911, first terne plates made July 8, 1912; 1 long terne pot. Fuel oil. Dept. for the manufacture of metal roofings, sidings, ceilings, etc., and a dept. for pressed steel parts of all kinds. Product: steel sheets, black plates for tinning, metal roofings, sidings, ceiling and other sheet metal materials, also pressed steel parts of all kinds, annual cap., 50,000 tons. Long terne plates, lead coated sheets, annual cap., 10,000 tons.

DELAWARE AND HUDSON CO. (The), Albany, N. Y.

L. F. Loree, P.; at 32 Nassau St., New York City. C. S. Sims, V. P. & G. M.; at Albany, N. Y.

Works at Colonie: post office and telegraph address, Watervliet, N. Y.; blt. 1911-12; 1 2-ton Whiting converter and 1 cupola installed 1912; first steel made Dec. 1, 1912. Fuel, coke and oil.

Product: steel castings for own use, annual cap., 450 tons. Also makes gray iron castings, annual cap., 2,000 tons; and brass castings, annual cap., 140 net tons.

Delaware and Hudson Co. (The), Albany, N. Y., owns Standish Furnace at Standish, N. Y.; leased to the Northern Iron Co.

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., Thurlow Station, below Chester, Pa.

Org. and inc. Nov. 17, 1909. Capital stock: com. auth., \$500,000, issued, \$452,700, bonds, \$59,000.

Charles Hart, P.; R. H. McCurdy, Sc. & T.; at Chester. M. A. Wick, V. P.; at Elyria, Ohio.

Delaware Furnace, Thurlow: 1 stack, 70' x 17'; f. o. Nov., 1881; rebt. 1892; 4 stoves (1 McClure, 20' x 80', and 3 Foote, 16' 6" x 65');

2 steam blowing eng. (30,000 cfm.); 6 water-tube and 2 tubular boilers, 2,000 H. P. By-product coke; foreign and domestic ore. Connected with the furnaces are 40 Semet-Solvay by-product coke ovens, annual cap., 95,000 net tons; also 1 slag gran. pit with an annual cap. of 36,000 tons. (Formerly called Tidewater Furnace and operated by Tidewater Steel Co.; acquired by Delaware River Steel Co., Nov. 9, 1909).

Product: Bessemer, basic, malleable, and foundry pig iron; annual cap., 70,000 tons.

DELAWARE SEAMLESS TUBE CO., Auburn, Pa.

Inc. Jan. 15, 1903. Capital stock: \$150,000. H. T. Wallace, P.; at Wilmington, Del. John R. Morrison, Sc.; Daniel J. Driscoll, T.; at Auburn.

Selling agent: New York, 2 Rector St., L. D. Rockwell.

Brand: "Delaware".

Works at Auburn: Rolling mill added 1897; rebld. 1902; f. o. Jan. 1, 1903; 2 3-d. coal-fired heat. fur.; 2 trains (10" 3-h. 2-st., 14" 2-h. 2-st.); 2 steam ham. (150, 250-lb.). Fuel, anth. and bit. coal. Machine shop for own use.

Product: hollow seamless billets, boiler tubes, hollow staybolt stock, and mechanical seamless tubing rolled from solid purchased billets. Annual cap., 6,000 tons of hollow billets and 5,000 tons of boiler tubes.

DELAWARE STEEL AND ORDANCE CO., 30 Pine St., New York, N. Y.

Capital stock: \$10,000,000.

Temple Furnace at Temple, Pa.: 1 stack, rebld. 1875; 3 McClure 3-pass stoves, 70' x 18'; 2 Weimer steam blowing eng. (18,000 cfm.); boiler plant, 1,500 H. P. Anthracite and coke; Lake, local hematite and N. J. magnetite ore. (Formerly owned by Temple Iron Co.; acquired by present owners, Nov. 20, 1915.)

Product: foundry and forge pig iron, annual cap., 50,000 tons.

Old Ferry Mill, Wilmington, Del.: bld. 1868, rebld. 1891: 4 B. O. H. fur. (50-ton); 1 A. O. H. fur. (50-ton) bld. 1899-00; first steel made Aug. 23, 1900; 6 single and 6 double puddling fur.; 12 heating fur. (3 2-d., 9 3-d.); 6 trains (34" blooming mill; 18" 3-h. 3-st. muck, 10" bar with 15" 3-h. 2-st. and 10" 3-h. 5-st., 9" bar with 14" 3-h. 2-st. and 9" 3-h. 5-st., 9" 3-h. 4-st. bar, 8" 3-h. 4-st. bar). Machine shop and gray iron foundry. Annual cap., 150,000 tons ingots, 60,000 tons merchant bars. (Formerly owned by Diamond State Steel Co.; acquired by D. J. Driscoll, Feb. 10, 1914; acquired by present owners in 1915).

Dempsey (M. J.), 40th St. & 11th Ave., New York, N. Y.

William S. Dempsey, S.

Standard Rolling Mill: bld. 1891; 2 coal heat. fur. (3-d.), 2 trains (18" 3-h. 2-st., 10" 3-h. 4-st. bar). Fuel, coal. *Idle*.

Product: merchant bars, angles, and horseshoe iron, annual cap., 6,000 tons.

DE SOTO FOUNDRY AND MACHINE CO., Ltd., Mansfield, La.

Org. and inc., 1906. Capital stock: \$75,000.

Charles R. Law, P. & G. M.; B. Johnson, V. P.; W. H. Perkins, Sc., T. & A.

Works at Mansfield, La.: blt. 1906; 1 Tropenas converter (2,000-lb.) added 1910; f. o. Sept. 1, 1910; 1 1,500-lb. ham. Fuel, natural gas and electricity. Machine shop for jobbing and own use. Gray iron foundry.

Product: steel castings for sale, for gears, saw-mill machinery, etc., from 1 to 5,000 lbs.; gray iron castings and heavy forgings. Annual cap., 350 tons of steel and 500 tons gray iron castings, 50 tons forgings.

DETROIT FURNACE CO., foot of Meldrum Ave., Detroit, Mich.

Inc. April 13, 1906. Capital stock: com. \$120,000; pref. 8% cum., \$30,000.

J. C. Clutts, P.; at Wellston, Ohio. J. K. Pollock, V. P.; at Cincinnati. C. F. Fraser, Sc. & T.; at Detroit.

Selling agents: Rogers Brown & Co.

Brand: "Detroit."

Furnace at Detroit: 1 stack, 62' x 12½'; blt. 1870; rebt. 1902-03; remod. 1906; first coke pig iron made Aug. 22, 1906; three iron stoves; 1 steam blowing eng. (9,900 cfm.); 5 tubular boilers, 750 H. P. Coke: Lake ore.

Product: foundry, malleable Bessemer, basic, and car-wheel pig iron, annual cap., 30,000 tons.

DETROIT IRON AND STEEL CO., Detroit, Mich.

Org. and inc., April, 1902. Capital stock: com., \$750,000; pref. 7% cum. \$750,000; bonds, \$440,000.

D. R. Hanna, P.; F. B. Richards, V. P.; R. L. Ireland, V. P.; M. McMurray, Sc. & T.; C. F. Cadden, P. A.; at Leader News Bldg., Cleveland, Ohio. W. S. Withycombe, A. Sc. & A. T.; P. J. Moran, G. S.; at Detroit.

Sales agents: M. A. Hanna & Co.

Brand: "Zug."

Furnaces on Zug Island, River Rouge, Wayne County: 2 thin-lined stacks; Furnace A, 78' x 19'; blt. 1903; f. o. Feb. 15, 1904; rebt. thin-lined 1911. Furnace B, 80' x 19': construction commenced May, 1909; blown in July 20, 1910; rebt. thin-lined 1914; 8 2-pass stoves, 83' x 20'; 5 steam blowing eng. (85,725 cfm.); 14 water-tube boilers, 4,612 H. P.; double-strand Uehling casting machine; Greenawalt sintering plant (35-ton pan); annual cap., 12,000 tons. By-product coke; Lake ore.

Product: foundry, Bessemer, basic, and malleable pig iron. Annual cap., from 220,000 to 240,000 tons.

DETROIT SEAMLESS STEEL TUBES CO., 841 West Jefferson Ave., Detroit, Mich.

Org. and inc. 1900. Capital stock: com. auth., \$300,000; issued, \$197,500.

A. A. Templeton, P.; Daniel Wells, V. P. & T.; R. H. Phillips, Sc.; S. C. Cameron, A.; C. L. Stafford, S.; C. C. Rosser, S. M.
Selling agents: Boston, Mass., Fargo and Egmont Sts., Brown, Wales & Co.; Chicago, Ill., N. Branch St., A. M. Castle & Co.; New York City, 260 West St., Dilworth, Lockwood & Co.; St. Louis, Mo., Handlan & Buck.

Brand: "Detroit."

Works at 841 West Jefferson Ave.: blt. 1900; f. o. Jan. 1, 1901; 3 heat. fur. (2 2-d. to heat steel for piercing, 1 2-d. for small billets for rolling); 4 annealing fur., 1 heat-treating fur.; 2 pointing, 3 upsetting, 1 piercing machine; 3 trains, 2-h. 1-st.; 6 ham. (50-lb. and 100-lb. Bradley, 400-lb. steam, 3 K. J. pointing). Fuel, coal, coke and oil. Machine shop for own use. Developing new tube rolling mill.

Product: rolled blanks for own use; cold-drawn seamless marine, locomotive, arch pipes, stay tubes, safe ends, and other boiler tubes, automobile tubes, mechanical tubes, upset, swelled and swaged tubes; annual capacity, 15,000 tons of blanks and 10,000 tons of tubes.

DETROIT STEEL CASTING CO. (The), Detroit, Mich.

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.; Phelps Newberry, T.; J. P. Warren, A. T.

Sales offices: Chicago, Ill., 1818 McCormick Bldg., R. P. Dyer; Minneapolis, Minn., H. V. Fleck & Co., (agents); New York City, 30 Church St., J. P. Ryan.

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.; 1-ton side-blown converter added 1913; f. o. Jan. 5, 1914. Fuel, coke, prod. gas and oil. (2 Robert Bessemer converters (1½-ton); dismantled 1913.)

Product: steel castings for sale, for cars, locomotives, engines, heavy machinery, automobiles, trucks, etc., annual cap., 1,200 tons converter, 9,600 tons open hearth steel castings.

Diamond State Steel Works, formerly operated by Diamond State Steel Co. and for many years held by trustees for the creditors, were sold at public auction Feb. 10, 1914, to Daniel J. Driscoll; Diamond State Steel Mill, blt. 1853, dismantled in 1913 and machinery stored, but not set up in old Ferry Mill; acquired by Delaware Steel and Ordnance Co. in 1915.

DIBERT, BANCROFT AND ROSS, Tulane and Hagan Aves., New Orleans, La.

(Formerly known as Bancroft, Ross and Sinclair Co., Ltd.)

E. J. Ross, P.; M. Walker, V. P.; W. M. Bancroft, Sc. & T.
 Works at St. Joseph and Tchoupitoulas Sts., New Orleans: 1 Tro-
 penas converter (2-ton); f. o. Aug., 1907. Fuel, coke.
 Product: steel castings for sale, chiefly for saw-mill and sugar
 machinery, annual cap., 700 tons.

Dillon-Griswold Wire Co., Sterling, Ill., see 1908 Directory, p. 385.
 Reorganized in Oct., 1908, as The Griswold Co. Wire rod mill,
 idle since 1901, was dismantled in 1909. Wire plant sold to North-
 western Barb Wire Co. in April, 1914.

**DILWORTH, PORTER & CO., Ltd., 4th and Bingham Sts., Pitts-
 burgh, Pa.**

Org. and inc. Jan. 3, 1900. Capital stock: \$2,000,000.

J. R. Dilworth, Ch.; W. F. Schleiter, Sc. & G. S. M.; F. C.
 Stoeltzing, T.; J. C. Dilworth, G. M.; C. T. Dabney, Jr., G. S.;
 J. D. Beggs, P. A.

Selling agents:

Atlanta, Healy Bldg., V. A. Moore & Co.

Boston, John Hancock Bldg., F. C. Stowell.

Chicago, Rookery Bldg., C. Stein.

Louisville, American Nat'l Bank Bldg., T. C. Coleman & Son.

New York, 260 West St., Dilworth, Lockwood & Co.

Philadelphia, Franklin Bank Bldg., Maurice Joy & Co.

Pittsburgh, William Goldie (Representative).

Richmond, Mutual Bldg., J. S. Hoffecker.

St. Louis, Commonwealth Trust Bldg., Jos. G. Miller.

St. Paul, Endicott Bldg., H. C. McNair Co.

Brands: "Dilworth, Porter & Co." for spikes; "Glendon Flange,"
 "Goldie Claw," for tie plates.

Glendon Rolling Mill, Pittsburgh: blt. 1857; rebt. after fire 1902;
 37 heat. fur. (16 2-d., 3 4-d., 18 cont.); 5 trains (two 10" 2-h. 7-st.
 cont., 10" 2-h. 9-st. cont., 18" 3-h. 3-st. bar, 18" 3-h. 2-st. bar);
 3-ton steam ham.; 20 automatic, 16 hand spike mach. Fuel,
 nat. gas and coal. Machine shop for own use.

Product: steel railroad, street railway and boat spikes; tie plates;
 floor plates, chill and mill castings, etc. Annual cap., 54,000 tons
 spikes, 50,000 tons tie plates; 500 tons floor plates, etc.

DISSTON (HENRY) & SONS, Inc., Tacony, Philadelphia, Pa.

(Address P. O. Box 1537, Philadelphia). Org. 1840; inc. Dec.,
 1886. Capital stock: \$3,500,000.

Frank Disston, P.; Henry Disston, Edmond B. Roberts, William
 D. Disston, V. P.; Hamilton Disston, Sc. & T.; S. Horace
 Disston, A. T.

Sales offices: Boston, Mass.; Chicago, Ill.; Cincinnati, Ohio; Mem-
 phis, Tenn.; New Orleans, La.; New York City; Portland, Ore.;
 San Francisco, Cal.; Seattle, Wash.; Sydney, Australia; 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 and Sons File Co. See below.

Henry Disston and Sons File Co., Tacony, Philadelphia, Pa. (Address P. O. Box 1537, Philadelphia). Org. 1877; inc. July 1, 1903. Capital stock: \$500,000.

Frank Disston, P.; Henry Disston, Edmond B. Roberts, William D. Disston, V. P.; Hamilton Disston, Sc. & T.; S. Horace Disston, A. T.

Selling agent: Henry Disston and Sons, Inc.

Works at Tacony, Philadelphia: manufactures files of all shapes, sizes and kinds of cuts.

Henry Disston and Sons Iron and Steel Works, Tacony, Philadelphia, Pa. (Address P. O. Box 1537, Philadelphia). Org. 1854; inc. Dec. 1886. Capital stock: \$1,500,000.

Frank Disston, P.; Henry Disston, Edmond B. Roberts, William D. Disston, V. P.; Hamilton Disston, Sc. & T.; S. Horace Disston, A. T.

Selling agents: Henry Disston & Sons, Inc. See above.

Brands: "Disston," and "Keystone."

Keystone Saw, Tool, Steel and File Works, Tacony, Philadelphia: manufacture of saws started 1840, and steel 1854; 7 crucible fur. (3 24-pot, 3 30-pot, and 1 36-pot); rolling mill added 1866; 2 coal-fired cont. heat. fur.; 9 trains hot rolls (18" 3-h. 4-st. bar, 12" 3-h. 6-st. bar, 9" 3-h. 7-st. guide, 9" 3-h. 5-st. guide, 1 28", 1 20", 1 18", and 2 16" plate mills); 9 trains single-stand cold rolls (2 20", 3 10", 4 8"); 4 drawing blocks for fine wire; 1 gas and 26 coal heating and annealing fur.; 4 oil annealing, hardening, and tempering fur.; 5 ham. (750 to 4,500-lb.). Fuel, coal and mfd. gas. (1 10-ton B. O. H. fur. blt. 1900, dismantled 1906; experimental electric fur. added, 1906; dismantled, 1909.)

Product: high carbon sheets for saws, engravers' plates, bar tool steel, cold rolled bands, flat wire and special steel. Annual cap., 13,000 tons of crucible steel ingots; 20,000 tons of bars, bands, and rods; and 7,000 tons of sheet steel and saw plate.

Doble (Abner) Co., see 1908 Directory, p. 406. Open-hearth furnaces partly erected in 1906, abandoned in 1907.

DOMINION IRON AND STEEL CO., Ltd., Sydney, Nova Scotia, Canada.

Org. and inc. 1899. Capital stock: com. auth. \$25,000,000, issued \$20,800,000; pref. 7% cum., auth. and issued \$5,000,000; bonds \$14,510,173 mortgage; \$3,500,000 income.

Mark Workman, P.; at 112 St. James St., Montreal. William McMaster, V. P.; at Montreal. C. S. Cameron, Sc., T., & C.; C. S. Martin, G. S.; J. P. McNaughton, G. S. M.; H. J. McCann, P. A.; at Sydney.

Sales offices: Montreal, 112 St. James St.; Toronto, 18 Wellington St., E.; London, England, Westinghouse Bldg., 2 Norfolk St., Strand. Brands: "Disc," "Dominion."

Works at Sydney, Nova Scotia: Blast Furnaces: 6 stacks, 85' x 20'; construction commenced 1899; No. 1, f. o. Feb. 4, 1901; 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, 85' x 21'; 7 steam blowing eng. (5 vertical cross-compound steam and 2 mixed pressure steam turbo blowers, 245,000 cfm.); 44 water-tube boilers, 13,976 H. P.; 1 double Heyl and Patterson casting machine. By-product coke: Wabana ore. Molten metal to mixers. Product: basic and foundry pig iron, annual cap., 550,000 tons.

Rolling Mills, orig. blt. 1900-01; 5 4-hole soaking pits; 1 cont. ingot heat. fur.; 10 B. O. H. fur. (50-ton); f. o. Dec. 31, 1901; 3 (1 for spare) basic Bessemer converters (15-ton) added 1907; f. o. May, 1907; used only for desiliconizing, dephosphorizing and decarburizing molten metal for O. H. fur.; 3 mixers (1 300-ton and 2 350-ton); 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; Morgan semi-cont. bar and rod mill with 12" 2-h. 6-st. roughing and 3 trains of 2-st. each 10½" and 9½" finishing, first rods rolled, May, 1904; first bars Mar., 1913; 28" rail mill consisting of 3-h. roughing, 3-h. intermediate and 2-h. finishing st., first rails rolled, July, 1905; 16" merchant, with 3-h. roughing, 3-h. intermediate, and 2-h. finishing, first bars rolled Sept., 1915. Gray iron foundry, annual cap., 5,000 tons; brass foundry and machine shop for own use. Fuel, prod. gas and bit. coal. Product: open-hearth steel ingots, blooms, billets, slabs, steel rails, bars, angles, channels, I beams, flats, squares, rounds, angle bars, and wire rods. Annual cap., 400,000 tons ingots, 375,000 tons blooms, billets, slabs, 300,000 tons of rails, 90,000 tons wire rods, 75,000 tons bars.

Wire and Nail Department: added 1911-12, f. o. May, 1912; 3 double frames 24"-26" diam. blocks each, 1 single frame 11"-26" diam.; 1 single frame 24"-16" and 20" diam.; 4 single frames 12"-8" blocks each; 92 nail machines, assorted sizes and types; 2 staple machines, 1 wire straightening and cutting machine; barbed wire fence 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 gauge, galvanized, black or pot annealed; barbed wire fence; staples,

black or galvanized; straightened wire; bale ties, wire hoops, etc. Annual cap., 50,000 tons drawn wire, 30,000 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 620 Otto-Hoffman by-product ovens with an annual cap. of 650,000 net tons of coke. 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, carbolic acid and pitch.

Plant operated by the Sydney Cement Co., Ltd., for the manufacture of cement from blast furnace slag.

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.

DOMINION STEEL FOUNDRY CO., Ltd., Hamilton, Ont., Canada. Org. and inc. April, 1913. (Formerly known as Dominion Steel Castings Co., corporate title changed Nov. 1, 1913). Capital stock: com. \$1,000,000, pref. 7% cum. auth. \$1,000,000, issued \$658,000.

C. W. Sherman, P. & G. M.; J. E. Hammond, Sc.; F. A. Sherman, A. Works M.; A. G. Wright, P. A.; at Hamilton, Ontario. F. W. Baillie, V. P.; at Toronto, Ontario.

Selling agents: Toronto, Allen General Supplies, 205 Yonge St.; Winnipeg, Man., C. E. Chown, 425 Henry Ave.

Works at Depew St., Hamilton: blt. 1912, 2-ton Stock oil-fired converter; 3 A. O. H. fur., (one 25-ton, two 20-ton); first converter steel made Feb. 15, 1913; first O. H. steel made Nov. 19, 1912. Fuel, oil.

Product: steel castings for sale. Annual cap., 2,000 tons converter castings, 15,000 tons open hearth castings.

Donner, Percy E., see 1908 Directory, p. 301, projected steel works near Pittsburgh, abandoned in 1909.

DONNER STEEL CO., Inc., Morris Bldg., Philadelphia, Pa.

Org. and inc. Dec. 8, 1915. Capital stock: \$5,000,000.

W. H. Donner, P.; R. N. Donner, V. P. & G. S. M.; T. H. Craig, T.; F. D. Hoerle, A. G. M. S.; at Philadelphia. F. C. Slee, Sc.; J. K. Frye, P. A.; at Buffalo.

Works at Abbott Road, Buffalo:

Nellie B. Furnace: 1 stack: 85' x 21'; construction commenced Nov., 1906; completed and blown in July 14, 1909; 4 McClure hot-blast stoves, 105' x 21'; 3 steam blowing eng. (45,000 cfm.)

Coke; Lake ore. Molten metal to O. H. fur. Product: basic pig iron, annual cap., 150,000 tons.

Steel Works: blt. 1905-07; 3 B. O. H. fur. (2 200-ton Talbot, 1 65-ton stationary; first O. H. steel made April 18, 1907; 3 4-hole soaking pits; 19 gas prod.; 2 cupolas; 36" 2-h. 1-st. blooming mill, first products rolled, April 18, 1907. Fuel, prod. gas. Molten metal from blast fur. used in O. H. fur. Machine shop for own use. (Formerly owned by New York State Steel Co., acquired by present owners Dec. 3, 1915.

Product: ingots, billets, blooms and slabs. Annual cap., 160,000 tons of ingots, 100,000 to 120,000 tons of rolled products.

Douglassville Iron Co., Ltd. (The), Douglassville, Pa., see 1908 Directory, p. 267. Rolling mill at Douglassville dismantled in 1914.

Dover Forge and Iron Co., see 1908 Directory, pp. 369, 371. Forge and rolling mill at Canal Dover acquired by the Reeves Manufacturing Co., April 1, 1911.

DOVER IRON CO., Carlisle, Tenn.

Org. and inc., 1901. Capital stock: \$40,000.

Graham Macfarlane, P. & T.; John C. Ralls, G. M. & P. A.; at *Carlisle. R. B. Hickman, Sc.; at Louisville, Ky.

Selling agents: Hickman, Williams & Co.

Brand: "Dover."

Dover Furnace at Carlisle: 1 stack, blt. 1828, last rebt. 1903-4; 36' 6" x 9' 6"; cold blast; 1 steam blowing eng.; 3 cylindrical boilers. Charcoal; local ore.

Company owns iron ore mines 5 miles from furnace and mines all ore used; also limestone quarry at the furnace. Burns own charcoal in open pits.

Product: cold blast charcoal pig iron for chilled rolls, annual cap., 5,000 tons.

Bear Spring Furnace, Bear Spring, Tenn.: blt. 1832, abandoned 1907, dismantled.

Drew Steel Foundry, Lockport, N. Y., see 1908 Directory, p. 244; crucible steel furnaces dismantled in 1912.

DROLET (F. X.) CO., Quebec, P. Q., Canada.

F. X. Drolet, P. & G. M.; G. Drolet, V. P.; J. H. Hamel, Sc.; Arthur Drolet, T.

Works at Quebec: 1 1½-ton acid Baillot converter. Fuel, coke and fuel oil. Machine shop for jobbing and own use.

Product: steel castings for sale from 1-lb. to 10-ton, also gray iron and brass castings. Annual cap., 2,000 tons steel, 1,800 tons iron and 100 tons brass castings.

Dunbar Furnace Co., see 1908 Directory, p. 309. Blast furnaces at Dunbar, Pa., sold to American Manganese Manufacturing Co., July 1, 1914.

Duncannon Iron Co. (The), see 1908 Directory, p. 276, formerly owned rolling mill known as Duncannon Iron Works at Duncannon, Pa.; went into the hands of receivers, Aug., 1908; purchased at receivers sale, March 17, 1910, by H. H. Light; Duncannon Iron & Steel Co. incorporated in Oct., 1910, to take over the property; capital stock of Duncannon Iron and Steel Co. purchased by Lebanon Valley Iron and Steel Co., Oct. 4, 1911.

Duplex Metals Co., Chester, Pa.

Frank R. Chambers, P.; Frank R. Chambers, Jr., V. P. & T.; Charles Halsey, Sc.

Works at Chester: blt. 1871, reblt. 1911-12; 2 tilting fur., 6 crucible fur. for melting copper; 10 oil heat. fur.; 6 soaking pits; 3 billet and rod heat. fur.; 1 sheet bar, 2 sheet reheate. fur.; 1 sheet and 1 wire annealing fur.; 5 hot trains (23" 2-st., 23" slab, 12" 4-st., 10" 5-st., 22" x 60" sheet mill); 2 cold mills (24" x 60" sheet, 12" x 20" strip); 11 wire drawing blocks; 6 wire nail machines. Formerly made copper-clad rods, sheets, strips, wire and nails. Works idle since 1913; company out of business.

DUQUESNE STEEL FOUNDRY CO. (The), 1104 Arrótt Bldg., Pittsburgh, Pa.

Inc. Dec. 13, 1899. Capital stock: com. auth., \$1,200,000, issued \$750,000.

W. A. Herron, P.; T. H. Bakewell, V. P. & T.; L. W. Frank, Sc. Works at Kendall Station, P. & L. E. R. R. (post-office and telegraph address, Coraopolis, Pa.): 3 A. O. H. fur. (two 25-ton; one 10-ton). Fuel, nat. gas. Machine shop for own use. (14" train and heat. fur. added 1905, dismantled 1910; 2 Tropenas converters (2-ton) blt. 1906-7, dismantled, 1913).

Product: steel castings for sale, for locomotives and cars, rolling mills (inc. rolls), electric motors, etc. Annual cap., s. t., 18,000 tons.

Durham Iron Co., Riegelsville, Pa., see 1908 Directory, p. 260. Durham Furnace at Riegelsville sold under foreclosure proceedings and bid in by Wm. J. Fling, acting as trustee for the bondholders. Purchased from the bondholders committee by J. H. McClure & Son, of Philadelphia, Nov. 24, 1911, and dismantled in 1912.

Dutcher Co. (The), see 1908 Directory, p. 396, assigned for the benefit of its creditors in May, 1908; later in same month the steel casting plant in Milwaukee was taken over by the Dutcher Steel Casting Co.; the property was sold Nov., 1909, to the Prime Steel Co.

Dutcher Steel Casting Co., see Dutcher Co. and the Prime Steel Co.

EAGAN-ROGERS STEEL AND IRON CO., Crum Lynne, Pa.

Org. and inc. Feb. 26, 1912. Capital stock: \$100,000.

Daniel C. Egan, P. & G. M.; Michael A. Casey, Sc. & P. A.; J. I. Rogers, T. & G. S. M.; at Crum Lynne. John J. Buckley, V. P.; at Chester, Pa.

Works at Crum Lynne: construction commenced April 4, 1912; completed and put in operation July 29, 1912; 2-ton Stoughton converter; first steel made July 29, 1912. Fuel, coke and oil. Contemplates adding an electric steel furnace.

Product: light weight steel castings 1 to 4,000 lb. for sale, for battle-ships, submarines, etc., locomotives, and automobile trucks; alloy steel castings. Annual cap., 2,500 tons.

Eagle Casting Co., Winchester, Ky., see 1910 Supplement, p. 22, 1912, Supplement, p. 37; works at Winchester built 1907; converter and crucible steel furnaces added in 1908; steel castings last made in 1910; converter and crucible furnaces dismantled.

Eagle Crucible Steel, Brass and Iron Foundry, see 1910 Supplement, p. 17, crucible steel casting plant dismantled about Jan. 1, 1910.

EAGLE FURNACE CO., Chattanooga, Tenn.

Inc. Dec., 1909.

Charles A. Lyerly, P. & T.; W. S. Shelow, V. P. & G. M.; 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. (Formerly owned and operated by the Eagle Iron Co.; acquired by present owners Dec. 30, 1909). *Last active in 1911.*

Product: car-wheel charcoal pig iron, annual cap., 12,000 tons.

Eagle Horse Shoe Co., see 1908 Directory, p. 397. Company failed in Jan., 1906. Property held by Fidelity Trust Co. of Milwaukee as trustee for the bondholders until sold to the Racine Iron and Metal Co., May 18, 1910.

Eagle Iron Co., Chattanooga, Tenn., see 1908 Directory, p. 349, formerly owned and operated Attalla Furnace at Attalla, Ala. Property sold to T. S. Kyle, agent, in 1908. First National Bank of Chattanooga, acquired the property about May 1, 1909. Acquired by the Eagle Furnace Co., Dec. 30, 1909.

EAGLE IRON CO., lessee, Curtin, Pa.

Org. and inc. 1899.

J. M. Curtin, P.; at Pittsburgh. H. Laird Curtin, V. P. & S.; John Curtin, T.; at Curtin, Pa.

Selling agents: Rogers, Brown & Co.

Eagle Furnace, 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 mine near Bellefonte, annual cap., 2,000 tons. (Owned by H. L. Curtin).

Product: charcoal pig iron for rolls and dies, annual cap., 2,400 tons.

EAST JORDAN FURNACE CO., East Jordan, Mich.

Org. Nov. 23, 1909; inc. Nov. 24, 1909. Capital stock: com., \$225,000; pref. cum., \$150,000. (Formerly East Jordan Iron Co., inc., Dec. 5, 1907, reincorporated under name of East Jordan Furnace Co. as above).

C. H. Schaffer, P.; at Marquette. Frank B. Baird, V. P.; at Buffalo. Fred Smith, Sc.; at Elk Rapids. D. A. Crawford, A. Sc.; at Chicago. W. J. Ellson, T. & G. M.; at East Jordan.

Selling agents: Pickands, Brown & Co., Chicago.

Furnace at East Jordan: 1 stack; 60' x 10', blt. 1907-09, using part of the machinery from Principio Furnace, Principio, Md.; first blown in 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.

East Jordan Iron Co., reincorporated under the name of East Jordan Furnace Co., Nov. 23, 1909.

EASTERN STEEL CO. (The), Pottsville, Pa.

Org. and inc. Jan. 8, 1903. Capital stock: com. auth., \$4,700,000, issued \$3,650,000; pref. cum. auth., \$4,700,000, issued, \$2,200,000. Veryl Preston, P.; August Heckscher, V. P.; Malcolm D. Sloane, Sc.; at 60 Broadway, New York. James A. Burden, V. P.; at Troy, N. Y. Edward L. Herndon, T.; E. L. Hitchcock, A.; William M. Mehlhorn, V. P.; P. R. Foley, G. S. M.; at Pottsville, Pa.

Sales offices:

Boston, 110 State St.

Chattanooga, 328 Carter St., John C. Vance Iron & Steel Co. (agent).

Chicago, 1300 N. Branch St., A. M. Castle & Co. (agent).

Cincinnati, Citizens Bank Bldg., Union Iron & Steel Co. (agent).

Cleveland, Rockefeller Bldg., J. F. Corlett & Co. (agent).

Los Angeles, Citizens National Bank Bldg., A. M. Castle & Co. (agent).

New York, 60 Broadway.

Philadelphia, Pennsylvania Bldg.

San Francisco, Monadnock Bldg., A. M. Castle & Co. (agent).

St. Louis, Mo., Chemical Bldg., J. B. Sharp (agent).

Brand: "Warwick."

Product: foundry, forge, basic, Bessemer, and low-phosphorus pig iron; ingots, blooms, billets, beams, channels, and angles; structural bolts and rivets.

On Feb. 2, 1912, The Eastern Steel Co. leased the plants and properties of the Warwick Iron and Steel Co. for 99 years. Under the terms of the lease The Eastern Steel Co. may purchase the property at any time within 15 years. The plants taken over under the lease consist of 3 blast furnaces owned by the Warwick Iron and Steel Co. and known as Warwick Furnaces.

Warwick Furnaces, Pottstown (leased): 3 stacks: Nos. 1, 2, and A. No. 1, 70' x 16'; blt. 1875; f. o. April, 1876; enl. 1889; No. 2, 100' x 22'; blt. 1900-1; f. o. Oct. 8, 1901; 4 Cowper-Roberts 3-pass stoves, 100' x 21'; A furnace, 85' x 20' (thin-lined); blt. 1910; f. o. May 19, 1912; 4 Roberts 3-pass stoves (3 80' x 20' and 1 70' x 20'). Blowing capacity for two stacks only, one stack operated as an alternate. 4 steam blowing eng. (90,000 cfm.); 16 water-tube boilers, 4,716 H. P.; 1 single and 1 double-strand Uehling casting machines; Gayley dry-air plant; Dwight & Lloyd sintering plant for flue dust, ore and pyrites cinder; annual cap., 40,000 tons. Coke: New Jersey and New York magnetites, Lake Superior and foreign ore. Iron foundry and machine shop for own use. (Owned by Warwick Iron and Steel Co.)

Product: foundry, forge, basic, 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. (4 50-ton, 2 80-ton). Rolling mill, blt. 1852; rebt. 1877; again rebt. 1902; 4 1-hole soaking pits; 2 6-d. gas-fired and 3 cont. heat. fur.; 4 trains (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 and coal. Machine shop for own use. Bridge works; annual cap., 15,000 tons. Dept. for structural bolts and rivets 1/2" to 1" dia. Product and annual capacity: ingots (240,000 tons), blooms and billets (125,000 tons), structural shapes (180,000 to 200,000 tons), bolts (6,260 kegs), rivets (2,966 kegs).

EASTERN STEEL CASTING CO., 30 Kemble St., Boston, Mass.

Org., Aug., 1905.

John W. Johnson, Prop. & M.

Works at Boston: blt. 1905; 2 8-pot Hunter crucible fur.; first crucible steel made, Dec. 1, 1905. Fuel, crude petroleum.

Product: crucible steel castings for sale; also alloy steel castings; annual cap., 600 tons.

ECKELS-NYE STEEL CO., Emerson Ave. & Chemung St., Syracuse, N. Y.

Org. and inc. Mar. 30, 1899. Capital stock: \$60,000.

Peter Eckel, P.; Philip Eckel, V. P. & G. S.; Frank M. Sears, Sc., G. S. M. & P. A.; Frank Eckel, T.

Works at Syracuse: blt. and f. o. 1899; 2 4-d. Sweet heat. fur.; 13'' 3-h. 4-st. rail splitting and rerolling mill. Fuel, bituminous coal.

Product: Bessemer and high-carbon merchant steel, annual cap., s. t., 12,000 tons.

Eclipse Rolling Mill, Birmingham, Ala., see Southern Iron and Commission Co.

Edgar Allen American Manganese Steel Co., name changed to American Manganese Steel Co., April 15, 1915.

EDGAR ZINC CO., Boatmen's Bank Bldg., St. Louis, Mo.

Subsidiary of the United States Steel Corporation.

S. C. Edgar, Jr., P.; A. S. McMillan, V. P. & T.; John Davis, Sc. & A.

The company operates two zinc plants with a total annual cap. of 31,000 net tons of spelter.

Carondelet Works, St. Louis, Mo.: 2,000 retorts, annual cap., 8,500 net tons.

Cherryvale Works, Cherryvale, Kansas: 4,800 retorts, annual cap., 22,500 net tons.

The company controls 10,012 acres of natural gas lands in Kansas with 180 gas wells.

Edgewater Iron Co. purchased Lebanon Valley Furnace and one 96th share in Cornwall Ore Banks in July, 1908. In Nov., 1910, the property of the Edgewater Iron Co. was sold under foreclosure proceedings to J. M. Shenk and George E. Meily, representing the bondholders. The Lebanon Blast Furnace Co. was organized to take over the property and operate the blast furnace.

EDWARDS (E. T.), Columbia, Pa. (lessee).

Brands: "Columbia," "East End," and "Susquehanna."

Product: skelp and tube iron, merchant bar iron and steel, and muck bars; also wrought iron pipe.

E. T. Edwards is lessee of the following mills at Columbia, Pa., all owned by the Susquehanna Iron Co.

Columbia Mill, Columbia, Pa.: blt. 1854; remod. and enl. 1885, 14 double puddling fur., 6 2-d. heat. fur.; 4 trains (two 18'' 3-h. 1-st. puddle, 18'' 3-h. 3-st., 10'' 3-h. 5-st. skelp). Fuel, bit. coal.

Product: grooved skelp and tube iron, annual cap., 20,000 tons.
East End Mill, Columbia, Pa.: blt. 1893-4, f. o. Sept., 1894; 3 2-d. heat. fur.; 2 trains (18'' 2-h. 2-st. billet, 12'' 2-h. 4-st. bar). Fuel, bit. coal. Product: merchant bar iron and steel, annual cap., 8,000 tons.

Susquehanna Mill, Columbia, Pa.: blt. 1860; rebt. 1895 after fire; 14 single and 9 double puddling fur.; 18" 3-h. 2-st. muck train. Fuel, bit. coal. Product: muck bars, annual cap., 20,000 tons.

Susquehanna Tube Mill, Columbia, Pa.: blt. 1903; f. o. July 23, 1903. Product: wrought iron pipe; sizes: lap weld, from 2" to 10"; butt weld, from 1/2" to 2"; annual cap., 70,000 tons.

Eisen-Steel Manufacturing Co., see 1908 Directory, p. 258, formerly owned Philadelphia Steel and Iron Works, Frankford, Phila., Pa. Steel furnaces dismantled in 1909 and plant sold.

Eleanor Iron Co. (The), see 1908 Directory, p. 288, formerly owned Juniata Rolling Mill at Hollidaysburg, Pa. Plant sold Sept. 2, 1913, to Williams & Fiedman, Altoona, and dismantled in 1913-14.

Electric Steel Co., see 1912 Supplement, p. 22, built plant at New Milford, Conn., in 1910, equipped with crucible furnaces, hammers and cold rolls. Crucible furnaces and hammers dismantled in 1913. Plant leased to The Cold Rolled Steel Co.

ELECTRIC STEEL CO., 3100 South Wood St., Chicago, Ill.

Org. Nov. 20; inc. Nov. 23, 1915. Capital stock: com. \$60,000. Charles Piez, P.; John M. Olmsted, V. P., G. M. & G. S. M.; P. L. Coonley, Sec. & T.; M. S. Vincent, G. S.

Works at 3100 South Wood St.; building one 1 1/2-ton Snyder electric fur. to be completed about Mar. 1, 1916. Product: electric steel castings and alloy steels for sale, annual cap., 3,000 tons.

ELECTRIC STEEL CO. OF INDIANA, Indianapolis, Ind.

Inc. Oct., 1913. Capital stock: \$100,000.

H. McK. Landon, P.; P. J. McNamara, V. P.; M. P. Emmerich, Sec.; J. M. Ryan, T. & G. M.

Works at Indianapolis: one basic-lined Heroult electric fur. (3-ton), blt. 1914-15, f. o. May, 1915; charge cold metal.

Product: electric steel castings for sale for gears, machinery, etc., annual cap., 3,600 tons.

ELECTRIC STEEL & METALS CO., Ltd. (The), Welland, Ont., Canada.

Org. Aug. 21, 1913; inc. May 20, 1913. Capital stock: com. \$225,000; pref. 7% cum. \$275,000.

R. Turnbull, P.; E. Carnegie, V. P., T. & G. M.

Branch office: 7 Victoria Street, Westminster, S. W., London, England.

Works at Welland, Ontario: blt. 1913-14; 1 5-ton Heroult electric fur., first steel made Dec. 1, 1914. Fuel, electricity, coal and gas. (Installing second Heroult electric fur. (6-ton) to be completed in March, 1916; may install hot trains of rolls and manufacture bar steel for rifles, rock drills, boring machines, etc., and ingots for forging shops, tool steel makers, etc.)

Product: steel ingots, manganese and other alloy steel ingots, annual cap. 4,000 tons, to be increased to 8,000 tons.

ELECTRIC STEEL CASTINGS CO. (The), Milwaukee, Wis.

Org. Dec. 9; inc. Dec. 14, 1915. Capital stock: com. \$150,000; pref. 7% non cum. \$150,000.

Leo G. Smith, P. & G. M.; C. W. Yockey, V. P.; F. G. Wetter, Sc. & P. A.; C. F. Taylor, T.

To build works at Milwaukee to contain 1 electric fur. (type not yet determined) for manufacture of steel castings for sale, annual cap. to be about 7,500 tons.

ELECTRIC STEEL FOUNDRY, Main office, foot of East Salmon St., Portland, Oregon.

Org. and inc., Sept., 1913. Capital stock: com. auth., \$50,000, issued, \$36,000.

Leonard Schad, P.; C. F. Swigert, V. P. & T.; George F. Schott, Sc.; C. W. Schad, S.

Works at 24th and York St., Portland; blt. 1907; 1 Girod electric fur. (1-ton), construction commenced June, 1913; completed and put in operation Mar. 5, 1914. Fuel, electricity, fuel oil, and wood. (1 10-pot crucible steel melting fur. blt. 1907, abandoned March, 1914). (Formerly operated by the Portland Bronze and Crucible Steel Foundry; acquired by the Electric Steel Foundry, Sept. 1, 1913.)

Product: steel castings for sale, annual cap., 300 tons. Also makes brass and aluminum castings.

ELECTRO METALLURGICAL CO., Forty-Second St. Bldg., New York, N. Y.

George O. Knapp, P.; E. F. Price, V. P. & G. M.; F. E. Lawton, T.; at New York. E. S. Whitney, Sc.; at First National Bank Bldg., Chicago, Ill.

The Electro Metallurgical Co. owns and operates the Kanawha Works, Glen Ferris, West Va., and the Niagara Works, Niagara Falls, N. Y.; it also operates the Virginia Works, Holcomb Rock, Va., under lease from the Virginia Electrolytic Co., owner.

These 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. & 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., Curry Bldg., Pittsburgh, Pa.

Chas. R. Bryson, P. & G. M.; R. O. Ebbert, Sc. & T.

Trade mark: Gysinge "Electro Steel."

Works at Pittsburgh: blt. 1904, f. o. 1904: Kjellen electric fur.

Product: ingots, castings, and high speed steel; annual cap., 1,500 tons.

ELLA FURNACE CO. (The), Western Reserve Bldg., Cleveland, Ohio.
Org. and inc. March 26, 1912. Capital stock: \$200,000.

H. G. Dalton, P.; G. H. Beaumont, V. P. & G. M.; S. E. Bool, Sc. & A. T.; E. P. Williams, T.; H. S. Pickands, P. A.; at Cleveland. F. Ward Coburn, G. S.; at West Middlesex, Pa.

Selling agents: Pickands, Mather & Co., Cleveland.

Brand: "Ella."

Ella Furnace, at West Middlesex, Pa.: 1 stack, 70' x 15' 6", blt. and blown in, 1882; last remod. 1909; 4 Wheeler pipe hot-blast stoves; 3 steam-blowing eng. (35,000 cfm.); 6 water-tube boilers, 2,300 H. P.; slag gran. pit, annual cap., 46,500 tons. Coke; Lake ore. Machine shop for own use.

Product: Bessemer, basic, foundry, and malleable pig iron, annual cap., 80,000 tons.

Elmira Heights Rolling Mill Co., see Elmira Rolling Mill Co.

Elmira Rolling Mill Co., see 1908 Directory, p. 245. Elmira Rolling Mill, Elmira Heights, N. Y., sold at sheriff's sale in April, 1909, to M. H. Arnot who formed the Chemung Rolling Mill Co. to take over the property. Leased to the Elmira Heights Rolling Mill Co. in Oct., 1908, and leased to Gustave Benjamin, Aug. 2, 1909. Property acquired by Arnot estate and rolling mill dismantled in 1913-14 by N. D. Doxey, of Elmira, agent for the Trustees.

EL PASO FOUNDRY AND MACHINE CO., El Paso, Texas.

Org. and inc. 1890. Capital stock: com. auth., \$300,000, issued, \$288,000; bonds, \$75,000.

W. N. Small, P. & G. M.; J. J. Ormsbee, Acting Sc. & T.

Works at El Paso: 2 side-blown converters (3-ton), 1 cupola; blt. 1907; first steel castings made Oct. 23, 1907. Fuel, coke and oil. Machine shop for jobbing and own use.

Product: steel castings for sale for railroad work and mining machinery, annual cap., 500 tons. Also makes gray iron castings; annual cap., 1,248 tons.

ELYRIA IRON AND STEEL CO. (The), 232 East 131st, St., Cleveland, Ohio.

Hugh B. Wick, P.; Myron A. Wick, V. P. & T.; J. L. Barnard, Sc. & A. T.

Sales offices:

Atlanta, Candler Bldg.

Chicago, Peoples Gas Bldg.

Chicago, Great Northern Bldg.

San Francisco, Monadnock Bldg.

Works at Elyria, Ohio: blt. 1902-3; f. o. in fall of 1903; 2 cont. coal-fired heat. fur.; 4 trains (20" 2-h. 1-st.; two Belgian 16" 3-h. 3-st.; Belgian 10" 3-h. 3-st.); 2 railroad spike machines. Fuel, coal and oil. Machine shop for own use. Galvanizing department for electro-galvanizing pipe.

Product: railroad tie plates, railroad spikes, high-carbon steel tubing for bedsteads, structural and agricultural implement purposes, and agricultural implement shapes rolled from purchased steel billets and old steel rails, annual cap., 50,000 tons.

Works at 232 East 131st. St., Cleveland: blt. 1915. Product: oxy-acetylene welded, light gauge steel tubing and tubular parts.

EMBREE IRON CO., 332 South Michigan Ave., Chicago.

Org. and inc. April 14, 1903. Capital stock: com., \$300,000; bonds, \$40,000.

F. S. Wheeler, P.; 447 West 14th St., New York. C. P. Wheeler, V. P.; R. S. Dutton, Sc. & T.; 332 South Michigan Ave., Chicago. John F. Cregan, G. S.; at Embreeville, Tenn.

Brand: "Embreeville."

Embreeville Furnace at Embreeville, Tenn.; telegraph address, Johnson City: 1 stack, 80' x 17½', blt. 1891 and blown in 1892: rebt. 1903; 3 Cowper-Kennedy stoves, 75' x 20'. Coke from Big Stone Gap, Va.; local brown hematite ore. *Last active in 1909.*

Product: malleable, foundry, forge, low-phosphorus, and high-manganese pig iron, annual cap., 50,000 tons.

Emery Steel Co., see 1908 Directory, p. 352, leased for a short time the plant of the Weller Rolling Mill and Forge Co., at Gadsden, Ala.

Empire Foundry and Machine Works, 9th & Hyatt Sts., Chester, Pa.

Works at Chester: blt. 1908; 1 crucible fur. (12-pot); blt. 1914; first steel made Nov., 1914. Fuel, oil. Machine shop for jobbing. (Adding another 12-pot crucible fur.) Acquired at sheriff's sale by John J. Buckby and Thomas P. Dwyer. Product: steel castings for sale for machine parts; also alloy steel castings. Makes gray iron castings. Annual cap., 350 tons steel, 1,000 tons gray iron castings.

Empire Iron and Steel Co., Niles, Ohio, acquired by The Brier Hill Steel Co., Feb. 1, 1912.

EMPIRE ROLLING MILL CO. (The), Cleveland, Ohio.

Org. and inc. 1899. Capital stock: com. auth., \$400,000, issued, \$300,000.

C. G. Barkwill, P.; A. W. Ellenberger, V. P.; D. R. James, Sc. & T.; J. D. Paton, G. S.

Works at Cleveland: blt. 1900; f. o. Dec. 15, 1900; 4 single puddling fur.; 6 busheling fur.; 2 forge fires; 2 4-d. gas, 2 4-d. coal heat. fur.; 3 trains (12" 3-h. 1-st. roughing, 10" 3-h. 4-st. Belgian; 16" 3-h. 4-st. bar). Fuel, prod. gas. Adding six black sheet mills

(5 38", 1 44"); 4 cold mills, 48"; 2 4-pot annealing fur.; 1 pickling mach.; 1 galv. pot; annual cap., 30,000 tons black sheets.
Product: iron and steel bars, annual cap., 40,000 tons.

EMPIRE STEEL AND IRON CO., Catasauqua, Pa.

Inc. Mar. 13, 1899, org. Mar. 14, 1899. Capital stock: com., \$1,254,770; pref. cum. 6%, \$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 L. P.," "Crane Basic," "Macungie," "Oxford," "Topton."

Product: foundry, forge, basic, Bessemer, and low-phosphorus 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, 80' x 17½', blt. 1850, last rebt. 1907; 3 Cowper stoves; 7 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.) No. 3 Furnace, 75¾' x 17', dismantled 1913.

Product: foundry, basic, Bessemer and low-phosphorus pig iron, annual cap., 140,000 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. *Last active in 1913.*

Product: Bessemer, 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; 4 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., 80,000 tons.

Topton Furnace, Topton, Pa.: 1 stack, 70' x 16', blt. 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., 36,000 tons.

Henry Clay Furnaces, Reading, Pa.: 2 stacks, 57' x 13'. *Dismantled in 1913.*

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 360,000 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, 4.05 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 bee-hive coke ovens at Caperton, W. Va. Annual capacity of the mines 120,000 tons of coal and 35,000 net tons of coke.

EMPORIUM IRON CO., lessee, Emporium, Pa.

Org. and inc. Aug., 1913. Capital stock: com. auth., \$100,000; issued, \$92,500.

A. Brady, P. & G. M.; C. J. Goodnough, Sc., T. & G. S.

Sales agents: New York City, 30 E. 42d St., Crocker Bros.

Brand: "Emporium."

Emporium Furnace: 1 stack, 75' x 16', blt. 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 bee-hive coke ovens, annual cap., 40,000 net tons. (Owned by Sinnemahoning Iron and Coal Co.)

Product: foundry, forge, and high-silicon pig iron, annual cap., 45,000 tons.

ENTERPRISE FOUNDRY CO., 2902 19th St., San Francisco, Cal.

H. Martens, P.; Charles J. P. Hoehm, V. P.; J. W. Heaney, Sc.; H. J. F. Niemann, G. M.

Works at South San Francisco: blt. 1909; first steel made June 2, 1909; 2 8-pot crucible fur. Fuel, oil. Machine shop for jobbing. (Formerly owned and operated by the Western Steel Company; acquired by present owners, March 1, 1912.)

Product: crucible steel machinery castings for sale, annual cap., 150 tons. Gray iron castings, annual cap., 3,500 tons, and semi-steel castings, 50 tons.

ERIE FORGE CO., Erie, Pa.

Org. and inc. 1903. Capital stock: auth., \$1,000,000; issued, \$600,000; bonds, \$600,000.

R. F. Devine, P. & G. M.; A. C. Grove, V. P.; H. C. McLaughlin, Sc.; G. W. J. Stout, T. & G. S.; J. L. Whalen, G. S. M.; K. E. Blair, P. A.

Works at Erie, Pa.: blt. and f. o. 1873; first steel made May 17, 1909; 1 A. O. H. fur. (35-ton); 1 B. O. H. fur. (50-ton); 7 steam hammers (500-lb. to 12-ton); 2 forging presses (1,000-ton, 1,500-ton); 2 machine shops. 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., 17,000 tons acid, 25,000 tons basic ingots.

Eureka Steel Co., Pittsburgh, Pa., see 1912 supplement, p. 28.

Plant sold in 1912 and crucible steel furnace dismantled.

EVANSVILLE TOOL WORKS, Evansville, Ind.

Org. and inc. Nov. 6, 1897. Capital stock: com., \$100,000.

Frank Lohoff, P. & G. M.; Samuel L. Orr, V. P.; J. M. Stricker, Sc. & T.

Works at Evansville: blt. 1887 and first steel made Oct., 1887; 4 4-pot crucible fur.; 12 trip ham.; 10 forging presses. Fuel, coke. Machine shop for own use.

Product: steel castings from 1 to 500 pounds for gear blanks, crankshafts, etc., for the use of the company and for sale. Annual cap., s. t., 150 tons. Make forged steel hatchets, hammers, sledges, etc.

EWALD IRON CO. of Delaware, Louisville, Ky.

Org. 1880; inc. June, 1915. Capital stock: com. \$1,000,000; pref. 7% cum. \$400,000.

Baylor Hickman, P. & G. M.; G. O. Boomer, Sc. & T.

Brands: "Tennessee Charcoal Bloom," "Laurel," "E. I. C."

Works at Louisville: rolling mill blt. 1869; 12 single puddling fur.; 5 2-d. heat. fur.; 4 trains (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. Machine shop for own use. Charcoal forge: 8 knobbling, 8 forge, and 8 run-out fires; 2 ham. (8-ton, 10-ton); steam power. Fuel, charcoal. (Formerly owned and operated by the Ewald Iron Co. of Kentucky, acquired by present owners in June, 1915.)

Product: bar and guide iron; annual cap., single turn, 9,000 tons; charcoal blooms, billets, and hammered bars for sale; annual cap., 5,000 tons.

(Tennessee Rolling Works, at Tennessee Rolling Works, Lyon County, Ky., dismantled in 1911.)

FAIR (S.) AND SON, INC., Saginaw, Mich.

Org. 1887; inc. Dec., 1909. Capital stock: \$75,000.

Samuel Fair, P. & G. M.; Louis G. Fair, V. P.; Mae M. Fair, Sc. & T. Works at 514 North Hamilton St., Saginaw, W. S.; blt. 1909; 5 6-pot crucible fur., f. o. March, 1909; 1 Snyder electric fur. (1,500-lb.) added 1915, f. o. Sept. 10, 1915; cold metal charged. Fuel, oil.

Product: carbon and alloy crucible and electric steel castings for sale; vanadium steel castings for automobiles, etc.; annual cap., 1,200 tons crucible, 2,400 tons electric.

Fairmont Rail Co., see Fairmont Steel Co., and United States Iron and Steel Co. of Texas.

Fairmont Steel Co., Fairmont, W. Va., see 1908 Directory, p. 331, suspended operations Sept., 1907. Works acquired by the Fairmont Rail Co., Inc., Aug. 15, 1909; sold in August, 1910, to the United States Iron and Steel Co. of Texas and dismantled in 1911.

FALK CO. (The), Milwaukee, Wis.

Org. and inc. May, 1895. Capital stock: com., \$1,000,000; pref. 6%, \$250,000.

Herman W. Falk, P.; Otto H. Falk, 1 V. P.; Clarence R. Falk, 2 V. P.; E. A. Wurster, Sc. & T.; Harold S. Falk, G. S.

Sales agents:

New York, 50 Church St., M. P. Fillingham.

Pittsburgh, Park Bldg., Walter O. Beyer.

San Francisco, Rialto Bldg., F. W. Grimwood.

Works at foot of 30th St., Milwaukee: blt. 1900, enl. 1905; first O. H. steel made April 7, 1900; first converter steel made Mar. 17, 1910; 3 Wellman-Seaver A. O. H. fur. (15, 18, and 20-ton); 3-ton Stoughton converter added 1910. Fuel, oil.

Product: steel castings for sale and own use. Annual cap., 25,000 tons open hearth and 4,000 tons converter steel castings.

FALLS HOLLOW STAYBOLT CO., Cuyahoga Falls, Ohio.

C. M. Walsh, (sole owner) P. & G. M.; H. I. Dyke, P. A.

Selling agents:

Chicago, 343 S. Dearborn St., John E. Chisholm.

Chicago, 55 N. Jefferson St., A. M. Castle & Co.

New Orleans, 523 Carondelet St., P. F. Flavin.

Salt Lake City, 32 Main St., John Hickey.

San Francisco, 1045 17th St., Berger & Carter Co.

Seattle, 580 First Ave. South, Western Hardware & Metal Co.

Brands: "Falls Hollow Staybolt Iron," "Falls Solid Staybolt Iron," and "Falls Hollow Staybolt Steel."

Works at 21 E. Portage St., Cuyahoga Falls: blt. 1865; rebt. 1884, remod. 1903; 2 4-d. heat. fur.; 2 trains (22" 2-h. 1-st. Belgian, 10" 3-h. 6-st. finishing). Fuel, oil.

Product: hollow and solid staybolt bars made from best quality double refined charcoal iron or steel, annual cap., 2,000 tons.

Fannin & McCullough Sheet Mill Co. leased the Ashland Sheet Mill, Ashland, Ky., Nov. 30, 1912; lease given up in 1915; company out of business.

FARIST STEEL CO. (The), Bridgeport, Conn.

J. Windsor Farist, P.; George Windsor, Sc. & T.

Brand: "The Farist Steel Co."

Works at Bridgeport: blt. 1868; enl. since; 6 heat. fur.; 4 trains (10", 12", 15" and 16", all 3-h.); 6 ham.; 1 Siemens gas crucible steel-melting fur. (24-pot). Fuel, prod. gas and coal. Spring shop for the manufacture of spiral springs and elliptic railroad springs added 1883, enl. 1900 and 1902.

Product: rolled and hammered crucible steel; also rerolls and hammers O. H. and Bessemer steel. Annual cap., s.t., 1,800 tons of crucible ingots, 9,000 tons of rolled, and 1,000 tons of forged products.

FARRELL-CHEEK STEEL FOUNDRY CO., Sandusky, Ohio.

Org. May, 1910. Capital stock: \$50,000.

Herbert Farrell, P., G. M., & P. A.; J. E. Sweet, Sc. & G. S.; R. C. Farrell, T.; H. B. Castleman, A.; O. O. Brace, G. S. M.; at Sandusky, Ohio. J. O. Cheek, V. P.; at Nashville, Tenn.

Works at Sandusky, Ohio: blt. 1910; f. o. Oct. 17, 1910; 2 Bretaud converters (1-ton) and 1 cupola. Fuel, coke and nat. gas.

Product: steel castings for sale for automobiles, machine tools, traction engines and annealing boxes; also alloy steel castings. Annual cap., 4,000 tons.

Fawcus Machine Co., see Fischer Foundry and Machine Co.

Federal Furnace Co., Chicago; formerly operated 2 coke stacks at South Chicago, absorbed by the By-Products Coke Corp., December 2, 1915.

Federal Rolling Mill Co., formerly leased the Elmira Rolling Mill, Elmira, N. Y., 1908 Directory, p. 245, see Elmira Rolling Mill Co.

FEDERAL STEEL FOUNDRY CO., foot of Reaney St., Chester, Pa.

(Owned by Wm. Cramp & Sons Ship & Eng. Bldg. Co., acquired March 1, 1910.) Org. and inc. June 1, 1906. Capital stock: com. \$250,000; pref. auth. \$250,000, issued \$212,000; bonds \$34,000.

Henry S. Grove, P.; Harry W. Hand, V. P.; Charles T. Taylor, Sc. & T.; George D. Martin, A. & C.; at Beach and Ball Sts.,

Philadelphia, Pa. Frank Overn, G. M.; Thomas Mitchell, G. S.; F. C. Hamilton, P. A.; at foot of Reaney St., Chester, Pa.

Selling agents: New York, 100 Broadway, Carroll S. Smith; Norfolk, Va., Eagleston-Parke Co.; San Francisco, Monadnock Bldg., James C. H. Ferguson.

Works at Chester, Pa.: blt. 1903-4; 2 B. O. H. (30-ton, 35-ton); annealing fur.; first steel made June 27, 1904. Fuel, oil. Low phosphorus and low sulphur melting stock (7-ton A. O. H. fur. dismantled).

Product: steel castings for sale for machinery, engines, electrical work, locomotives, ships, etc., from 50 to 50,000 lbs.; annual cap., 12,000 tons.

FERGUSON TIN PLATE CO., Torrens St. & P. R. R. (P. O. Box 973), Pittsburgh, Pa.

Org. July, 1895; inc. Aug. 4, 1902.

F. H. Speer, P.; J. McD. Ferguson, Sc.; A. C. Ferguson, T.

Works at Pittsburgh, Pa.: blt. 1895; first terne plates made July, 1895; first tinplates made Sept., 1895; 2 pots for terne plates, weekly cap., 800 boxes of 14" x 20" terne plates. Fuel, nat. gas. Now redip terne plates only for own jobbing business.

Firth (Rowland) and Son Co., Inc., Phillipsburg, N. J., succeeded Rowland Firth and Son, April 11, 1912. Added 10-ton basic open-hearth furnace to their works in 1911, first steel made Jan. 27, 1912. Plant bid in at sheriff's sale March 7, 1912, by the bondholders. *Idle and for sale or lease.* Address Nicholas Gibney, Trustees for Bondholders. Product: steel castings for sale, annual cap., 3,000 tons.

FIRTH-STERLING STEEL CO., McKeesport, Pa.

Org. and inc. July 11, 1889. Capital stock: com., \$1,000,000; pref. 7% cum. \$500,000.

Lewis J. Firth, P.; Eben B. Clarke, V. P. & G. M.; James E. Porter, Sc.; D. E. Jackman, T.; A. Fielder Clarke, G. S.; P. B. Blood, P. A.

Sales agents:

Cambridge, Mass., 128 Sidney St., Wheelock, Lovejoy & Co.

Chicago, 710-14 West Lake St., E. S. Jackman & Co.

Cleveland, 333 Frankfort Ave., E. S. Jackman & Co.

Detroit, 35 Bates St., E. S. Jackman & Co.

New York, 23 Cliff St., Wheelock, Lovejoy & Co.

Philadelphia, 15 North Seventh St., MacFarland & Little.

Pittsburgh, 1422 Oliver Bldg., E. S. Jackman & Co.

San Francisco, 16th & Connecticut Sts., E. S. Jackman & Co.

Brand: "Firth-Sterling."

Demmler Works, Demmler Station, McKeesport, Pa.: est. 1875; first crucible steel, 1875; 4 crucible fur. (1 12-pot and 3 30-pot);

3-ton basic Heroult electric fur.; 5-ton B. O. H. fur.; 21 heat. fur. (14 2-d., 5 3-d., 2 4-d. Swindell coal-fired); 4 trains (16" 3-h. 5-st., 12" 3-h. 5-st., 10" 3-h. 7-st., 8" 3-h. 5-st. bar); 11 steam ham. (1,000 to 12,000-lb. and 3 tilt). Fuel, bituminous coal and natural gas. Machine shop for own use.

Product: fine crucible and special steels, alloy steel ingots. Annual cap., 7,000 tons of crucible, 3,500 tons O. H. and 1,700 tons of electric steel ingots.

Fischer Foundry and Machine Co., see 1908 Directory, p. 313. The Real Estate Trust Co. of Pittsburgh sold the property to George L. Fischer, subject to a mortgage of \$150,000. This mortgage was foreclosed and the property sold at public auction, Dec. 13, 1909, to A. Greenbaum. The plant was purchased Jan. 5, 1910, by the Fawcus Machine Co. and used as a gray iron foundry only. The open-hearth furnaces have been dismantled; Bessemer converter still in the works but abandoned.

Flagg & Co. (Stanley G.), Morris Bldg., Philadelphia, Pa.

Pottstown Works, Stowe, (Pottstown), Pa.: blt. 1895; 5 cupolas, 11 annealing fur.; 1 A. O. H. fur. (16-ton) added 1899. Fuel, prod. gas. One air furnace (25-ton.)

Product: gray iron and malleable iron castings and pipe fittings, annual cap., 10,000 tons.

FLICKWIR, DAVID W. (owner), 202 First National Bank Bldg., Roanoke, Va.

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., owned by company. Machine shop for own use. (Formerly owned and operated by West End Furnace Co.; acquired by present owner Nov. 28, 1914.) *Last active in 1912.*

Product: basic, forge and foundry pig iron. Annual cap., 48,000 tons.

FOLLANSBEE BROTHERS CO., Liberty and Short 2nd and 3rd Aves., Pittsburgh, Pa.

B. G. Follansbee, P.; William U. Follansbee, Sc. & T.; John Follansbee, S. M.

Works at Follansbee, West Va.: blt. 1902-04, first products rolled Sept. 6, 1904; 3 B. O. H. fur. (40-ton) added 1905, f. o. Dec. 10, 1906; 1 8-ton ham.; 4 4-d. reheat. fur.; 30" 2-h. 1-st. reversing bar mill; 7 black sheet mills, (2 28" x 38", 3 30" x 44", 1 30" x 38", 1 30" x 48"); 8 cold mills, 6 single-stand and 1 with 2-st. tandem (5 28" x 50", 3 24" x 50"); 6 black plate mills, (3 28" x 36", 3 28" x 32"); 6 42" cold mills; 19 pair and sheet gas heat. fur.;

17 box annealing fur. (11 gas and 6 coal); 2 Gray hand pickling tanks; 3 galvanizing pots. Machine shop for own use.

Tin and terne plate department: blt. 1903-04; 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 coal.

Product: ingots, sheet and tinplate bars, black and galvanized sheets, black plate for tinning, blued products, enameling and nickeling stock, and tin and terne plates. Annual cap., 90,000 tons ingots, 80,000 tons sheet and tinplate bars, 60,000 tons sheets and black plates; 252,000 boxes tinplates; 221,250 boxes terne plates.

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 offices:

Baltimore, Md., Continental Bldg.; Chicago, Ill., Fisher Bldg.; New York, N. Y., 170 Broadway.

Works at Butler, Pa.; blt. 1909-10; 6 B. O. H. fur. (60-ton); 34" slabbing mill; first steel made Oct. 12, 1910, first slabs rolled Oct. 12, 1910; 18" and 12" mills; plate mill. Fuel, natural and producer gas. Machine shop for own use.

Product and annual cap.: ingots, 220,000 tons; slabs, 165,000 tons; shapes, 100,000 tons; and universal and sheared plates; all for own use. Forged steel car wheels.

FORT PITT MALLEABLE IRON CO., Thompson Ave., McKees Rocks, Pa.

Org. and inc. Oct. 15, 1901. Capital stock: auth., \$750,000, issued, \$300,000.

Frank J. Lanahan, P. & G. M.; J. S. Lanahan, V. P. & G. S. M.; William A. Heyl, Sc.; R. J. Davidson, T.; P. J. Meehan, A.; George Booker, G. S.; A. M. Fulton, A. G. S.; T. J. O'Brien, P. A.

Works at McKees Rocks (P. O. address, Box 1054, Pittsburgh, Pa.): blt. 1901; 5 A. O. H. fur. (4 15-ton; 1 25-ton); 17 annealing fur. Fuel, nat. gas.

Product: malleable castings, annual cap., 25,000 tons.

FORT PITT STEEL CASTING CO., McKeesport, Pa.

Org. Dec. 21, 1905; inc. Nov. 1, 1906. Capital stock: com., \$15,000.

C. S. Koch, P. & G. M.; Albert Curry, V. P.; H. J. Koch, Sc. & G. S. M.; William L. Curry, T.; H. H. Nicholson, A. & P. A.

Works at McKeesport: blt. 1905-06; first steel made June 15, 1906; 2-ton Stoughton converter; 2 cupolas. Fuel, nat. gas.

Product: steel castings for sale; rolling mill, electric and car castings, etc.; annual cap., 3,600 tons.

FORT SMITH IRON AND STEEL MILLS, Fort Smith, Arkansas.

Org. and inc. Dec. 15, 1915. Capital stock: com. \$25,000.

J. W. Arnold, P.; R. W. Cotton, V. P., Sc. & P. A.; J. E. Arnold, T.
Works at Arkoma, Oklahoma: blt. 1913 with machinery from plant
of Kenton Iron & Steel Co., So. Charleston, W. Va.; f. o. Jan.,
1914; 1 4-d. scrap heat. fur.; 10" 3-h. 4-st. merchant mill. Fuel,
oil. Machine shop for own use. (Formerly operated by Fort
Smith Iron and Steel Co.; works sold Jan. 26, 1915, to L. Feen-
berg; acquired by present owners in 1915).

Product: merchant bars, annual cap., 3,000 tons.

Fort Wayne Rolling Mill Co., reorganized Jan. 1, 1915, under the name
of The Fort Wayne Rolling Mill Corporation.

FORT WAYNE ROLLING MILL CORPN. (The), Fort Wayne, Ind.

Org. Jan. 1, 1915, inc. Jan. 5, 1915. Capital stock: com. auth.,
\$100,000, issued \$50,000; pref. 7% cum. auth., \$100,000, issued,
\$50,000; bonds, \$100,000.

E. F. Yarnell, P.; H. C. Rockhill, V. P., T., G. M., & G. S. M.;
Ira W. Langford, Sc. & A.

Selling agents: Chicago, Great Northern Bldg., P. H. Joyce; St.
Louis, 815 Spruce St., Louis Keller; St. Paul, Lumber Exchange
Bldg., H. V. Fleck & Co.

Brand: "Wayne Special."

Works at Fort Wayne: blt. 1903; f. o. Dec. 23, 1903; 3 double
puddling fur., 5 single busheling fur., 1 3-d. gas pile fur.; 4 4-d.
gas heat. fur.; 1 hand-fired heat fur.; 4 trains (20" 3-h. muck,
18" 3-h. bar, 9" 3-h. guide, and 8" 3-h. guide). Fuel, prod.
gas and pulverized coal. Machine shop for own use. (Formerly
operated by the Fort Wayne Rolling Mill Co.; acquired by present
company, Jan. 1, 1915.)

Product: merchant bars, bands, etc., annual cap., 55,000 tons.

Fort Worth Iron and Steel Co., Fort Worth, Texas, reorganized July
30, 1908, under the name of the Texas Rolling Mill Co.

Fox, B. Frank (owner), Hackettstown, N. J.

Hackettstown Furnace, at Hackettstown: 1 stack: blt. 1874-5,
reblt. 1899: 60' x 15': Kent stoves. O. H. fur., idle. *Last active
in 1902; for sale.* (Formerly owned by Carteret Steel Co.;
acquired by B. Frank Fox, July, 1913.)

Franklin Iron Manufacturing Co., see 1908 Directory, p. 239. Blast
furnace known as Franklin Furnace at Franklin Springs, N. Y.,
dismantled in 1913.

Franklin Rolling Mill and Foundry Co. (The), see 1908 Directory,
p. 313. The plant at Franklin, Pa., was sold at receiver's sale
Feb. 15, 1909, and purchased by the Franklin Steel Co. Name of
Franklin Steel Co. changed to Franklin Steel Works, June 15, 1912.

Franklin Steel Co., see Franklin Steel Works.

FRANKLIN STEEL WORKS, 612 Atlantic Ave., Franklin, Pa.

Edward E. Hughes, G. M. ; C. F. Mackey, A. G. M. (Owned by the Chicago Railway Equipment Co., of which Edward B. Leigh is P. ; E. T. Walker, Sc. & T.)

Selling agents :

Boston, 12 Pearl St., P. C. Rogers.

Chattanooga, John C. Vance Iron & Steel Co.

Cleveland, 1320 Rockefeller Bldg., J. F. Corlett & Co.

Denver, McPhee Bldg., Northwestern Supply Co.

Minneapolis, Phoenix Bldg., R. A. Lundquist.

New Orleans, 207 Queen & Crescent Bldg., John C. Brill.

New York, 30 Church St., Wonham, Sanger & Bates, Inc.

Philadelphia, Real Estate Trust Bldg., Lewis N. Lukens.

Works at Franklin : orig. blt. 1902-03 ; f. o. Aug., 1903 ; rebt. after fire, 1914 ; 3 heat. fur. (1 4-d. 2 cont.) ; 3 trains (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 ; also machine shop for own use. (Formerly owned and operated by the Franklin Rolling Mill and Foundry Co. ; acquired by the Franklin Steel Co., Feb. 15, 1909 ; corporate title changed to Franklin Steel Works, June 15, 1912.)

Product : steel bars for reinforcing concrete, rounds, squares, small angles, channels, tees, "U" bars, deck sections, shapes for agricultural implements, etc., annual cap., 75,000 tons.

FRICK (H. C.) COKE CO. : general offices, Carnegie Bldg., Pittsburgh, Pa. ; branch office, Scottsdale, Pa.

A subsidiary of the United States Steel Corporation.

W. H. Clingerman, P. ; Clay F. Lynch, V. P. & G. S. ; D. H. Coble, Sc. ; Phillip Keller, T. ; C. P. Parker, A.

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, operate or control coal and coke properties, as follows :

The H. C. Frick Coke Co. owns and controls about 61,000 acres of coal and 22,000 acres of surface lands in Western Pennsylvania. It operates 36 coke plants having 12,371 bee-hive ovens in Fayette County, 22 coke plants with 6,992 bee-hive ovens in Westmoreland County, and 1 coke plant with 189 bee-hive ovens in Allegheny County, Pa. Total, 59 plants with 19,552 bee-hive ovens, annual cap., 14,692,000 net tons of coke. The company owns and operates plants producing coal for sale at Gates, Palmer, Ralph and Sarah mines in Fayette County, and the Chambers mine in Westmoreland 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, together with the properties they own, are as follows:

Republic-Connellsville Coke Co. owns 4,210 acres coal, and 286 acres surface lands in Fayette County, Pa.; also coal and coke plant of 100 bee-hive ovens at Bridgeport, Pa., and a coal plant at Filbert mine.

Sharon Coke Co. owns 1,096 acres coal and 286 acres surface lands in Fayette County, Pa.; also coal and coke plant of 350 bee-hive ovens at Ronco, Pa.

Sharon Coal & Limestone Co. holds under lease approximately 5,000 acres of steam coal and limestone property in Butler, Mercer, and Lawrence Counties, Pa.; also operates 4 coal mines.

United States Coal & Coke Co. holds under lease about 65,000 acres of coal lands in McDowell and Wyoming Counties, W. Va., and Tazewell County, Va. It has 12 mines and 2,151 bee-hive coke ovens.

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.

Bunsen Coal Co. owns about 66,000 acres of coal lands and 900 acres of surface lands in Vermilion County (Westville and Georgetown fields), and Franklin County (Southern Illinois field), Illinois; and in Vermilion and Vigo Counties (Clinton field), Indiana. On this property there are 5 active mines producing coal for steam and heating purposes.

FROG, SWITCH AND MANUFACTURING CO. (The), Carlisle, Pa.
John Hays, P. & G. M.; R. S. Hays, V. P. & S.; Anna A. Hays, Sc.; L. R. Brenneman, T.; J. P. Exton and W. L. Jackson, Managers Manganese Steel Foundry.

Brand: "Indian Brand" for manganese steel castings.

Works at Carlisle: foundry blt. 1913; 1 Tropenas steel converter (2-ton), first steel made July, 1913; 6 8-pot crucible fur. for melting alloys. Fuel, coke.

Product: manganese steel castings for sale for frogs, switches, and crossings, crusher dies, concaves, gearing, wearing plates, etc.; also makes gray iron castings; annual cap., 2,000 tons Tropenas steel castings.

Galesburg Coulter Disc Co., see Norwalk Steel and Iron Co.

Garry Iron & Steel Co., Niles, Ohio; acquired by the Brier Hill Steel Co., Feb. 1, 1912.

Gaulbert & Caskey, Philadelphia, Pa., see 1908 Directory, p. 257. Fair Hill Rolling Mill at York and American Sts., Philadelphia, was dismantled in 1914.

General Castings Co., Verona, Pa., see 1908 Directory, p. 295. Plant sold Feb. 2, 1910, by Commonwealth Trust Co., receiver, to the Standard Car Co., Butler, Pa. Verona Steel Castings Co. formed to take over the property in November, 1911.

GENERAL ELECTRIC CO., Schenectady, N. Y.

Org. and inc. 1892. Capital stock: com. auth., \$110,000,000, issued \$101,459,600; bonds, \$12,088,000.

E. W. Rice, Jr., P.; J. R. Lovejoy, A. W. Burchard and Owen D. Young, V. P.; M. F. Westover, Sc.; Henry W. Darling, T.; L. G. Banker, P. A.; W. C. Fish, M.

Sales offices in all large cities.

Everett Works, West Everett, Mass.: 2 A. O. H. fur. (15-ton); blt. 1900; first steel made Dec. 20, 1900. Fuel, oil. Foundry and a pattern shop connected with the works. (Formerly operated by Massachusetts Steel Casting Co.; acquired by present owners Nov., 1910.) 2 Tropenas converters (2-ton) and 2 cupolas dismantled 1907. Product: steel castings for sale for electric and general purposes from $\frac{1}{4}$ lb. to 60,000 lbs., annual cap., 11,000 tons.

Lynn Works, West Lynn, Mass.: 3 A. O. H. steel fur. (15-ton); 2 erected 1892 and 1 1898; first steel made Mar. 4, 1893. Fuel, oil. A small crucible steel department for the manufacture of special castings; also make gray iron castings. Galvanizing plant. (Formerly called West Lynn Works and operated by Thomson-Houston Electric Co.; acquired by present owners Jan. 1, 1909.) Product: steel castings for sale for electrical and general purposes, annual cap., 12,000 tons.

Pittsfield Works, Pittsfield, Mass.: One experimental Kjellin electric furnace, construction commenced in August, 1911; completed and put in operation on March 1, 1912; principally used for manufacturing non-ferrous metals.

Schenectady Works, Schenectady, N. Y.: 3 Heroult electric fur. (1, 2½, and 5-ton).

Product: tool steel and steel castings, annual cap., 1,400 tons.

GENESEE FURNACE CO., Perry-Payne Bldg., Cleveland, Ohio.

Price McKinney, P.; J. W. Corrigan, V. P.; J. E. Ferris, Sc. & T.; Robert Leitch, S.

Selling agents: Cleveland, Ohio, Corrigan, McKinney & Co.

Brand: "Genesee."

Genesee Furnace at Charlotte, N.Y.: 1 stack, 75' x 19' 3"; blt. 1868, last rebt. 1908; 5 brick stoves. Coke; Lake ore.

Product: foundry and gray forge pig iron, annual cap., 100,000 tons.

Georgia Steel Co., Cartersville, Ga.

O. T. Peoples, trustee in bankruptcy.

Rising Fawn Furnace, Rising Fawn, Ga.: 1 stack; blt. 1873-5, rebt. 1902-3; 73' x 18' 6"; 6 4-pass stoves (2 80' x 20'; 4 60' x 18'). Coke; local brown ore. (Formerly operated by Southern Steel Co.; acquired by Georgia Steel Co., Oct., 1906.) Annual cap., 72,000 tons foundry pig iron. *Last active in 1907.*

GERLINGER STEEL CASTING CO., 59th St. & National Ave., West Allis, Wis.

Org. and inc. Mar. 6, 1902. Capital stock: \$15,000.

W. E. Gerlinger, P. & G. M.; Geo. P. Gerlinger, V. P. & G. S.; C. A. Gerlinger, Sc., T., & P. A.

Works at West Allis: blt. 1902-03; 4 4-pot crucible fur., f. o. Jan. 12, 1903. Fuel, oil. One 3-phase A. C. Snyder electric fur. (2,000-lb.), construction commenced May 20, 1915. First electric steel made, Nov. 7, 1915. Installing additional electric fur. (1-ton).

Product: steel castings for sale for automobiles and general machinery purposes, up to 800 lbs. Also alloy steel castings. Annual cap., 1,150 tons crucible and 1,800 tons electric steel castings.

German, Edwin, Slatington, Pa.

Brands: "Slatington," "Slatington Engine Bolt," "Slatington Norway," "Slatington Special," "L. V. S."

Works at Slatington: blt. 1890; 6 single puddling fur.; 1 busheling fur.; 2 3-d. heat. fur.; 3 trains (20" 3-h. 1-st., 16" 2-h. 2-st., 10" 3-h. 5-st.) Fuel, bit. coal. (Formerly owned by Slatington Rolling Mill Co.; acquired by present owner, Dec. 24, 1915.) *For sale.*

Product: merchant bar iron, staybolt iron, horseshoe bars, carriage drop forging iron, etc., annual cap., 7,500 tons.

Girard Iron Co., see The A. M. Byers Co. of Ohio.

GLASGOW IRON CO., Pottstown, Pa.

Org. Sept. 11, 1875; inc. Sept. 17, 1875. Capital stock: com. auth. \$500,000, issued \$360,000.

Comly B. Shoemaker, P. & G. M.; Robert Shoemaker, Jr., V. P.; at 603 Harrison Bldg., Philadelphia, Pa. Harry W. Prizer, Sc.; Oliver E. Shuler, T.; James P. Roe, G. S.; at Pottstown, Pa.

Sales offices: Boston, Sargent Bldg., 45 Bromfield St., Harrington, Robinson & Co. (agents); New York, 88 Washington St., D. F.

Cooney & Co. (agents); Philadelphia, 603-5 Harrison Bldg., 15th & Market Sts.

Anvil Furnace (leased), Pottstown, Pa.: 1 stack, blt. 1867, last remod. 1906, 80' x 17'; 3 fire-brick stoves, 76' 3" x 19'; 2 steam blowing eng. (20,000 cfm.); 5 water-tube boilers, 1,000 H. P. Anthracite coal and coke mixed; magnetic and hematite ore. (Owned by the Pottstown Iron Co.) Product: special pig iron, annual cap., 50,000 tons. *Last active in 1910.*

Glasgow Iron and Steel Works (owned), Ninth Ward, Pottstown, Pa.: blt. 1874; 8 double puddling fur.; 1 rotary squeezer; 21" 2-h. 1-st. muck mill; sheared plate mill (30" x 96"), plates 10 gauge to 1" and up to 84" wide; 3 coal heat. fur. Flanging and dishing plant and plant for making buckled plates. Fuel, prod. gas and coal. (Plate Mill No. 2, blt. 1889, dismantled).

Product: muck bar, iron and steel bridge, tank, and boiler plates; flanged and dished boiler heads, manholes, etc.; charcoal flange and charcoal fire-box iron. Annual cap., 10,000 tons muck bar, 12,000 tons plates.

Pottstown Iron Works (leased), Pottstown, Pa.: blt. 1863; enl. 1867; 22 double puddling fur.; Roe mechanical puddling machine; 13 Siemens heat. fur. (3 2-d., 10 3-d.); 1 ham.; 36" 2-h. 1-st. blooming, 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 mill; 3 sheared plate mills, 32" x 112", 26" x 65", and 24" x 60". Fuel, bit. coal and prod. gas. Nail plant blt. 1863 and Bessemer steel works blt. 1885-86, 2 10-ton Bessemer converters, dismantled in 1914. (Owned by the Pottstown Iron Co.)

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.

Glen Iron Furnace, see John T. Church.

GLOBE IRON CO., Jackson, Ohio.

Org. and inc. 1872. Capital stock: \$120,000.

Eben Jones, P.; John E. Jones, Sc., T., G. M. & G. S. M.; Charles P. Chapman, A.; M. M. Weldon, G. S. & P. A.; at Jackson, Ohio. H. L. Chapman, V. P., at Columbus, Ohio.

Selling agents:

Buffalo, Charles G. Shepard.

Chicago, Domhoff & Joyce Co.

Cincinnati, Domhoff & Joyce Co., and Hickman, Williams & Co.

Cleveland, Domhoff & Joyce Co.

New York, Alley & Page, and Naylor & Co.

Pittsburgh, Eaton, Rhodes & Co.

Brand: "Globe."

Globe Furnace at Jackson: 1 stack, 76' x 17' (jacket blt. to receive an 18½' bosh); blt. 1900-01 and first blown in Feb. 12, 1901;

remod. 1912-13; 5 2-pass Foote stoves 75' x 18'; 2 steam blowing eng. (35,000 cfm.); 15 boilers (1 water-tube, 4 tubular and 10 flue), 1,200 H. P. Machine shop for own use. Raw coal and coke; Lake and native ore partly from own mines in Jackson Co., Ohio, and Huron, Ind., annual cap., 25,000 tons; also own limestone quarries in Lawrence Co., Ohio, annual cap., 80,000 tons.

Product: high silicon silveries and Bessemer ferro-silicon in pigs, annual cap., 48,000 tons.

GLOBE SEAMLESS STEEL TUBES CO. (The), 33rd Ave. and Burnham St., Milwaukee, Wis. Org. and inc. 1910.

F. W. Renshaw, P.; F. J. O'Brien, G. S. A.; at Chicago, Ill. Lawrence Fitch, V. P., Sc. & T.; George J. Thust, G. S.; at Milwaukee, Wis.

Sales offices: Chicago, Peoples Gas Bldg., McClernan & Co., (agents); Detroit, Ford Bldg.

Works at Milwaukee: blt. 1910; f. o. Feb., 1911; 12 heat. fur.; 2 piercing mills; 8 stands of 20" rolls. Fuel, coal.

Product: rolled blanks for own use; hot rolled (2 $\frac{5}{8}$ " to 4" O. D.) and cold drawn ($\frac{1}{2}$ " to 4" O. D.) steel tubing, annual cap., 24,000 tons.

Godcharles Co. (F. A.), Milton, Pa.

Company in process of voluntary liquidation.

Milton Nail Works: blt. 1875; rebt. 1899: 2 single and 10 double puddling fur., 2 heat. fur., 1 rotary squeezer, 2 trains (1 3-h. puddle and 1 20" finishing) and 101 cut nail mach. Fuel, coal. *For sale.*

Product and annual cap.: muck bar (15,000 tons) and iron and steel cut nails and spikes (200,000 kegs).

GOSHEN IRON CO. (The), duPont Bldg., Wilmington, Del.

C. M. Shanahan, Receiver, Covington, Va.

A. J. Moxham, P.; Isaac Fagg, Sc.; F. E. Fenton, T.; at Wilmington, Del. John Boyt, G. M.; at Goshen, Va.

Selling agent: Rogers, Brown & Co.

Brands: "Victoria" and "Goshen."

Victoria Furnace at Goshen, Va.: 1 stack, 75' x 18'; blt. 1882-3, last rebt. 1902; 1 Foote and 3 Siemens-Cowper-Cochrane stoves. New River coke; local ore. Owns coal mine and 59 bee-hive coke ovens at Elverton, West Va., annual cap., 18,000 net tons; also brown ore property called the Rich Patch mines. (Formerly owned and operated by the Chapman Iron, Coal & Coke Co., Inc., leased by the Goshen Iron Co., on Jan. 25, 1907, and purchased Sept. 1, 1910.) *Last active in 1910.*

Product: foundry, basic, and forge pig iron, annual cap., 50,000 tons.

GOULD COUPLER CO., 30 E. 42nd St., New York City.

Charles A. Gould, P.; William S. Gould, V. P.; F. P. Huntley, V. P. & G. M.; Geo. G. Milne, Sc. & T.

Sales office: Chicago, Ill., The Rookery.

Works at Depew, N. Y.: blt. 1903; 4 annealing fur.; 4 Wellman B. O. H. fur. (25-net ton); first steel made Nov. 30, 1903. Fuel, coal and prod. gas.

Product: steel castings for sale and for own use; also malleable castings, forged locomotive and car axles, etc., annual cap., 50,000 tons.

GRAND CROSSING TACK CO., 79th St. and South Chicago Ave., Chicago, Ill.

Org. Aug. 29, 1883; inc. 1908.

O. N. Hutchison, P., T., & G. M.; E. W. Hutchison, Sc. & G. S. Brand: "Grand Crossing Tack Co."

Grand Crossing Works: 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; 70 wire drawing blocks, 80 wire nail machines and 30 cut nail machines; wire galvanizing pot. Fuel, bituminous coal.

South Chicago Works: blt. 1902-3; 2 Wellman stationary B. O. H. fur. (40-ton); first steel made July, 1903; 2 4-hole soaking pits and 35" blooming and billet mill. Fuel, prod. gas. Machine shop for own use. Annual cap., 50,000 tons ingots, 45,000 tons small billets for own use.

Product: wire rods, wire, wire nails, staples, barbed wire, field fencing, rivets, tacks, and iron and steel cut nails; 1 $\frac{3}{4}$ " square billets for use of company. Annual cap., 45,000 tons of wire rods, 30,000 tons of wire, 300,000 kegs of wire nails, 3,000 tons of rivets, 1,500 tons of tacks, 500 tons of staples, 30,000 kegs of cut nails

GRAND TRUNK RAILWAY SYSTEM, Montreal, P. Q., Canada.

W. D. Robb, S. Motive Power.

Works at Point St. Charles, Montreal: blt. 1891-92, f. o. May 9, 1892; 3 3-d. heat. fur.; 12" 3-h. 4-st. merchant mill. Foundry with annual cap. of 5,950 tons gray iron castings; also machine shop for own use. Fuel, bit. coal.

Product: bars, angles, and tees 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, blt. 1890, idle 1898-1902, revived 1902; 55' x 12' 6"; 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 from West Point, Tenn. Company owns mines at West Point, annual cap., 35,000 tons. (Formerly owned by Rockdale Iron Co., incorporation papers cancelled, April 1, 1911.)

Product: ferro-phosphorus, annual cap., 12,000 tons.

Gray, J. J., see 1908 Directory, p. 341, owns Aetna Furnace, a charcoal stack at Aetna, Tenn. The property was leased to Napier Iron Works, Jan. 1, 1909, who operate iron ore mines on the property. The blast furnace stack is practically dismantled and abandoned.

Great Western Rolling Mill Co., see 1908 Directory, p. 407, project abandoned in 1909.

Grey Iron and Steel Foundry, Tacoma, Wash.

Bessemer converter not completed. See 1912 Supplement, p. 53.

GRIFFITHS CHARCOAL IRON MILLS, Washington, Pa.

Wm. H. Griffiths, P. & G. M.; N. R. Baker, Sc. & T.

Registered Trade Mark: Griffiths' Charcoal Bloom.

Works at Washington, Pa.: forge blt. 1901-02; 8 knobbling fires; 1 hammer (6,000-lb.); 2 heat. fur.; 24" bar mill; first blooms made Oct., 1902. Product: hammered charcoal iron blooms, rolled to sheet and tinplate bars for own use. Sheet mills: 2 sheet and 2 pair fur.; 2 annealing fur.; 2 hot black plate mills (26" x 32", 26" x 38"); 2 cold mills. Fuel, natural gas and coal. Product: charcoal iron black plates for tinning, annual cap., 5,600 tons. Tin house: 7 sets (4 machines and 3 old-style hand-dipping sets). Fuel, natural gas.

Product: charcoal iron terne plates, annual cap., triple turn, 90,000 base boxes.

Griswold Co. (The), Sterling, Ill., see Dillon-Griswold Wire Co.

GULF STATES STEEL CO., Brown Marx Bldg., Birmingham, Ala.

Org. and inc. Nov. 1, 1913. Capital stock: com. auth. \$7,500,000, issued \$3,284,500; 1st pref. 7% cum. auth. \$3,000,000, issued \$1,260,000; 2nd pref. 6% non-cum., auth. \$5,000,000, issued \$3,107,000; bonds, \$289,000 purchase money obligations.

James Bowron, P.; H. Sanborn Smith, V. P.; A. R. Forsyth, V. P. & T.; W. H. Moore, Sc.; J. W. Newell, A.; C. C. Brown, G. S. M.; B. F. Tyler, P. A.; at Birmingham. C. A. Moffett, Works M.; at Alabama City.

Acquired on Dec. 1, 1913, the plants and properties formerly owned and operated by the Standard Steel Co. which succeeded the Southern Iron and Steel Co., successors to the Southern Steel Co.

Company owns and operates a blast furnace and steel plant at Alabama City, Ala., and owns and operates mines at Virginia, Altoona and Shannon.

Alabama City Works, Alabama City, Ala.: Alabama City Furnace (formerly Gadsden Furnace No. 1) 1 stack, 90' x 20', blt. 1902-03, f. o. Jan. 17, 1904; remod. 1905-06; skip hoist and revolving top; 4 4-pass hot blast stoves; 4 steam blowing eng. (50,000 cfm.); 11

Stirling water-tube boilers, 4,125 H. P.; 1 Heyl and Patterson single-strand casting machine. Machine shop for own use. Coke; local ore. Molten metal to O. H. fur.

Product: basic pig iron, annual cap., 100,000 tons.

By-product coke plant: 37 Koppers ovens contracted for; annual cap., 164,000 net tons; by-product recovery plant and benzol plant.

Steel Works: blt. 1903-04; f. o. June 24, 1904; 6 B.O.H. fur. (50-ton); 4 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.; 170 wire drawing blocks, for wire to No. 18 gauge; 3 galvanizing pots; 106 wire nail machines, all sizes from 10" spike down; 68 barbed wire machines. Fuel, coal and prod. gas. Foundry and machine shop for own use.

Ensley Works at Ensley, dismantled 1910. Weller Rolling Mill and Forge acquired in Oct., 1910, now considered part of Alabama City Works. Puddling furnaces and spike machines have been dismantled.

Product: ingots, blooms billets, rods, merchant bars, tie plates, plain and galvanized wire, field fencing, barbed wire, wire nails and spikes. Annual cap., 288,000 tons ingots, 250,000 tons billets, 50,000 tons bars, tie plates, etc., 108,000 tons wire rods, 50,000 tons plain or galvanized wire, 410,000 kegs (100-lb.) wire nails, 20,000 net tons barbed wire.

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 now sinking a slope at Shannon; not mining ore at present.

The company owns 4,200 acres of coal lands at Virginia, and 4,000 acres at Altoona, Ala. Its coal mines have an annual cap. of about 400,000 tons.

The company also owns 300 bee-hive coke ovens at Virginia, annual cap., 150,000 net tons.

HALCOMB STEEL CO., Syracuse, N. Y.

Org. Jan., 1905; inc. Jan. 16, 1905. Capital stock: \$1,800,000.
John A. Mathews, P. & G. M.; W. A. Mackenzie, Sc.; H. S.
Fulmer, T.; J. A. Distin, A. G. M.; R. H. Filsinger, P. A.

Sales offices:

Boston, 303 Congress St., Hawkrigde Bros. (agents).

Chicago, 608 W. Adams St.

Cleveland, 1274 Ontario St.

Philadelphia, 633 Arch St.

Works at Syracuse: blt. 1905-06; f. o. 1906; 1 B. O. H. fur. (20-ton) used for melting stock for electric fur.; 1 Heroult electric fur. (4-ton); 1 Snyder electric fur. (3-ton); 5 24-pot cruc. fur.; 8 gas prod.; 9 heat. fur. (7 2-d. and 2 3-d.); 5 trains (24" cogging under construction; 14" 3-h. 5-st., 12" 3-h. 7-st., and 9" 3-h. 8-st. bar mills; one 18" sheet mill); 4 comb. pair and sheet fur.; 6 annealing fur.; 8 steam ham. (600 to 12,000-lb.), hydraulic press (650-ton). Fuel, coal and prod. gas. Wire and bar-drawing and cold-rolling departments. Machine shop for own use. Will install Apr. 1, 1916, one additional Heroult electric fur. (6-ton), annual cap., 7,200 tons.

Operates under lease the plant of the Syracuse Crucible Steel Co. at Syracuse.

Product: alloy steel ingots, 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., 7,350 tons electric ingots, to be increased to 15,000 tons; 8,400 tons crucible ingots; 20,000 tons of rolled and forged products.

Hamilton, John, see 1908 Directory, p. 471. Tinplate plant at Tecumseh St., Pittsburgh, Pa., abandoned in 1910.

Hamilton Iron and Steel Co., see 1908 Directory, p. 364, blast furnace at Hamilton, Ohio, known as Miami Furnace, sold at trustees sale Dec. 14, 1911, and bid in by the bondholders who organized the Miami Iron and Steel Co. to operate it.

Hamilton Steel and Iron Co. (The), Ltd., see Canadian Supplement, p. 12, merged in The Steel Company of Canada, July 1, 1910.

HANGING ROCK IRON CO. (The), Hanging Rock, Ohio.

Org. and inc. April 6, 1900. Capital stock: com. \$450,000.

D. B. Meacham, P.; J. K. Pollock, V. P.; J. R. Houston, T.; at Carew Bldg., Cincinnati, Ohio. Mason P. Herron, Sc.; W. M. Jefferys, G. S.; at Hanging Rock, Ohio.

Selling agents: Rogers, Brown & Co.

Brand: "Hamilton."

Hamilton Furnace, Hanging Rock: 1 stack, '5' x 16', blt. 1883; f. o. Mar., 1886; 4 Foote stoves; steam blowing eng. (35,000 cfm.); 5 water-tube boilers, 1,850 H. P. Pocahontas coke; Lake and native block ore. Block ore and limestone from own mines at Pine Grove, Ohio; annual cap., 1,000 to 2,000 tons of ore, 20,000 tons of limestone. Machine shop for own use.

Product: foundry, malleable, and basic pig iron, annual cap., 50,000 tons.

Hanover Union Steel Casting Co., Inc., Hanover, Pa., see 1908 Directory, p. 282, steel casting plant dismantled in 1908.

HARRISBURG PIPE & PIPE BENDING CO., Harrisburg, Pa.

Org. and inc. Dec. 28, 1899. Capital stock: com. auth. \$1,000,000, issued \$911,500; pref. 7% cum. auth. \$150,000, issued \$97,100; bonds \$1,100,000.

D. E. Tracy, P.; E. Z. Wallower, V. P.; W. T. Hildrup, Jr., Sc., T., G. M., G. S. M., & P. A.; W. P. Starkey, G. S.

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); 2 2-d., 2 3-d. and 2 cont. regenerative billet and slab heat. fur.; 3 trains (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 gauge. Annual cap. from 60,000 to 75,000 tons of ingots, and 60,000 tons of rolled material.

Harrisburg Rolling Mill Co., Harrisburg, Pa., see 1908 Directory, p. 282, dismantled in 1912.

HARROW SPRING CO., First National Bank Bldg., Milwaukee, Wis.

Inc. July 11, 1900. Capital stock: auth., \$500,000, issued \$300,000 H. J. Schlesinger, P.; C. N. Turner, V. P. & G. S. M.; Wilmut Saeger, Sc.; H. H. Springford, T. & A.; J. P. McGuigan, P. A.

Works at Kalamazoo, Mich.: blt. 1900-01, f. o. Jan. 30, 1901; 2 4-d. reverb. heat. fur.; 2 trains (16" 3-h. 3-st., 9" 3-h. 4-st. Belgian). Fuel, bit. coal. Shop for manufacture of railroad car springs, car fenders, track scrapers, agricultural implements, etc.; another for harrow teeth, rake teeth, etc. Machine shop for own use. Installing a 6-ton Heroult electric fur. to be completed about April 1, 1916, annual cap., 7,000 tons ingots.

Product: merchant bar steel, spring and special steels; annual cap., 16,000 tons.

Hartmann, Hay & Reis, Belleville, Ill., see 1908 Directory, p. 386, rolling mill and cut nail works dismantled in January, 1914.

HART-PARR CO., Charles City, Iowa.

Org. July 19, 1912; inc. July 24, 1912. Capital stock: com. \$1,000,000; pref. 7% cum., \$1,500,000.

C. W. Hart, P. & G. M.; A. E. Ellis, V. P.; C. H. Parr, Sec.; M. W. Ellis, T.; E. L. Jaco, G. S. M.; F. S. Spear, P. A.

Sales offices: Grand Forks, North Dakota; Great Falls, Montana; Kansas City, Mo.; Minneapolis, Minn.; Peoria, Ill.; Portage la Prairie, Manitoba, Canada; Regina, Saskatchewan, Canada; Wichita, Kansas; and numerous local agencies.

Works at Charles City: blt. 1901; 2 B. O. H. fur. (10-ton) added 1909-11; first steel made April 6, 1911. Fuel, crude oil. Machine shop for own use.

Product: steel castings for own use (annual cap., 15,000 tons); also gray iron and semi-steel castings. Manufacture gasoline traction engines.

HASKELL & BARKER CAR CO., Inc., Michigan City, Ind.

Org. 1852, inc. 1871. Capital stock: com. \$100,000.

Edward F. Carry, P. & G. M.; D. A. Crawford, T.; at 707 Railway Exchange, Chicago. Charles A. Liddle, V. P.; R. E. Frame, A. P.; C. R. Hammer, A.; W. N. Oehm, G. S.; F. O. Reemer, P. A.; at Michigan City. Arthur Van Brunt, V. P.; A. J. McAllister, Sec.; at 5 Nassau St., New York.

Sales office: Chicago, Ill., 1439 First National Bank Bldg.

Works at Michigan City: blt. 1852; O. H. fur. added about 1890; 3 cupolas, 24 gas prod.; 30 annealing fur.; 4 air fur. (10-ton), 6 A. O. H. fur. (3 10-ton, 3 25-ton); 2 oil fur. Fuel, prod. gas.

Product: car wheels, gray iron castings, and malleable iron castings for sale and own use; also builds freight cars. Annual cap., 150,000 car wheels, 15,000 tons gray and 39,000 tons of malleable iron castings.

Hazleton Sheet Steel Co., see 1908 Directory, p. 481; 1910 Suplt., p. 13; 1912 Suplt., p. 20; built the Hazleton Sheet Steel Works at Hazleton, Pa., in 1907-08; acquired by the Union Sheet and Tin Plate Co., Oct., 1909. The Union Sheet and Tin Plate Co. went into the hands of a receiver July 28, 1910, and the Hazleton works were sold Sept. 21, 1911, and bid in by the bondholders. In March, 1914, The Imperial Steel Co. was formed by E. Stanford and others and an option for the purchase of the plant acquired. The option was allowed to lapse. The plant was subsequently dismantled completely in 1914-15.

Heany Fire Proof Wire Co., see 1908 Directory, p. 282. Open-hearth furnace dismantled in 1909.

Heckscher (Richard) and Sons Co., formerly owned Swede Furnaces, Swedeland, Pa., merged into Alan Wood Iron and Steel Co., Dec. 1, 1911.

Hecla Iron and Mining Co., Ironton, Ohio, see 1908 Directory, p. 366, formerly owned charcoal blast furnace known as Hecla Furnace and extensive holdings of mineral and other lands. The property was sold at receivers sale, Sept. 22, 1913. The blast furnace, idle since 1904, has been dismantled.

HELLER BROTHERS CO., Newark, N. J.

Inc. June 29, 1899. Capital stock: com. auth., \$500,000, issued, \$498,000; pref. 7% cum. auth., \$200,000, issued \$151,500.

Paul E. Heller, P.; Arnaud G. Heller, V. P. & Sc.; Ernest A. Geoffroy, T.

Works at Newark: crucible steel works blt. 1882; 1 30-pot crucible fur.; 10 heat. fur. (8 2-d. and 2 3-d.); 5 ham. (500-lb. to 3-ton); 2 trains (16" 3-h. 1-st. cogging, 10" 3-h. 7-st. finishing). Fuel, bit. coal and prod. gas. Machine shop for own use.

Product: crucible ingots, clay crucible steel for own use; rasps, files, and high-grade tools, etc. Annual cap., 1,500 tons of ingots and 5,000 tons, s. t., rolled and hammered products.

Helmbacher Forge and Rolling Mills Co., see 1908 Directory, p. 219, practically controlled and operated by the American Car and Foundry Co. for some years, transferred its properties to the American Car and Foundry Co., Feb. 1, 1912, and was dissolved later in same year.

HERCULES FORGE CO., S. Senate & Merrill Sts., Indianapolis, Ind.
Org. and inc. May 16, 1914. Capital stock: com. auth., \$25,000, issued, \$15,000.

J. H. Holliday, Jr., P. & T.; Alexander R. Holliday, V. P.; Ward H. Dean, Sc.

Selling agent: Indianapolis, Ind., Paul R. Jordan & Co.

Works at Indianapolis: 9 heat. fur., 6 ham., 1 special mill. Fuel, coal, coke and oil. Department for the manufacture of drop forgings, miscellaneous forgings, etc.

Product: hammered and rolled steel wheels for dry kiln trucks, size of wheels 6" to 8". Annual cap., 300 tons of wheels and 500 tons of forgings.

HERCULES MANUFACTURING CO., Centerville, Iowa.

Org. and 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, Iowa: blt. 1912; first crucible steel made Mar. 16, 1912; 8 6-pot crucible fur. Fuel, oil.

Product: crucible steel castings for sale for agricultural machinery, mine car wheels, etc., annual cap., 1,000 tons.

HESS STEEL CO. (The), Baltimore, Md.

Org. and inc. Nov., 1908. Capital stock: com. \$625,000; pref. auth., \$125,000, issued \$47,800; bonds, \$25,000. Formerly called Hess Steel Casting Co.; merged in Hess Steel Corporation in March, 1916.

Henry Hess, P.; at Witherspoon Bldg., Philadelphia, Pa. H. L. Hess, Jr., V. P.; J. J. Quinn, Sc. & T.; Edmund Von Maltitz, G. S.; at Bridgeton, N. J.

Brand: "Hessteel."

Works at Bridgeton, N. J.; blt 1911; first steel, April 13, 1911; 4 4-pot and 6 8-pot oil-burning crucible fur.; 1 Stassano electric fur. (1-ton) blt. 1913, f. o. Dec. 16, 1913. Fuel, oil and electricity.

Product: alloy steel ingots for sale, annual cap., 1,200 tons.

HESS STEEL CORPORATION (The), Baltimore, Md.

Org. and inc. Nov., 1915. Capital stock: com. auth., \$1,000,000; issued \$750,000; pref. auth. \$500,000, issued \$125,000.

Henry Hess, P.; at 928 Witherspoon Bldg., Philadelphia, Pa. H. L. Hess, 1 V. P. & Sc.; E. von Maltitz, 2 V. P.; at works, Baltimore. Eugene Levering, T.; at Bank of Commerce, Baltimore.

Building works at Baltimore, Loney's Lane & Penna. R. R.: 2 6-ton Heroult elec. steel fur.; 2 3-d. heat. fur.; 2 trains (9" 3-h. 5-st bar and rod, 20" 3-h. 3-st. bar). Fuel, coal. Will probably be completed in April, 1916.

Product: ingots, billets, bars, rounds, flats, etc.; also alloy steels. Annual cap., 10,000 tons ingots and 10,000 tons rolled products.

HEWITT STEEL CORPORATION, Newark, N. J.

Leased works of The Titan Co., Jan. 1, 1916. Will make railroad specialties, side frames, bolsters, etc.

HIGHLAND IRON AND STEEL CO. (The), Terre Haute, Ind.

Org. and inc. Feb. 26, 1901. Capital stock: \$300,000.

Philip Matter, P.; at Marion, Ind. John L. Smith, V. P.; Wm. M. Myers, Sc.; Walter C. Ely, T. & G. M.; at Terre Haute, Ind.

Selling agents: Chicago, Ill., 123rd St. & Ashland Ave., B. L. Verner; Louisville, Ky., Paul Jones Bldg., R. M. Kelly, Jr.; St. Louis, Mo., 1423 Pierce Bldg., J. I. Swan.

Product: iron and steel merchant bars, scrap bar, puddled muck bar and special shapes.

Terre Haute Works, Terre Haute, Ind.: blt. 1901; f. o. Nov. 25, 1901; 8 double puddling and 5 busheling fur., 5 4-d. heat. fur.; 3 trains (20" 3-h. 2-st. puddle; 20" bar mill with 1 st. 2-h., 2-st. 3-h.; and 1 comb. 10" and 12" guide mill with 12" 3-h. 1-st. Belgian roughing rolls, 10" 3-h. 4-st. and 10" 2-h. 1-st. finishing). Fuel, bituminous coal. Machine shop for own use. Product: iron and steel merchant bars and special shapes. Annual cap., 50,000 tons.

West Pullman Works, 123rd St. & Ashland Ave., Chicago, Ill.: construction commenced Mar., 1909, f. o. Sept. 11, 1909; 2 pile fur., 2 busheling fur.; 4 4-d. heat. fur., 2 double puddling fur.; 10 shears; 3 trains (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. (Formerly owned by Blue Island Rolling Mill and Car Co, acquired by present owners Aug. 25, 1910). Product: scrap bar, $\frac{1}{2}$ " to 4" iron rounds and squares, $\frac{1}{2}$ " to 12" iron flats. Annual cap., 25,000 tons of scrap bar and 40,000 tons iron merchant bars.

Hill (William E.) & Co., Kalamazoo, Mich., see 1912 Supplement, p. 48. Converter steel castings plant at Kalamazoo acquired by William E. Hill Company, Mar. 23, 1912; converter idle since 1911 was dismantled in 1914. Company makes gray iron and brass castings but no longer makes steel castings.

HILLMAN LAND & IRON CO., Hematite, Ky. (telegraph address, Cadiz).

Brand: "Hematite."

Centre Furnace, Hematite: 1 stack, orig. blt. 1852; last remod. 1905; 35' x 9'; 1 steam blowing eng.; 2 cylindrical boilers, 100 H. P. Charcoal; local hematite ore. Mines on property with annual cap. of 10,000 tons; own limestone quarries near furnace. Product: cold blast charcoal pig iron, annual cap., 3,000 tons. *Last active in 1912. For lease.*

HIRSCH ROLLING MILL CO., Ecoff Ave., St. Louis, Mo.

Org. and inc. 1900. Capital stock: \$225,000.

Marcus A. Hirsch, P., T. & G. M.; V. R. Hirsch, V. P.; A. L. Hirsch, Sc.

Works at 6800 Manchester Ave., St. Louis: blt. 1900; f. o. July 5, 1900; 7 heat. fur. (3 3-d. and 4 4-d.); 2 forge fires; 3 trains (18" 3-h. 3-st. muck; comb. 8" & 10" 3-h. 7-st. Belgian, 18" 3-h. 4-st. finishing); 2 spike machines; also bolt, nut, rivet, etc., department. Fuel, bituminous coal.

Product: merchant and refined bar iron and steel; iron and steel angles, shapes, light rails, plain and deformed concrete reinforcing bars; rounds for shrapnel and high explosive shells; spikes, bolts, nuts, rivets and washers. Annual cap., 30,000 tons.

Hollidaysburg Iron and Nail Co., Hollidaysburg, Pa., Hollidaysburg Iron Works, see 1908 Directory, p. 288. Entire capital stock of this company acquired by Iron and Steel Products Co., June 8, 1909. Works sold to Gustave Benjamin, March, 1911, and dismantled in 1915. May install new machinery.

HOOPES AND TOWNSEND CO., 1330 Buttonwood St., Philadelphia, Pa.

Org. 1849, inc. 1899. Capital stock: com. auth., \$1,000,000, issued, \$300,750.

Clement R. Hoopes, P.; Barton Hoopes, Jr., V. P.; Albert B. Marks, Sc.; John M. Zook, T.

Selling agents: New York City, 30 Church St., Charles H. Gockeler; San Francisco, Cal., 160 Beale St., H. L. Van Winkle.

Properties: rolling mill at Hoopestown, Pa., and bolt, nut, and rivet works at 1330 Buttonwood St., Philadelphia.

Rolling Mill at Hoopestown: blt. 1901; f. o. Oct. 16, 1901; 4 puddling fur. (1 single, 3 double); 6 3-d. heat. fur., 7 busheling fur.; 3 trains (20" 3-h. 2-st. muck; 12" 3-h. 5-st. finishing; 9" finishing with 14" 3-h. 1-st. roughing and 9" 3-h. 4-st. finishing). Fuel, bit. and anth. coal and oil. Machine shop for own use.

Product: bar iron and steel for own use: bolts $\frac{1}{4}$ " to 6" dia.; nuts $\frac{1}{4}$ " to 6" dia.; rivets $\frac{3}{16}$ " to $1\frac{1}{2}$ " dia.; washers $\frac{1}{8}$ " to 5" dia.; building irons, rods, etc. Annual cap., 25,000 tons of bars.

Howard Iron and Tool Co., see 1908 Directory, p. 288, Howard Rolling Mills at Howard, Pa., dismantled in 1912.

HOWE & SAMUEL, INC., Harrison Bldg., Philadelphia, Pa.

F. P. Howe, P.; Silas M. Tomlinson, V. P.; F. Samuel, Sc. & T.; M. Hurley, G. M.

Brand: "Howe & Samuel."

Works at Danville, Pa.: blt. 1913-14; f. o. Feb. 10, 1914. 8 double puddling fur.; 19" 3-h. 1-st. muck mill. Fuel, bit. coal.

Product: muck bar, annual cap., 10,000 tons.

Hubbard & Co., see 1908 Directory, p. 314. Works at Waynesburg, Pa., sold in 1908 to The Massillon Rolling Mill Co. The plant was dismantled in Sept., 1908, and the machinery used to partly equip new plant of last named company at Massillon, Ohio.

HUBBARD STEEL FOUNDRY CO., East Chicago, Indiana.

Inc. Jan., 1910. Capital stock: \$500,000.

Frank Cordes, P. & G. M.; Albert Pack, V. P. & T.; Walter L. Ronstrom, Sc.

Sales offices: Chicago, Ill., 1128 Karpen Bldg.; Pittsburgh, Pa., 502 German National Bank Bldg.

Works at 144th St. & Railroad Ave., East Chicago, Ind.: blt. 1910; first steel made Aug. 26, 1910; 2 A. O. H. fur., (25-ton and 30-ton). Fuel, oil.

Product: O. H. steel castings and steel rolls, manganese and other alloy steel castings for sale. Annual cap., 12,000 tons.

Hudson Iron Co., see 1908 Directory, p. 250, owned Secaucus Furnace at Secaucus, N. J., and extensive iron ore mining property in New

York State. Property sold in 1914 under foreclosure proceedings to Fort Montgomery Iron Corporation. The blast furnace at Secaucus was dismantled in 1914.

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. Stay-bolt."

Delaware Rolling Mill at Richmond St. and Susquehanna Ave.: blt. 1870; 10 single puddling fur.; 6 heat. fur. (4 2-d., 2 3-d.); 5 trains (18" 3-h. 2-st. muck; 18" 3-h. 1-st. muck; two 10" 3-h. 4-st. finishing, 8" 3-h. 4-st. finishing). Fuel, bit. coal.

Product: bar iron specialties, bands, hoops and rods. Annual cap., 27,000 tons.

HULL IRON AND STEEL FOUNDRIES, Ltd., Hull, P. Q., Canada.

Thomas H. Birks, P. & T.; Chas. H. Broadhead, V. P.; O. Pullan, Sc.; A. H. Coplan, G. M.

Works at Hull: blt. 1913-14, first steel made April 22, 1914; 3 German converters (2-ton); 4 cupolas. Fuel, coke.

Product: steel castings for sale and own use; alloy steel castings, annual cap., 10,000 tons.

Huron Steel and Iron Co., Norwalk, Ohio, see Norwalk Steel and Iron Co.

HUSSEY-BINNS SHOVEL CO., 223 Fourth Ave., Pittsburgh, Pa.

Org. 1874; inc. Feb., 1902.

R. H. Binns, P.; E. B. Alsop, V. P.; H. G. Veeder, Sc. & P. A.; R. H. Binns, Jr., T.; Donald McRae, A.; at 223 Fourth Ave., Pittsburgh. Joseph H. Grubb, V. P.; at Philadelphia. F. M. Haines, S.; at Charleroi, Pa.

Works at Charleroi, Pa.: 8 6-pot crucible fur., heat. fur., trains of rolls, ham., and machines used in shovel making. Fuel, electric power and nat. gas.

Product: crucible cast steel for own use: shovels, spades, and scoops. Annual cap., 6,000 tons of products.

Hyde Park Steel Casting Co., Hyde Park, Mass., acquired works of New England Steel Casting Co. in May, 1910, and operated them for about a year. Plant was taken over by Pruyn & Bilodeau in Nov., 1912, for manufacture of ball bearings.

Hydraulic Machine Co., Pittsburgh, Pa., Estate of Henry Aiken, owner. Property sold in April, 1911, and steel, iron and brass foundries dismantled; see 1908 Directory, p. 295.

ILLINGWORTH (JOHN) STEEL CO., Frankford, Philadelphia, Pa.

Est. 1835, inc. 1900. Capital stock: \$100,000.

John Illingworth, P.; Charles P. Soden, V. P.; William H. Illingworth, Sc.; Clarence Illingworth, G. M. S. & P. A.

Works at Frankford: one 36-pot crucible fur., annual cap., 3,000 tons; 9 heat. and annealing fur.; 5 trains (16" roughing, 14", 12" and 9" bar, 18" sheet); 4 hammers (800 to 3,500-lb.). 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., 15,000 tons hammered and rolled products.

Illinois Car and Equipment Co. (The), owns rolling mill and forge shop at Anniston, Ala., leased to Southern Munitions Corporation and operated by Anniston Ordnance Co.

ILLINOIS STEEL CO., 208 South LaSalle St., Chicago, Ill.

Inc., May 2, 1889.

A subsidiary of the United States Steel Corporation.

E. J. Buffington, P.; T. W. Robinson, 1 V. P.; G. G. Thorp, 2 V. P.; T. J. Hyman, Sc. & T.; H. Morrison, A. Sc.; J. C. Hoot, P. A.; George Baker, G. M. S.; F. T. Bentley, T. M.

Sales offices:

Birmingham, Brown-Marx Bldg.

Boston, Telephone Bldg.

Buffalo, Marine National Bank Bldg.

Cincinnati, Union Trust Bldg.

Cleveland, Rockefeller Bldg.

Denver, First National Bank Bldg.

Detroit, Ford Bldg.

New Orleans, Maison Blanche.

New York, Hudson Terminal Bldg.

Philadelphia, Widener Bldg.

Pittsburgh, Carnegie Bldg.

St. Louis, Third National Bank Bldg.

St. Paul, Pioneer Bldg.

Product: Bessemer and basic pig iron, spiegeleisen, ferro-manganese, and ferro-silicon; Bessemer, open hearth and electric steel ingots; blooms, billets, slabs, sheet and tinplate bars; rails, light rails and small billets; structural shapes, beams, angles, channels, tees, zees, rounds, etc.; universal and sheared plates; angle bars, joints and splices; tie plates, base plates, etc.; spike rods, spikes, bolts, nuts, screw spikes; merchant bars, rounds,

squares, flats, bands and special shapes; wire rods; railway car and locomotive axles; steel, iron and brass castings, rolls, ingot molds and stools for own use.

The Company owns and operates the Joliet Works, Joliet, Ill.; Milwaukee Works, Milwaukee, Wis.; South Works and Union Works, Chicago, Ill.; North Works, warehouse and fitting shop, Chicago, Ill.; it also operates the Gary Works, Gary, Ind., owned by the Indiana Steel Co.

Gary Works, Gary, Indiana (operated by Illinois Steel Co., owned by Indiana Steel Co.).

Blast Furnaces: 8 stacks, Nos. 5 to 12; each 88' x 21' 6"; construction begun July 15, 1906. No. 12 blown in Dec. 21, 1908; No. 11, Dec. 29, 1908; No. 10, Jan. 26, 1909; No. 9, June 11, 1909; No. 8, Nov. 23, 1909; No. 7, Dec. 4, 1909; No. 6, Mar. 16, 1910; No. 5, Mar. 16, 1911; 32 Massicks & Crooke stoves, 100' x 22'; 20 blowing eng. (16 gas, 4 steam); 6 Uehling double-strand casting machines; 3 slag granulating pits serve 6 furnaces. Flue dust sintering plant. Machine shop for own use. By-product coke; Lake ore. Molten metal to mixers.

Product: basic pig iron, annual cap., 1,311,200 tons.

By-product Coke Plant: 560 Koppers ovens, annual cap., 2,900,000 net tons. By-product recovery plant and benzol plant.

Open Hearth Depts.: 3 plants (of 14 fur. each); 42 Siemens stationary B. O. H. fur. (28 90-ton, 14 100-ton); 5 mixers (three 300-ton, two 400-ton). Fuel, producer gas. Twenty eight waste-heat steam boilers. Annual cap., 2,160,000 tons open hearth ingots.

Foundry: 1 Siemens stationary A. O. H. fur. (20-ton), annual capacity, 7,500 tons steel castings for own use.

Rail Mill: blt. 1908-09, f. o. Feb. 17, 1909; rail mill with 40" 3-h. 1-st. blooming, 28" 2-h. 1-st. finishing; 12 soaking pits. Fuel, producer and coke oven gas. Annual cap., 900,000 tons rails.

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 soaking pits. Fuel, producer and coke oven gas. All ingots pass through the 40" and 32" mills. Product, blooms and billets from 9" x 9" to 1 $\frac{3}{4}$ " x 1 $\frac{3}{4}$ "; sheet bars from 8 lb. to 43 lb. per foot. Annual cap., 900,000 tons.

Slab Mill: blt. 1913-14, f. o. June 29, 1914; 84" 2-h. 1-st. reversing slabbing mill; 8 soaking pits. Fuel, coke oven gas. Product: slabs, 20" x 60" and under; billets, 30" x 30" and under. Annual cap., 480,000 tons.

Universal Plate Mill: blt. 1911, f. o. Nov. 14, 1911; 5 slab reheat. fur.; 60" 3-h. 1-st. universal plate, with top and bottom rolls 36" x 84". Convertible by removing vertical rolls into

sheared plate mill. Fuel, producer and coke oven gas. Annual cap., 125,000 tons universal plates 20" to 60" wide, and sheared plates to 78" wide.

Axle Mill: blt. 1909-10, f. o. July 29, 1910; cont. heat. fur.; 26" 4-st. rolling mill; 6 hammers (7,500-lb.); cutting off, centering machines, and lathes. Fuel, producer and coke oven gas. Product: railway car and locomotive axles. Annual cap., 120,000 tons.

Merchant Mills: 18" (blt. 1909, f. o. Dec. 15, 1909) with 18" 2-h. 5-st. and 18" 3-h. 2-st.; 14" (blt. 1909-10, f. o. Apr. 1, 1910) with 14" 2-h. 5-st. and 14" 3-h. 2-st.; 12" No. 1 (blt. 1910-11, f. o. Mar. 7, 1911) with 14" 2-h. 4-st. cont., 12" 2-h. 2-st. and 12" 3-h. 2-st.; 12" No. 2 (blt. 1910-11, f. o. Aug. 29, 1911) with 14" 2-h. 5-st. cont. and 12" 2-h. 4-st. looping; 10" (blt. 1910-11, f. o. June 5, 1911) with 12" 2-h. 6-st. cont., 10" 2-h. 6-st. looping. Product: structural and agricultural shapes, tie plate bars, bars, flats, rounds and various bar sections. Annual cap., 550,900 tons. Joliet Works, Joliet, Ill.

Blast Furnaces: 4 stacks.

No.	Built	First blown in.	Last rebuilt.	Present size.
1	1873	June 9, 1880	—	78' 4" x 19' 6"
2	1873	Feb. 8, 1882	1891	78' 4" x 19' 6"
3	1903	Jan., 1904	—	84' x 22'
4	1906	Sept. 2, 1906	—	90' x 22'

Four 2-pass side combustion, four 2-pass central combustion, four 4-pass and four 3-pass McClure stoves; 7 steam blowing engines; 2 Heyl & Patterson double-strand casting machines. (Old No. 3 stack, 78' 6" x 19' 5", blt. 1889-90, dismantled in 1905.) By-product coke; Lake ore. Product: Bessemer pig iron, annual cap., 638,000 tons.

By-product coke plant; 280 Koppers ovens, annual cap., 1,075,800 tons. By-product recovery plant and benzol plant.

Steel Works and Rolling Mills: blt. 1870; 3 Bessemer converters (one 12-ton, two 10-ton); first blow Jan. 26, 1873, first steel rail rolled Mar. 15, 1873; 1 Heroult electric fur. (4-ton), f. o. June 20, 1913, used to melt ferro-manganese only; 36" 3-h. blooming, 25" 3-h. roughing and 24" 3-h. finishing trains with 5 heat. fur.; Garrett rod mill with 18" 2-h. 6-st., 16" 2-h. 1-st., 12" 2-h. 3-st., 10" 2-h. 4-st., 9" 2-h. 4-st.; Garrett rod mill with 18" 2-h. 6-st., 16" 2-h. 1-st., 14" 2-h. 3-st., 11" 2-h. 4-st., 10" 2-h. 4-st.; continuous rod mill with 18" 2-h. 6-st. and 11" 2-h. 5-st.; 18" 3-h. and 12" 3-h. merchant mills. Splice bar and rail joint shops. Bolt, nut and washer dept. Foundry, annual cap., 5,000 tons brass, iron and steel castings for own use. Fuel, coal, prod. gas, and oil. Product and annual cap., 690,000 tons Bessemer ingots; 620,900 tons billets; 252,000 tons wire rods;

82,500 tons spike rods; angle bars, joints and splices, 132,000 tons; tie plates, 15,600 tons; base plates, 3,600 tons; spikes, 75,000 tons; bolts, 16,500 tons; nuts, 7,000 tons; screw spikes, 4,500 tons.

Milwaukee Works, Milwaukee, Wis.:

Bay View Furnaces: 2 stacks; No. 1, blt. 1870, f. o. April, 1870, 66' x 16'; No. 2, blt. 1870-71, f. o. April, 1871, 66' x 16'; 6 Massicks & Crooke stoves; 5 steam blowing eng. Coke; Lake and Iron Ridge ore. Product: basic, malleable, forge and foundry pig iron, annual cap., 103,400 tons.

Rolling Mills: blt. 1868 and 1874, remod. 1895-96 and 1905-06; 10 gas-fired cont. heat. fur.; 22" 2-h. 3-st. bar mill; 21" 2-h. 5-st. bar mill; 12" merchant mill with 16" 2-h. 2-st. roughing and 12" 2-h. 4-st.; 9" merchant mill with 14" 2-h. 2-st. roughing and 9" 2-h. 5-st. finishing; 9" merchant mill with 12" 2-h. 2-st. roughing and 9" 2-h. 5-st. finishing; 8" merchant mill with 12" 2-h. 5-st. cont. roughing, and 8" 2-h. 6-st. finishing. Fuel, coal, blast furnace and prod. gas. Machine shop for own use. Product and annual cap.: 210,000 tons merchant bars, 20,000 tons structural shapes, 1,000 tons light rails, 2,000 tons tie and slide plates, 3,000 tons splices.

North Works, Chicago, Ill.:

Blast furnaces, see 1908 Directory, p. 25, and 1912 Supplement, p. 8, were dismantled in 1911. Steel supply plant and warehouse, see below under storage warehouses.

South Works, South Chicago, Ill.:

Blast Furnaces: 11 stacks as follows:

No.	Built	Blown in	Last rebuilt	Present size	Hot blast stoves	
					No.	Size Kind
1	1880-81	June, 1881	1906-07	90' x 22'	4	21' x 107' 11" Cowper
2	1880-81	June, 1881	1907	90' x 22'	4	21' x 107' 11" Cowper
3	1880-81	1882	1906	90' x 22'	{ 1	21' x 107' 11" Cowper
					{ 3	21' x 90' Cowper
4	1880-81	1882	1907-08	90' x 22'	{ 3	21' x 107' 11" Cowper
					{ 1	21' x 95' Cowper
E	1905-06	June 21, '06	—	90' x 22'	4	25' x 90' Whitwell
5	1890-91	May, 1891	1910	94' x 21' 3"	4	21' 11" x 92' 6" Massicks & Crooke
6	1890-91	May, 1891	1908	95' 3" x 21'	4	21' 11" x 92' 6" Massicks & Crooke
7	1890-91	July, 1891	1908-09	94' x 22'	4	21' 11" x 92' 6" Massicks & Crooke
8	1890-91	Jan., 1892	1908-09	95' 3" x 21' 3"	4	21' 11" x 92' 6" Massicks & Crooke
9	1900-01	July 3, 1901	1909	99' 3" x 22'	4	25' x 100' Whitwell
10	1900-01	Dec. 3, 1901	1907-08	95' x 22'	5	25' x 100' Whitwell

Three of the furnaces are thin-lined; 31 blowing eng. (25 steam, 6 gas); 6 Heyl & Patterson double-strand casting machines; 3

slag granulating pits serve 6 furnaces, 5 furnaces granulate directly into cars; one rotary sintering kiln, annual cap., 58,400 tons. By-product coke; Lake ore (Brazilian and Caucasian ores for ferro-manganese and spiegel). Product: Bessemer and basic pig iron, spiegeleisen, ferro-manganese and ferro-silicon; annual cap., 1,897,500 tons.

Bessemer Dept.: blt. 1881-82; 3 Bessemer converters (15-ton); first blow June 14, 1882; 2 mixers (300-ton). Annual cap., 828,000 tons Bessemer ingots.

Open Hearth Depts.: No. 1, blt. 1894-95, f. o. Feb. 11, 1895; 12 B. O. H. fur. (six 50-ton, six 40-ton Siemens stationary); 1 mixer (300-ton). No. 2, blt. 1904-06, f. o. Dec. 27, 1904; 14 B. O. H. fur. (50-ton Siemens stationary); 1 mixer (250-ton); 3 waste heat boilers. Fuel, producer gas. Annual cap., 1,200,000 tons open hearth ingots.

Electric Furnace: 1 Heroult electric fur. (15-ton) used for refining molten metal, blt. 1909, f. o. May 7, 1909; annual cap., 34,400 tons ingots.

Rolling Mills: Slabbing Mill, blt. 1898-99, f. o. Mar. 16, 1899; 40" 2-h. 1-st. reversing mill with vertical rolls; 8 soaking pits. Annual cap., 420,000 tons blooms, billets and slabs.

Sheared Plate Mill: blt. 1894-95, f. o. Feb. 12, 1895; 34" x 90" and 36" x 132" sheared plate mills with 4 heat. fur. Annual cap., 200,000 tons sheared plates to 124" wide and $\frac{3}{16}$ " to 2" gauge.

Universal Plate Mill: blt. 1906-07, f. o. July 25, 1907; 30" 2-h. universal plate mill with 2 heat. fur. Annual cap., 105,000 tons universal plates, 6" to 30" wide and $\frac{3}{16}$ " to 2" gauge.

Rail Mill No. 1: blt. 1881-82, first rail rolled, June 14, 1882; 27" rail mill with 40" 3-h. 1-st. blooming, 27" 3-h. 3-st. and 27" 2-h. 1-st. finishing; 24 soaking pits. Annual cap., 250,000 tons rails, 168,100 tons billets, 140,000 tons sheet bars.

Rail Mill No. 2: blt. 1906-07, f. o. Nov. 4, 1907, 24" 3-h. 3-st. light rail mill, 3 cont. heat. fur.; annual cap., 120,000 tons light rails and small billets.

Blooming Mill No. 1: blt. 1904-05, f. o. Feb. 1, 1905; 40" 2-h. 1-st. reversing blooming mill; 6 soaking pits; annual cap., 480,000 tons billets, blooms and unfinished structural shapes.

Blooming Mill No. 2: blt. 1906-07, f. o. May 1, 1907; 35" 2-h. 1-st. reversing blooming mill; 4 soaking pits. Annual cap., 300,000 tons billets, blooms and unfinished structural shapes.

Structural Mill No. 1: blt. 1905, f. o. Nov. 1, 1905; 32" 2-h. 1-st. roughing, 28" or 30" 3-h. 2-st. and 28" or 30" 2-h. 1-st. finishing; 3 heat. fur. Annual cap., 360,000 tons structural shapes, including angles 3" x 5" to 8" x 8"; beams 9" to 24"; channels, 9" to 15"; zees, 4" to 6"; and rounds, 4 $\frac{1}{4}$ " to 6 $\frac{1}{2}$ ".

Structural Mill No. 2: blt. 1910-11, f. o. Oct. 28, 1911; 24" 2-h.

4-st. and 24" 3-h. 1-st roughing, 21" 2-h. 2-st. and 21" 3-h. 1-st. finishing; 2 heat. fur. Annual cap., 180,000 tons structural shapes; beams, 4" to 8"; channels, 4" to 8"; angles, 3" x 3" to 5" x 4"; zees, 4" to 5"; rounds, 3" to 4"; also various rail joint bars and splice bars, 9 lb. to 19 lb. per ft.

Foundries: Steel foundry has 1 A. O. H. fur. (25-ton), f. o. June, 1904; annual cap., 13,200 tons. Fuel, coal tar. Gray iron and brass foundries. Annual cap., 8,400 tons acid ingots, 3,600 tons castings, 2,400 tons steel rolls, 3,600 tons gray iron castings, 158,400 tons molds and stools, 180 tons brass castings for own use.

Union Works, Ashland Ave. and 31st. St., Chicago, Ill.

Blast Furnaces: 2 stacks; 73' x 15' 4"; No. 3, blt. 1881, f. o. May 2, 1881, rebt. 1889; No. 4, blt. 1881, f. o. May, 1882, rebt. 1889; 7 Siemens-Cowper-Foote stoves. Conn. and Pocahontas coke; Lake ore (foreign and other ore for spiegel, etc.). *Last active in 1910.* Product: Bessemer pig iron, spiegeleisen and ferro-manganese; annual cap., 96,600 tons.

Total annual cap. (including Gary plant): 4,046,700 tons pig iron, spiegeleisen and ferro-manganese; 3,360,000 tons open hearth ingots; 1,518,000 tons Bessemer ingots; 34,400 tons electric steel ingots; 3,509,000 tons blooms, billets, slabs and sheet bars; 1,137,300 tons standard rails, 120,000 tons light rails or small billets, 430,000 tons plates, 252,000 tons wire rods, 82,500 tons spike rods, 1,560,600 tons structural shapes, merchant bars, tie plate bars, rail joints, etc.; 120,000 tons axles, 75,000 tons spikes, 16,500 tons bolts, 7,000 tons nuts, 4,500 tons screw spikes.

STEEL SUPPLY PLANTS AND STORAGE WAREHOUSES

North Works, Chicago, Ill.: Plant for cutting to size and distributing steel from warehouses; annual cap., 120,000 tons. Warehouses with storage cap. of 35,000 tons.

St. Louis Warehouse, 21st and Gratiot Sts., St. Louis, Mo.: Annual cap. for cutting to size and distributing, 20,000 tons. Warehouses have a storage cap. of 8,000 tons.

St. Paul Warehouse, Twin City Plant, University Ave. and Eustis St., St. Paul, Minn.; annual cap. for cutting to size and distributing, 30,000 tons. Warehouses have a storage cap. of 13,000 tons.

Imperial Steel Co. (The), see 1908 Directory, p. 360, formerly-owned Biesecker Steel Mills, at Chagrin Falls, Ohio. Receiver appointed July 27, 1908. Plant purchased by Auto and Motor Castings Co., of Valley City, Ohio, in 1910. Steel furnaces dismantled in 1911.

INDIANA ROLLING MILL CO., New Castle, Ind.

Org. and inc. 1902. Capital stock: com. auth., \$400,000; issued, \$386,000.

C. W. Mouch, P., T., G. M. & P. A.; E. H. Bundy, V. P.; J. T. Myler, Sc.; H. A. Lincoln, A.; Fred Distelrath, G. S.; J. A. Henry, G. S. M.

Selling agents:

Chattanooga, Tenn., Wm. S. Taylor Co.

Fort Worth, Texas, J. G. Thompson.

New Orleans, La., John C. Brill.

New York, 113 Chambers St., John H. Graham & Co.

Richmond, Va., Southern Steel Products Co.

San Francisco, Cal., C. W. Pike Co.

Works at New Castle: blt. 1902-3; f. o. June 1, 1913; 2 4-d. billet heat. fur., 2 pair and sheet fur.; 3 trains (22" 3-h. 2-st. bar, 22" plate and 22" finishing plate mill). Fuel, prod. gas. Department for the manufacture of shovels is connected with the works; also a department for the manufacture of harrow and grain drill discs up to 20" diam. Machine shop for own use.

Product: merchant bars and high carbon sheet steel for shovel plates. Annual cap., 8,000 to 10,000 tons.

INDIANA STEEL CO., 208 South LaSalle 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.

Indiana Steel & Iron Co., see Linton Rolling Mill Co.

INDUSTRIAL WORKS, Bay City, Mich.

Org. 1873, inc. July 21, 1904. Capital stock: \$250,000.

Wm. L. Clements, P.; Ernest B. Perry, V. P. & G. M.; Charles R. Wells, Sc. & T.; Lewis G. Howlett, G. S.; G. L. Harman, A. P.; Benjamin Dixon, G. S. M.; S. J. McMartin, P. A.

Selling agents:

Birmingham, C. B. Davis Engineering Co.

Los Angeles, Cal., N. B. Livermore & Co.

Montreal, F. H. Hopkins & Co.

New York, 50 Church St. (branch office).

Philadelphia, Widener Bldg., Wm. L. Brown.

Portland, Ore., Northwestern Equipment Co.

St. Louis, J. G. Miller.

San Francisco, N. B. Livermore Co.

Seattle, Northwestern Equipment Co.

Works at Bay City: org. blt. 1873; one Tropenas converter (2-ton); construction commenced Nov. 1, 1911; f. o. Mar., 1912. Fuel, coke. Foundry and machine shop for own use.

Product: carbon and vanadium steel castings for own use in the manufacture of railway wrecking cranes, pile drivers, steam and

electric locomotive cranes, transfer tables, etc. Annual cap., 2,500 tons steel castings.

INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill.

Org. and inc., 1893. Capital stock: com. auth., \$10,000,000, issued \$9,998,100; bonds \$5,600,000 on Dec. 31, 1914.

Alexis W. Thompson, P.; P. D. Block, V. P.; G. H. Jones, V. P. & G. S. M.; R. J. Beatty, V. P.; L. E. Block, V. P. & T.; E. M. Adams, Sc.; W. D. Truesdale, A.; at Chicago, Ill. E. J. Block, P. A.; at Indiana Harbor, Ind.

Selling agents:

Denver, Col., 1618 Stout St., The John S. Worthington Co.

Milwaukee, Wis., Majestic Bldg., C. M. Easterly.

St. Louis, Mo., Natl. Bank of Commerce Bldg., O. P. Blake, S. M.

St. Paul, Minn., Pioneer Bldg., B. C. Bradford.

Brand: "Inland" for pig iron; "Inland" in a diamond for rolled products; "Vismara" steel sheets.

Product: basic pig iron, ingots, billets, slabs, sheets, steel roofing, light plates, angles, tees, I beams, channels, agricultural shapes, harrow steel, cultivator attachments, cross arm braces, spikes, bolts, nuts and rivets.

Madeline Furnaces, Indiana Harbor, Ind.: 2 stacks, Furnace No. 1, 85' x 19½', blt. 1906-7; f. o. Aug. 30, 1907; Furnace No. 2, 90' x 20½', blt. 1911-12; construction commenced Feb., 1911, f. o. April 3, 1912; 4 Kennedy fire-brick stoves, 93' x 22', and 5 2-pass side-combustion stoves, 93' x 25'; 8 steam blowing eng.; 16 Sterling water-tube boilers, 8,000 H. P. By-product coke; Lake ore. 1 Heyl and Patterson single-strand casting machine. Sintering plant, annual cap., 40,000 tons. Molten metal is used in O. H. fur. at Indiana Harbor Works. (Formerly called Inland Furnace). Product: basic and foundry pig iron, annual cap., 300,000 tons.

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, harrow teeth, cultivator attachments, and cross-arm braces. Annual cap., 30,000 tons of bar steel, and 1,500 tons of harrow teeth.

Indiana Harbor Works, Indiana Harbor, Ind.: blt. 1901-02; first steel made July 21, 1902; first products rolled, Nov. 1, 1902; 12 B. O. H. fur. (50-ton), adding 8 B. O. H. fur. (75-ton), annual cap., 500,000 tons; 24 soaking pits (cap. 96 ingots); 36" 2-h. 1-st. blooming, 24" 3-h. 3-st. sheet bar mill, 24" 2-h. 4-st. bar, 16" to 8" 2-h. 11-st. cont. bar mill; universal plates, 6¼" to 22" wide, ¼" to 2" thick, rolled on 24" bar mill; adding 28" structural

mill; 90" 3-h. 1-st. sheared plate mill, f. o. Oct. 21, 1913; 2 Laughlin prod. gas heat. fur.; 2 jobbing mills, 27" x 56", 28" x 60"; 2 open annealing fur.; 11 black sheet mills; 11 pair and sheet fur.; 5 hot black plate mills; 5 pair and 5 sheet fur.; 7 cold black sheet mills; 18 box annealing fur.; 1 Mesta pickling machine; 8 galvanizing pots, annual cap., 60,000 tons. Fuel, prod. and coke oven gas. Machine shop for own use. Product: ingots, billets, slabs, sheets, steel roofing, light plates, angles, I beams, channels, shafting, universal plates, merchant bars, tie plates, sheared plates, nuts, rivets, bolts and spikes. Annual cap., 500,000 tons ingots, 100,000 tons of universal plates and structurals on 24" bar mill, 75,000 tons sheared plates, 85,000 tons of sheets, and 100,000 tons of bars.

COAL, COKE, AND IRON ORE PROPERTIES.

The Inland Steel Co. controls the Inland Coal and Washing Co. which owns 200 acres of coal lands at DeSoto, Jackson Co., Ill.

It also owns a by-product coke plant at its Madeline Furnaces, consisting of 86 Koppers ovens, by-product recovery plant and benzol plant. Annual cap., 360,000 net tons of coke.

The company also owns the Laura and Grace Mines, near Hibbing on the Mesabi Range, and Armour No. 1, Armour No. 2 and Thompson Mines on the Cuyuna Range. Annual cap., 800,000 tons.

Inland Steel Casting Co., Terre Haute, Ind., see 1910 Supplement, p. 27, built crucible steel casting plant with 6-pot furnace in 1909, Crucible furnaces dismantled in Dec., 1913, and replaced by air furnaces. J. Warren Ijams appointed receiver, Dec. 7, 1915.

INTERNATIONAL HIGH SPEED STEEL CO., 99 Nassau St., New York. W. G. Fisher, P.

Erecting works at Rockaway, N. J. Will install one 6-ton Heroult electric fur. Will make tool steels, alloy steels, high speed steels, rock drill steels, etc.

INTERNATIONAL STEAM PUMP CO., 115 Broadway, New York, N.Y. Inc. Mar. 8, 1899. C. Phillip Coleman, receiver.

In connection with its Snow Steam Pump Works at Buffalo, N. Y., the company operates a steel casting plant.

Snow Steam Pump Works, Buffalo: Steel Casting Dept.; one 5-ton Tropenas converter added 1902; first steel made Dec., 1902; 3 cupolas. Fuel, coke and oil. Product: steel castings for own use in manufacture of steam, gas and oil pumps and engines, hydraulic machinery, etc.; annual cap., 425 tons.

Inter-Ocean Steel Co., see 1910 Supplement p. 28, 1912 Supplement p. 46; works at Chicago Heights, Ill., acquired Oct. 2, 1911, by the Railway Steel-Spring Co.

INTERSTATE IRON AND STEEL CO., 38 South Dearborn St., Chicago, Ill.

Org. Mar. 28, 1905; inc. Mar. 30, 1905. Capital stock: com., \$400,000.

Silas J. Llewellyn, P., G. M. & G. S. M.; Geo. F. Davie, V. P., T. & P. A.; J. E. Russell, A. & Acting Sec.; at Chicago, Ill. O. O. Bell, Works M. at Cambridge, Ohio. Paul Llewellyn, Works M. at East Chicago, Ind.

Selling agents:

Cleveland, Ohio, J. E. Rawson.

Detroit, Mich., Geo. W. House.

Kansas City, Mo., Geo. M. Rider.

Louisville, Ky., A. & C. B. Robinson.

Pittsburgh, Pa., H. F. Gilg.

St. Paul, Minn., Paul J. Kalman.

Product: iron and steel bars and small structural shapes, iron tie plates, twisted steel squares, Bessemer steel angles, flats, rounds, U bars, channel flats, concrete bars, etc.

East Chicago Works, East Chicago, Ind.: blt. 1900 and f. o. July, 1900; 10 single puddling and busheling fur., 3 double puddling fur., 8 heat. fur. (4 4-d. 4 5-d.); 2 squeezers; 5 trains (20" 3-h. 3-st. puddle; 8" 3-h. 5-st. Belgian with 12" roughing; 9" 3-h. 5-st. Belgian with 12" roughing; 16" 3-h. 3-st.; 22" 3-h. 3-st.). Fuel, coal. Product: iron and steel bars and small structural shapes, iron tie plates, and twisted steel squares. Annual cap., 125,000 tons.

Cambridge Works, Cambridge, Ohio: blt. 1901, f. o. that year; destroyed by fire in July, 1915.

Marion Works, Marion, Ohio: new works under construction to be completed in March, 1916: 1 coal-fired Lauth cont. heat. fur.; 16" 3-h. 3-st. bar mill; 14" 3-h. 7-st. bar mill. Product: Bessemer steel squares, angles, flats, rounds, U bars, channel flats, concrete bars, etc. Annual cap., 36,000 tons.

Interstate Steel Co., see 1908 Directory, p. 296, formerly owned sheet mill plant at Brackenridge, Pa., absorbed by Allegheny Steel Co., June 1, 1909.

Iron and Steel Products Co., Philadelphia, 1912 Supplement, p. 15, see under Bristol Iron and Steel Co., West End Iron Co., Hollidaysburg Iron and Nail Co., and Canton Iron and Steel Co.

Iron and Steel Products Co., Sand Springs, Okla., formed to operate under lease the works of the Pioneer Iron and Steel Co. Operated for a few months only.

Iron Clad Manufacturing Co., see 1908 Directory, p. 470, owned tinning plant in Brooklyn, N. Y.; went into hands of receiver May 23, 1911. Machinery and equipment sold in 1914.

Irondale Furnace Co. (The), see 1908 Directory, p. 403, acquired by the Western Steel Corporation, Nov. 15, 1909. Irondale Furnace now owned by Pacific Coast Steel Co.

Iron-ton Iron Co. (The), see 1908 Directory, p. 364. This company was absorbed by The Marting Iron and Steel Co., Sept. 1, 1912.

IROQUOIS IRON CO., 3267 E. 95th St., South Chicago, Ill.

Org. Mar. 1899; inc., Apr. 1899. Capital stock: \$5,000,000; bonds, \$1,916,000; debentures, \$600,000.

M. Cochrane Armour, P.; Charles A. Stillman, 1 V. P. & T.; E. L. Billingslea, 2 V. P. & G. S. M.; at 1517 Corn Exchange Bldg., Chicago. D. B. Meacham, Ch.; at Cincinnati. Edwin Raum, Sc., A. T., & P. A.; E. L. Ives, Furnace M.; P. Rule, G. S.; at South Chicago.

Selling agents: Rogers, Brown & Co.

Brands: "Iroquois" for strong iron, "Sterling Scotch" for soft iron, "Peerless" for high-silicon soft iron and "Malleable" for iron suited for malleable work.

Furnaces at 95th St. & Calumet River and 94th St. and Lake Michigan: 4 stacks: Furnace A, 76' x 17½', blt. 1890-91, f. o. Sept. 21, 1891; 4 Kennedy central combustion stoves, 85' x 18'. Furnace B, 85' x 18½', blt. 1900-01, f. o. Jan. 27, 1902; 4 Kennedy central combustion stoves, 93½' x 18'. Furnaces C & D; 85' x 21'; blt. 1910-12; f. o. July 30, 1912, and May 13, 1912, respectively; 8 Kennedy stoves, 102' x 22'; 9 steam blowing eng. (216,000 cfm.); 25 water-tube boilers, 11,300 H. P.; 1 double-strand American casting machine; 1 slag gran. pit; 1 slag granulating trough. Coke; Lake ore.

Product: foundry, chill-cast basic and chill-cast malleable pig iron, annual cap., 460,000 tons.

Ivanhoe Furnace Co., see Carter Iron Co.

IVINS' (ELLWOOD) TUBE WORKS, Oak Lane Station, Philadelphia, Pa.

Ellwood Ivins, Proprietor; Samuel Clark, G. S. M.

Sales office: Chicago, Ill., 13-17 W. Jefferson St.

Works at Oak Lane: blt. 1893; f. o. 1894; 4 forge fires; 4 heat. fur.; 2 trains (21"). Fuel, bituminous coal.

Product: blanks for own use for seamless drawn steel tubes; also tool steel tubes. Annual cap., 500 tons of blanks.

JACKSON IRON AND STEEL CO. (The), Jackson, Ohio.

Org. Aug. 6, 1906; inc. Aug. 13, 1906. Capital stock: com. auth., \$300,000, issued, \$250,000.

Simon Labold, P.; at Portsmouth, Ohio. D. D. Davis, V. P.; at Oak Hill, Ohio. J. F. Morgan, Sc., T. & A.; J. G. Morgan, G. S.; J. S. Morgan, G. S. M. & P. A.; at Jackson, Ohio.

Selling agents: Pickands, Mather & Co.; M. A. Hanna & Co.; Crocker Brothers; and Hickman, Williams & Co.

Brand: "Jisco."

Jisco Furnace, Jackson, O.: 1 stack, 75' x 17'; construction commenced Nov. 12, 1906; completed and blown in, Oct. 6, 1908; 4 Amsler hot-blast stoves, 75' x 18'; 2 steam blowing eng.; 4 water-tube boilers, 1,600 H. P. West Va. coke and native raw coal. Lake and local ore. Machine shop for own use.

Product: Jackson County silveries and Bessemer ferro-silicon, annual cap., 36,000 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, Sc. & T.; 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.); 2 trains, 22" 3-h. 2-st. bar, 12" 3-h. 5-st. guide. Fuel, bituminous coal.

Product: bar iron and steel, twisted square concrete bars, annual cap., 20,000 tons.

Jefferson Iron Co.

Jefferson Furnace at Jefferson, Texas: 1 coke stack, see 1908 Directory, p. 353, was acquired by Dallas, Coal, Iron and Steel Co. The furnace was last active in 1909 and has been abandoned and practically dismantled. Real estate said to be now owned by American Iron and Steel Co., Houston, Texas.

JEFFERSON IRON CO. (The), Oak Hill, Ohio.

Org. and inc. 1899. Capital stock: \$20,000.

John J. Thomas, P.; Joseph J. Jones, Sc., T., G. M. & P. A.

Selling agent: Rogers, Brown & Co.

Brand: "Anchor."

Jefferson Furnace, Oak Hill: 1 stack, 40' x 10½', blt. 1854; warm blast; 1 steam blowing eng.; 2 cylindrical boilers, 80 H. P. Charcoal; local ore. Company owns block iron ore mine 1 mile from furnace, annual cap., 4,000 tons; also limestone quarry.

Product: charcoal foundry pig iron, annual cap., 3,500 tons.

JENIFER IRON AND COAL CO., Milwaukee, Wis.

Capital stock: \$150,000; bonds, \$300,000.

J. M. Thomas, P.; J. M. Riebs, V. P.; Fred Hoffman, Sc.

Jenifer Furnace, Jenifer, Ala.: 1 stack, 75' x 16', blt. 1901; f. o. Sept. 26, 1901; 1 improved Whitwell and 2 Hugh Kennedy stoves; 3 steam blowing eng. (30,000 cfm.); 9 boilers (1 water-tube and 8 flue) 1,600 H. P. Coke; local brown ore. Company owns iron ore mine at Jenifer; limestone quarries; and 100 coke ovens at Aubrey, Ala., with an annual cap. of 50,000 net tons of coke.
Last active in 1903.

Product: foundry and gray forge pig iron, annual cap., 50,000 tons.

JESSOP STEEL CO., 91 John St., New York, N. Y.

Sydney J. Robinson, P.; at Sheffield, England. W. F. Wagner, V. P.; W. H. Morton, T.; J. A. Graham, A. T.; at New York. S. A. Grayson, G. M.; J. T. Wood, Sc.; at Washington, Pa.

Works at Washington, Pa.: blt. 1901-02, first steel made Nov. 13, 1902, first rolled products, Dec. 5, 1902; 3 36-pot crucible fur.; 2 regen. heat. fur., 6 coal heat. fur., 5 annealing fur. (4 coal, 1 gas); 1 forge fire; 2 trains (20" 4-st., 24" 3-st.).

Product: crucible ingots for own use, annual cap., 10,000 tons; sheet and saw steel, annual cap., 6,000 tons.

Job Iron & Steel Co. leased the works of the Ashland Sheet Mill Co., Ashland, Ky., April 15, 1908 and operated the works until succeeded by the Fannin & McCullough Sheet Mill Co. in 1912.

Johnson, Emma L., Fullerton, Pa., see 1908 Directory, p. 262, owns Catasauqua Steel Works, Catasauqua, Pa. Machinery sold and removed in 1914. Buildings and site for sale.

JOHNSON (ISAAC G.) AND CO., Spuyten Duyvil, New York, N. Y.

Org. 1853; inc. 1902.

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); 2 added 1903; 2 in 1912; first converter steel made June 1, 1903; 4 cupolas. Fuel, coal. Machine shop for own use. Crucible steel fur. erected 1880, dismantled.

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.

Joliet Iron Products Co., see 1908 Directory, p. 386. Works acquired May 1, 1911, by the Joliet Rolling Mill Co.

Joliet Rolling Mill Co. acquired plant of Joliet Iron Products Co., May 1, 1911. Works acquired by Frederick Cowin & Co., Inc., March 1, 1913.

Joliette Steel and Iron Foundry, Ltd., built a converter steel casting plant at Joliette, P. Q., Canada, in 1910-11. Plant destroyed by fire Feb. 1, 1914, and abandoned.

JONES AND LAUGHLIN STEEL COMPANY, Pittsburgh, Pa.

Capital stock: common, authorized and issued, \$30,000,000.

B. F. Jones, Jr., P.; Willis L. King, V. P. & G. S. M.; Wm. Larimer Jones, V. P. & G. M.; W. C. Moreland, Sc.; Chas. A. Fisher, T.; J. C. Watson, A. Sc. & A. T.; W. J. Creighton, A.; F. W. Ochsenhirt, Jr., P. A.

Branch office and warehouse: Chicago, Ill., Lake and Canal Sts.

District sales offices:

Boston, 131 State St.

Buffalo, White Bldg.

Cincinnati, Union Trust Co. Bldg.

Cleveland, Rockefeller Bldg.

Detroit, Penobscot Bldg.

New York, City Investing Bldg.

Philadelphia, Commercial Trust Bldg.

Pittsburgh, Jones & Laughlin Bldg.

Saint Louis, Pierce Bldg.

San Francisco, Crocker Bldg.

Product: 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; tinplate and black sheets (tin mill sizes); chains, 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.

Works: Pittsburgh Works, Pittsburgh, and Aliquippa Works, Woodlawn, Beaver Co., Pa.

JONES MANUFACTURING CO. (THE D. F.), Gananoque, Ont., Canada.

W. Wallace Jones, P.; at Toronto. W. T. Sampson, V. P. & G. M.; Ford Patch, Sc. & T.; David Bain, G. S.; C. A. Watt, G. S. M.; at Gananoque.

Selling agents: Montreal, F. Bacon & Co.; St. John, N. B., H. G. Rogers; Winnipeg, David Philip.

Works at Gananoque (operated under the Ontario Steel Products Co., 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 AND COKE CO., Perry-Payne Bldg.,
Cleveland, Ohio.**

Price McKinney, P.; James W. Corrigan, V. P.; J. E. Ferris, Sc.
& T.; W. G. Smith, S.

Selling agents: Corrigan, McKinney & Co.

Brand: "Josephine."

Josephine Furnaces at Josephine, Pa.: 2 stacks. No. 1, 80' 3" x 20';
blt. 1906-07; f. o. Jan. 14, 1907; No. 2, 80' 3" x 20' 3"; blt.
1907-12; f. o. Aug. 14, 1912; 8 McClure stoves, 90' x 21'. Coke;
Lake ore.

Product: Bessemer, malleable, foundry, forge and basic pig iron,
annual cap., 280,000 tons.

JOYCE CRIDLAND CO. (The), Dayton, Ohio.

Org. and inc. Nov. 23, 1893. Capital stock: \$75,000.

F. I. Joyce, P. & T.; T. H. Cridland, V. P. & G. S.; George W.
Llewellyn, Sc.

Works at Dayton: 3 crucible fur. with 12 pots; first steel made
1900; 1 ham. (800-lb.); 1 hydraulic forging press (100-ton).
Fuel, oil. Machine shop for own use.

Product: crucible steel castings for sale and for own use; also alloy
steel castings; annual cap., 200 tons.

**JUDSON MANUFACTURING CO., 819 Folsom St., San Francisco,
Cal.**

Org. and inc. 1882. Capital stock: com. auth. \$2,000,000, issued
\$1,788,000.

H. E. Bothin, P. & T.; W. H. French, V. P. & G. M.; R. B.
Girdwood, Sc.; at 819 Folsom St., San Francisco. W. O. Bunker,
S.; at Emery, Cal.

Selling agents: Los Angeles, Cal., C. W. Pike Co.; Seattle, Wash.,
A. A. Hilton Co.

Brand: "Judson."

Works at Emery, Cal.: blt. 1882; 5 oil heat. fur.; (1 3-d., 4 4-d.);
4 trains (10" 3-h. 5-st., 10" 3-h. 4-st. guide, 16" 3-h. 3-st., 16" 3-h.
3-st. bar); universal plates rolled on 16" mill, 7" to 24" wide; 1
plate heat. fur.

O. H. Department, 16th & Rhode Island Sts., San Francisco, Cal.:
blt. 1913; f. o. Oct., 1914; 1 40-ton Wellman B. O. H. fur. Fuel,
oil. (Owned by West Coast Iron Co.; leased by Judson Manu-
facturing Co.)

Product: merchant bar iron and steel, structural and agricultural
shapes, bolts and spikes, cold drawn shafting, and iron castings.
Annual cap., 24,000 tons finished iron and steel, 15,000 tons O. H.
ingots, 3,600 tons bolts and spikes, 18,000 tons bridge and struct-
ural work, 1,000 tons cold drawn shafting and 2,000 tons gray
iron castings.

JUNIATA FURNACE AND FOUNDRY CO., 30 West Girard Ave., Philadelphia, Pa.

Org. and inc. July 20, 1891. Capital stock: com. auth., \$200,000, issued, \$119,700; bonds, \$80,000.

Alfred Marshall, P.; Edward E. Marshall, V. P. & G. M.; Edward T. Adams, Sc.; F. Warren Marshall, T.

Selling agents: Philadelphia, Pa., 615 Penna. Bldg., Marshall, Matlack & Co.

Brand: "Marshall" and "Juniata."

Marshall Furnace, Newport, Pa.: 1 stack, blt. 1871, last remod. 1908, 60' x 13', 2 Roberts stoves, 70' x 19'; 2 steam blowing eng.; 3 water-tube boilers, 825 H. P. Coke and anthracite coal; Lake and local ore. Company owns iron ore mine at Dillsburg, Pa.; annual cap., 20,000 tons of ore.

Product: foundry pig iron, annual cap., 36,000 tons; also spiegel-eisen from zinc residuum.

KANSAS CITY BOLT AND NUT CO. (The), Independence Ave. & Bristol St., Kansas City, Mo.

Org. and inc. Apr. 7, 1887. Capital stock: \$500,000.

M. D. Sternbergh, P.; at Reading, Pa. Solomon Stoddard, V. P. & G. M.; J. Hervey Sternbergh, Sc.; H. R. Warren, T. & P. A.; D. D. Neville, G. S.; C. A. Johnson, G. S. M.; at Kansas City.

Works at Kansas City: blt. 1887-88; f. o. Jan., 1889; 4 heat. fur. (4-d.); 2 trains (16" & 10" comb. 3-h. 7-st., 10" 3-h. 5-st.); 2 ham. (1,500 and 800-lb.). Fuel, oil. Machine shop for own use. Bolt and nut factory. Car forging and blacksmith shop.

Product: merchant bar and bolt iron; reinforcing bars; bolts $\frac{1}{2}$ " to 3"; hot pressed nuts, $\frac{1}{2}$ " to 3"; rivets $\frac{1}{2}$ " to 3"; spikes; lags, rods, boat spikes, railroad forgings, silo hardware, oil well supplies, structural forgings, pole steps, cross arm braces, turn-buckles, hooks, eyes and stubs. Annual cap., 40,000 tons of bar iron, 150,000 kegs bolts, 50,000 kegs nuts, 3,000 kegs rivets, 12,000 kegs of forged spikes and 5,000 tons of other products.

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. *Last active in 1912.*

Product: bars and flats for own use, annual cap., 1,800 tons.

KELLY (G. A.) PLOW CO., Longview, Texas.

Est. 1860; inc. 1882. Capital stock: com., \$90,000; pref. 10%, \$10,000.

R. M. Kelly, P.; Mrs. G. A. Kelly, V. P.; L. D. Kelly, Sc. & T.

Works at Longview: 2 4-pot crucible fur. blt. and f. o. 1905. Fuel, oil. Gray iron foundry. Agricultural implement factory.

Product: crucible steel castings for own use, annual cap., 75 tons. Plows and farming implements for sale.

KELLY NAIL AND IRON CO. (The), Ironton, Ohio.

Org. and inc. Nov. 11, 1882. Capital stock: com. \$300,000.

Oscar Richey, P., G. M., G. S. M., & P. A.; T. J. Hayes, Sc. & T.; at Ironton, Ohio. I. 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; 2 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 1 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.

Kemmerer Iron and Steel Co., see 1908 Directory, p. 276. Iron rolling mill at Scranton, Pa., sold at receiver's sale, June 16, 1908, and bid in by the Scranton Trust Co., acting for the bondholders. Works were dismantled in 1910 and buildings used for other purposes.

KENNEDY & SONS, Ltd. (The WILLIAM), Owen Sound, Ontario, Canada.

Est. 1862; inc. May 6, 1896. Capital stock: com. auth. \$95,000; i. sued \$88,200.

M. Kennedy, Sr., P.; D. J. Kennedy, 1 V. P.; M. Kennedy, Jr., 2 V. P.; D. E. Armstrong, Sec. & T.

Works at Owen Sound, Ontario: blt. 1899-1900, f. o. May, 1900; one 2-ton Tropenas converter. Gray iron foundry and machine shop. Fuel, coke.

Product: machinery and other steel castings from 1 lb. to 6,000 lbs. Annual cap., s. t., 1,200 tons steel and 400 tons gray iron castings.

Works at Collingwood, Ont. (leased): blt. 1901-03; 2 A. O. H. fur.; 2 reverb. ingot heat. fur.; 2 trains (10" 5-st. semi-cont. Belgian; 18" 3-h. 3-st. merchant mills): first products rolled, Sept., 1906. Fuel, coal. Machine shop for own use. (Formerly operated by The Northern Iron and Steel Co., Ltd.) Product: ingots, billets, rounds, squares and flats, wire rods, angles, plow beams, wagon tires, shafting, girders, street rails, mine rails, bolts, rods, hoops, etc. Annual cap., 36,000 tons ingots, 30,000 tons rolled products.

KENNEDY-STROH CORPORATION, Oakmont, Pa.

Org. and inc. Jan. 4, 1915. Capital stock: \$1,600,000; bonds, \$750,000.

Frank B. Bell, P.; J. L. Kendall, T.; at Pittsburgh, Pa. J. E. Kennedy, V. P.; at New York City. O. I. Affelder, A.; R. Bowen, G. S. M.; G. D. Leopold, P. A.; at Oakmont, Pa.

Sales offices: Chicago, 1207 Fisher Bldg.; New York, Equitable Bldg.; Pittsburgh, Farmers Bank Bldg.

The Kennedy-Stroh Corp'n. took over the plants of the Best Mfg. Co. at Oakmont, the Stroh Steel Hardening Process Co. and the Lawrence Steel Casting Co., Pittsburgh, and all the rights, processes and factories of the Kennedy Mfg. & Eng. Co., New York.

The main shops and foundries are at Oakmont, Pa., where the company has open hearth furnaces. The Lawrence Steel Casting Dept. is at 32nd St., Pittsburgh.

Product: mining, crushing, screening, cement and other heavy machinery; Stroh process hardened pinions, gears, sprockets, spindles, coupling boxes, frogs, crossings, and car wheels; "Best" valves, fittings, flanges, fabricated piping, flexible joints, etc.; steel, semi-steel, iron, brass, monel and aluminum castings.

The company operates the following steel casting plants in connection with their other operations:

Best Mfg. Dept., Oakmont, Pa.: 2 A. O. H. fur. (15-ton), blt. 1915, first steel made Dec. 1, 1915. Fuel, nat. gas.

Product: steel castings for own use and for sale, annual cap., 10,000 tons.

Lawrence Steel Casting Dept., 32nd St. & A. V. R. R., Pittsburgh: 1 A. O. H. fur. (10-ton); construction commenced Oct., 1909; first steel made Jan. 29, 1910. Fuel, nat. gas. (Formerly owned and operated by the Lawrence Iron and Steel Foundry Co.; acquired by Lawrence Steel Casting Co., June 6, 1912; acquired by present owners Jan. 1, 1915).

Product: O. H. castings, semi-steel, iron, brass, Monel, and aluminum castings. Annual cap., 2,500 tons of O. H. and 5,000 tons of semi-steel, iron, brass, etc., castings.

Kenton Iron and Steel Co., see 1908 Directory, p. 331. Works at Charleston, W. Va., dismantled in 1912.

Keystone Driller Co., see 1908 Directory, p. 305, projected Bessemer converter abandoned.

Keystone Steel Co., see Wilmington Rolling Mills.

Keystone Steel Casting Co., Chester, Pa., see 1908 Directory, p. 273. Plant sold in July, 1915, and taken over by the Atlantic Steel Casting Co. McHaffie furnaces dismantled in 1909. Crucible furnaces dismantled except 1 8-pot fur. for melting alloys.

Keystone Steel Foundry Co., Avonmore, Pa., reorganized as Kiski Steel Casting Co. in 1912.

Kidd Brothers and Burgher Steel Wire Co., see 1908 Directory, p. 308, projected crucible furnaces abandoned in 1908. Company succeeded by Kidd Drawn Steel Co., June 5, 1914.

Kinsley Iron and Machine Co., see 1908 Directory, p. 233. Plant sold May 27, 1909, and completely dismantled.

Kiski Steel Casting Co., Avonmore, Pa.

Org. and inc. 1912. (Formerly known as Keystone Steel Foundry Co.).

John Weilersbacher, P.; John Sauers, V. P.; at Pittsburgh. W. S. Beamer, Sc. & T.; at Apollo, Pa. Charles Biehl, T.; Tarentum, Pa.

Works at Avonmore, Pa.: blt. 1905-06; 1 A. O. H. fur. (7-ton), blt. 1910; 3-ton Bessemer converter, blt. 1905-6, dismantled 1910. *Idle and for sale.* Product: steel castings.

KITTANNING IRON & STEEL MANUFACTURING CO., Kittanning, Pa.

Org. and inc. July, 1894. Capital stock: \$400,000; bonds, \$36,250.

F. C. Neale, P. & G. S. M.; at Farmers Bank Bldg., Pittsburgh, Pa. Lamont Bixler, Sc.; John D. Galbraith, T.; at Kittanning. Sales office: Pittsburgh, Pa., Farmers Bank Bldg.

Brands: "Rebecca" and "Kittanning."

Product: pig iron and muck bar.

Rebecca Furnace, Kittanning, Pa.: 1 stack, 80' x 18'; blt. 1906-08; f. o. Aug. 12, 1912; 4 McClure stoves, 1 80' x 20', 1 80' x 18', 2 65' x 18'; 4 steam blowing eng. (50,000 cfm.); 6 water-tube boilers, 3,000 H. P.; single-strand Heyl & Patterson casting machine. Coke; Lake ore. Machine shop for own use. (1 stack blt. 1880, dismantled 1908.) Product: basic, malleable, gray forge and foundry pig iron, annual cap., 100,000 tons.

Kittanning Rolling Mill, Kittanning, Pa.: blt. 1848, rebt. 1880; 33 single puddling fur.; 1 heat fur., 22" 3-h. 1-st. muck mill. Fuel, nat. gas. Machine shop for own use. Product: muck bar, annual cap., 20,000 tons.

Company owns 800 acres of gas property in Armstrong County, Pa., containing 15 producing wells with an annual cap. of 150,000,000 cubic feet.

Kloman Mining Co., see 1912 Supplement p. 48, Jones direct process furnaces abandoned in 1914.

KNOXVILLE IRON CO., Knoxville, Tenn.

Org. and inc. 1868. Capital stock: \$300,000; bonds, \$53,500.

T. I. Stephenson, P., G. M., & G. S. M.; O. A. Brown, Sc. & T.; S. McCloud, G. S.; at Knoxville, Tenn.

Selling agent: Louisville, Ky., 331 W. Main St., W. P. Davis.

Works at Lonsdale, a suburb of Knoxville: blt. 1902-03, utilizing a part of the machinery formerly in the company's works at Harri-man and Knoxville; f. o. Mar., 1903; 2 double and 24 single puddling fur.; 7 heat. fur. (2 coal 3-d. and 5 gas 4-d.); 4 trains (20" 3-h. 2-st. muck, 16" 3-h. 2-st. bar, 16" roughing to 9" finishing 3-h. 2-st., 12" roughing to 8" guide finishing 3-h. 1-st.) Fuel, coal and mfd. gas. Machine shop for own use.

Product: merchant bar iron and light sections of angle and channel iron and steel, annual cap., from 40,000 to 50,000 tons.

KOKOMO STEEL AND WIRE CO., Kokomo, Ind.

A. A. Charles, P.; A. V. Conradt, V. P.; J. E. Fredrick, Sc.; G. W. Charles, T.

Works at Kokomo, Ind.: blt. 1900; 2 B. O. H. fur. (80-ton), blt. 1913-14; first steel made Feb. 6, 1914; 2 4-hole soaking pits; 2 trains (34" 2-h. 1-st. reversing blooming, f. o. March 1, 1914; Garrett rod mill); 2 heat. fur.; 106 wire drawing blocks; 85 wire nail mach.; barbed wire and woven fence mach. Fuel, coal. Galvanizing dept. Contemplate erecting one additional B. O. H. fur. (75-ton) which will increase ingot cap. to 135,000 tons.

Product: ingots, billets and wire rods for own use. Wire, wire nails, barbed wire and wire fencing. Annual cap., 95,000 tons ingots, 80,000 tons billets, 100,000 tons wire rods, 67,500 tons wire, 1,000,000 kegs wire nails.

LA BELLE IRON WORKS, Steubenville, Ohio.

Inc. Dec. 3, 1875. Capital stock: com. auth. \$10,000,000, issued \$9,915,400; pref. 8% cum. auth. \$10,000,000, issued \$9,915,400. R. C. Kirk, P.; H. D. Westfall, V. P. & G. S. M.; W. E. Beswick, Sec.; D. A. Burt, T. & A.; G. B. LeVan, G. M.; R. M. Rice, P. A.

Selling agents:

Boston, 452 John Hancock Bldg., George K. Tinker.

Chicago, 1849-50 Peoples Gas Bldg., Wilmer Wickersham.

Kansas City, Mo., 605 R. A. Long Bldg., Hoyle Jones.

Mexico, D. F., Box 1519, C. V. Hitchins.

New Orleans, 608 Tulane Newcomb Bldg., D. M. Montgomery.

New York, 39 Cortland St., A. Schroeder.

New York, 257 Broadway, Ely & Williams Co.

Philadelphia, Land Title Bldg., S. H. Truitt.

Pittsburgh, 1317-18 Oliver Bldg., G. C. Shidle.

Portland, Ore.; Front & Sheridan Sts., J. R. Bowles.

San Francisco, Rialto Bldg., W. A. Taylor.

St. Louis, 1309 New Bank of Commerce Bldg., C. E. Hutchinson.

Brands: "La Belle," "La Belle Blue," "La Belle O. H.," "La Belle Galvanized."

Steubenville Works, Steubenville, Ohio:

La Belle Furnaces: 2 stacks. No. 1, 90' x 20', orig. blt. 1865 and last rebt. 1901-03; No. 2, 90' x 20', blt. 1903-04; f. o. Oct. 31, 1904; 8 Massicks & Crooke stoves, 85' x 21'; 3 steam blowing eng. (105,840 cfm.); 34 water-tube boilers, 15,900 H. P., serve entire works; 2 Heyl and Patterson double-strand casting machines; 1 slag gran. pit for slag sand. Machine shop for own use. Conn. coke; Lake ore. Molten metal to mixer and O. H. fur. Product: basic and foundry pig iron, annual cap., 300,000 tons. By-product Coke Plant: 94 Koppers cross-regenerative ovens, annual cap., 350,000 net tons coke. By-product recovery plant. Building a benzol plant, to be completed about July 1, 1916, annual cap., 800,000 gals.

Steel Works and Rolling Mill: orig. blt. 1855; 11 B. O. H. fur. (50-ton); 20 soaking pits; 1 mixer (300-ton); 2 cont. gas heat. fur.; first steel made July 26, 1902; 46" 2-h. 1-st. reversing blooming and billet mill; 24" universal plate mill with 2 cont. heat. fur.; two 18" skelp mills with 2 cont. heat. fur.; 2 sheared plate mills (84" and 72") with 11 heat. fur.; 2 jobbing plate mills (60" and 68") with 3 pair and sheet fur. and 2 double open annealing fur.; 8 black sheet mills (36" to 44") with 8 comb. pair and sheet fur.; 6 cold mills (46" and 60"); 7 double box

annealing fur.; 2 pickling mach.; 4 galvanizing pots. Fuel, coal, nat. and prod. gas. Roofing plant. Tube mills: 2 lap weld and 2 butt weld furnaces, socket shop and galvanizing dept. Machine shop for own use. Product: universal and sheared plates, skelp, wrought pipe, black and galvanized sheets.

Wheeling Works, Wheeling, W. Va.: orig. blt. 1852; 4 4-d. regenerative gas heat. fur.; 22" 3-h. nail plate, 21" 2-h. nail plate or skelp mill; 119 cut nail machines. Fuel, nat. gas. Machine shop for own use. Product: grooved skelp and nail plate; cut nails and tacks.

Product and total annual cap. both works: 400,000 tons of steel ingots and slabs, 120,000 tons of universal plates, 120,000 tons of flat bars, skelp, and special plates, 35,000 tons of blue annealed plates, 35,000 tons of box annealed plates, 110,000 tons of sheared plates, 40,000 tons of black sheets, 300,000 kegs of cut nails, 100,000 tons of wrought pipe, 12,000 tons of galvanized pipe, and 7,500 tons of iron castings.

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 bee-hive coke ovens at La Belle, Fayette Co., Pa., annual cap., 140,000 net tons of coke.

The company also owns 560 acres of coal lands in Jefferson Co., Ohio, and 4,850 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., developed but idle at present; and 200 acres of undeveloped coal lands in Randolph Co., W. Va.

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.

LACKAWANNA STEEL CO., 2 Rector St., New York, and Lackawanna Bldg., Lackawanna, N. Y.

Inc. Feb. 15, 1902. Capital stock: com. auth., \$60,000,000, issued \$35,000,000 (\$15,000,000 reserved for bond conversion); pref. 7% cum. red. at 115, auth. \$10,000,000, issued \$6,000 (in hands of Treasurer.) Bonds outstanding Nov. 1, 1915, \$31,000,000; bonds of subsidiary companies outstanding Nov. 1, 1915, \$6,198,000.

E. A. S. Clarke, P.; Moses Taylor, V. P.; A. J. Singer, A. P.; at 2 Rector St., New York. C. H. McCullough, Jr., V. P. & G. M.;

J. P. Higginson, T.; F. F. Graham, Sc.; Herbert Melvin, A. T. & A. Sc.; L. W. Hesselman, C.; G. F. Downs, G. S.; C. R. Robinson, G. M. S.; F. H. Burnett, G. P. A.; at Lackawanna, N. Y.

Sales offices:

Atlanta, Candler Bldg., J. E. Franks.

Boston, Marshall Bldg., 40 Central St., H. L. Stevens.

Buffalo, Marine National Bank Bldg., G. A. Hagar.

Chicago, Continental and Commercial Bank Bldg., A. P. Van Schaick.

Cincinnati, Front, Freeman, and Sargent Sts., Cincinnati Iron and Steel Co.

Cleveland, Citizens Bldg., J. C. Chandler.

Detroit, Penobscot Bldg., Jay C. McLauchlan.

New York, 2 Rector St., H. H. Barbour.

Philadelphia, Morris Bldg., W. M. Breeden.

St. Louis, Pierce Bldg., G. C. Holmes.

San Francisco, 22 Battery St., C. W. Pike Co.

Brand: "Lackawanna."

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 plates, merchant bars, shapes, railway spikes, bolts and nuts.

Properties:

Lackawanna Steel Works, Lackawanna, N. Y.

Capital stock of the following companies:

The Lackawanna Iron and Steel Co.

Lackawanna Coal and 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.

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.

Scranton Mining Co., Scranton Mine, Mesabi Range.

Hobart Iron Co., Elba, Minorca, and Yawkey Mines, Mesabi Range.

Corsica Iron Co., Corsica Mine, Mesabi Range.

Ontario Mining Co.

Negaunee Mine, $\frac{1}{2}$ interest in leasehold.

Interest in Cornwall Ore Banks (see under Lackawanna Iron and Steel Co. below).

Lackawanna Steel Works, Lackawanna, N. Y.

BLAST FURNACES.

No.	Built.	Size	Center Combustion Stoves.		First Blast.
			No.	Size	
1	1901-02	87' x 17'	4	83' x 18'	Feb. 11, 1903
2	1901-02	87' x 17'	4	83' x 18'	May 2, 1903
3	1902-04	94' x 22'9"	4	133' x 22'	June 9, 1904
4	1902-05	94' x 22'9"	4	133' x 22'	Jan. 21, 1905
5	1902-05	94' x 22'9"	4	133' x 22'	Sept. 3, 1905
6	1902-06	94' x 22'	4	133' x 22'	May 1, 1906
7	1906-07	94' x 22'	4	109' x 22'	Feb. 12, 1907

Sixteen gas and 6 steam blowing eng.; 138 water-tube boilers, (36,000 H. P.); 3 double-strand Heyl & Patterson casting mach.; 2 rotary sintering kilns (annual cap., 25,000 tons); Schumacher briquetting plant (annual cap., 20,000 tons). Conn. and by-product coke; Lake ore. Molten metal to mixers, thence to converters and O. H. fur. Blast furnace gas used for power.

Product: Bessemer and basic pig iron, annual cap., 1,080,000 tons. (See also under Lackawanna Iron & Steel Co. for furnaces operated by subsidiary.)

By-Product Coke Plant: 469 by-product ovens (188 Otto-Hoffmann; 281 Rothberg). Tar and ammonia house; benzol plant. Annual cap., 700,000 net tons of coke, 2,000,000 gallons light oil.

STEEL WORKS.

Bessemer Department: blt. 1902-03 f. o. Oct. 13, 1903; 4 Bessemer converters (10-ton); 8 iron and 4 spiegel cupolas; 2 mixers (250-ton, 300-ton); fuel, coke.

Open Hearth Department No. 1: blt. 1903-04, f. o. Sept. 26, 1904; 14 B. O. H. fur. (6 60-ton blt. 1903-04; 5 75-ton blt. 1905-06; 1 75-ton blt. 1909-10; 2 75-ton blt. 1911-12); 1 600-ton mixer blt. 1911-12; fuel, producer gas (31 Laughlin and 33 Morgan gas producers.)

Open Hearth Department No. 2: 2 200-ton tilting B. O. H. fur. (blt. 1912-13, f. o. May 29, 1913) for duplex process; 4 100-ton stationary B. O. H. fur.; plans for 4 additional 100-ton fur.; fuel, producer gas (20 Hughes producers, 8 for tilting, 3 for each stationary). Adding 2 B. O. H. fur. (100-ton), annual cap., 120,000 tons.

Product: Bessemer and open hearth ingots; annual cap., 1,600,000 tons.

ROLLING MILLS.

Blooming Mill: blt. 1904-05, f. o. Nov. 27, 1905; 40" blooming mill; 5 4-hole soaking pits; fuel, producer gas (4 Fraser-Talbot,

- 2 Laughlin, 1 Hughes gas producers). Product: billets, annual cap., 300,000 tons.
- Slabbing Mill: blt. 1903-04, f. o. Oct. 16, 1904; 32" mill; 6 soaking pits; fuel, producer gas (Morgan gas producers). Product: slabs, blooms, and billets, annual cap., 240,000 tons.
- Sheet Bar and Billet Mill: blt. 1907, f. o. Dec. 15, 1907; 18" 10 st. cont. mill, fitted with duplicate housings for sheet bars and billets. Product: sheet bars and small billets, annual cap., 170,000 tons.
- Rail Mill: blt. 1902-03, f. o. Oct. 20, 1903; 6 stands 32" rolls; 7 4-hole soaking pits; fuel, producer gas (10 Morgan producers). Product: steel rails, annual cap., 500,000 tons.
- Light Rail and Structural Mills, parallel in same building: blt. 1902-04, f. o. rails July 5, 1904, structural shapes, Sept. 15, 1904; rail mill has 2 stands 24", 1 stand 16" rolls; 4 cont. heat. fur. Product: light rails, structural shapes, splice bars, tie plates, etc., annual cap., 85,000 tons.
- Mill No. 3: blt. 1902-04, f.o. Sept. 15, 1904; 3 cont. heat. furnaces; 24" 3-h. 3-st. structural mill; fuel, producer and coke oven gas for heating furnaces; 16 R. D. Wood and 4 Laughlin producers. Product: structural shapes and sheet piling bars; annual cap., 140,000 tons.
- Plate Mill: blt. 1903-04, f. o. Nov. 5, 1904; 48" universal plate mill; 6 Siemens heat. fur.; fuel, producer gas (Morgan producers). Product: universal plates to 48" wide and sheared plates to 72" wide, annual cap., 150,000 tons.
- Merchant Bar Mill: blt. 1903-05, f. o. Jan. 31, 1905; one 8", 12", and one 16" comb. merchant mill; 2 cont. heat. fur.; fuel, coke-oven and producer gas (4 Morgan producers). Product: bars for car builders, agricultural implement, and bolt manufacturers.
- Merchant Bar Mill: blt. 1911, f. o. Sept. 5, 1911; 1 6-st. 12" cont. roughing train, 4 2-st. 10" finishing mills. Fuel, producer gas (4 Morgan producers). Product: wire rods No. 5 to $\frac{7}{8}$ in., rounds, squares, flats, ovals, half ovals, and other merchant bar shapes. Annual cap. of merchant bar products, 175,000 tons.
- Plan to add 8" 2-h. 14-st. semi-cont. merchant mill, annual cap., 84,000 tons.
- Spike Bolt and Nut Factory: blt. 1912-13, f. o. Mar. 17, 1913; 4 spike mach., 1 bolt header, 3 nut mach., 2 threading mach., tapping and threading machinery; 9 heat. fur. Fuel, oil. Product: railroad track spikes, track bolts, and nuts, annual cap., 19,000 tons.

AUXILIARY DEPARTMENTS.

- Power Plants: No. 1, 8 1,000 H. P. gas engines, motor generators, air compressors, hydraulic pumps, etc.; No. 2 8 2,000 H. P. gas eng. and 6 3,000 H. P. steam blowing eng.; No. 3, 8 2,000 H. P. gas blowing eng.

Pumping Station: daily cap., 105,000,000 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 Munox boilers, 7,000 H. P.; Coke Oven Boiler House, 4 Cahall and one Stirling boiler, 1,400 H. P.; Waste Heat Plant, No. 2 Open Hearth, 6 B. & W. boilers, 1,800 H. P. Total H. P., 46,200.

Machine, forge, boiler bridge, pipe, pattern, carpenter, electrical repair, and roll shops and storehouses. Foundries for iron, steel, and brass castings. Annual cap., 6,000 tons iron castings, 30,000 tons molds and stools, 1,500 tons steel castings, 300 tons brass castings for own use.

Lackawanna Iron and Steel Co., Lebanon, Pa.

Inc., June 4, 1884. Capital stock (practically all owned by Lackawanna Steel Co.), auth. \$25,000,000, issued \$5,135,800.

E. A. S. Clarke, P.; Moses Taylor V. P.; Arthur J. Singer, A. P.; at 2 Rector St., New York. C. H. McCullough, Jr., V. P. & G. M.; J. P. Higginson, T.; F. F. Graham, Sec.; Herbert Melvin, A. T. & A. Sc.; L. W. Hesselman, C.; W. E. Howes, T. M.; C. R. Robinson, G. M. S.; F. H. Burnett, G. P. A.; at Lackawanna, N. Y. W. L. Wolfe, S.; at Lebanon, Pa.

Brands: "Donaghmore," "Lackawanna."

Product: Bessemer and foundry pig iron for sale, annual cap., 245,000 tons.

Properties:

2 blast furnaces, by-product coke plant, and benzol plant, at Lebanon.

Lease of 3 blast furnaces owned by Cornwall Iron Co., at Cornwall. One-sixth interest with additional voting interest in the Cornwall Ore Banks at Cornwall.

Limestone quarries at Cornwall (annual cap., 8,000 tons) and at Lebanon (annual cap., 12,000 tons).

Plants:

Colebrook Furnaces (owned), Lebanon, Pa.: 2 stacks. No. 1, 81' x 17', blt. 1881, remod. 1887, rebt. 1895, rel. 1903, remod. 1914; No. 2, 85' x 17', blt. 1882, rel. 1903; 8 2-pass center comb. Lackawanna stoves; 5 steam blowing eng. (55,000 cfm.); 8 water-tube and 18 cylindrical boilers (3,880 H. P.) Coke and coke mixed with anthracite; Cornwall ore. Product: principally foundry pig iron; annual cap., 130,000 tons.

By-product coke ovens, f. o. Mar., 1903, (232 Otto-Hoffmann); benzol plant built 1915. Annual cap., 360,000 net tons of coke, 600,000 gallons light oil.

Bird Coleman Furnaces, (leased), Cornwall, Pa.; 2 stacks. No. 3 (old No. 1), 75' x 17', blt. 1872-73; No. 4 (old No. 2), 76' x 16' 10", blt. 1879; both rebt. 1885; and rel. 1903; 8 2-pass side comb.

Whitwell stoves; 5 steam blowing eng. (60,000 cfm.); 11 water-tube and 12 cylindrical boilers (3,950 H. P.); Heyl & Patterson casting mach. Coke and coke mixed with anthracite; Cornwall ore. (Owned by Cornwall Iron Co.). Product: principally foundry pig iron; annual cap., 80,000 tons.

North Cornwall Furnace (leased), Cornwall, Pa.: 1 stack. No. 5, 77' x 17', blt. 1872, rebt. 1890, rel. 1903; 3 Whitwell stoves; 3 steam blowing eng. (25,000 cfm.); 4 water-tube boilers (1,000 H. P.). Coke and coke mixed with anthracite; Cornwall ore. (Owned by Cornwall Iron Co.). Product: principally Bessemer pig iron; annual cap., 35,000 tons.

Lackawanna Coal and Coke Co., Wehrum, Pa., inc., Jan. 1, 1901. Capital stock (all owned by Lackawanna Steel Co.), \$500,000. E. A. S. Clarke, P.; Moses Taylor, V. P.; Arthur J. Singer, A. P.; at 2 Rector St., New York. C. H. McCullough, V. P. & G. M.; J. P. Higginson, T.; F. F. Graham, Sc.; Herbert Melvin, A. T. & A. Sc.; L. W. Hesselman, C.; C. R. Robinson, G. M. S.; W. E. Howes, T. M.; F. H. Burnett, G. P. A.; at Lackawanna, N. Y. W. A. Luce, A. G. M.; at Pittsburgh. F. B. Dunbar, S.; at Wehrum.

Owns 11,611 acres of coal rights and 4,889 acres of coal lands in fee in Cambria and Indiana Counties, Pa. Annual cap., 756,000 tons.

Ellsworth Collieries Co., Ellsworth, Pa.: inc. 1907. Capital stock (all owned by Lackawanna Steel Co.), \$1,000,000; bonds outstanding Jan. 1, 1915, \$4,544,000.

E. A. S. Clarke, P.; Moses Taylor, V. P.; Arthur J. Singer, A. P.; at 2 Rector St., New York. C. H. McCullough, V. P. & G. M.; J. P. Higginson, T.; F. F. Graham, Sc.; Herbert Melvin, A. T. & A. Sc.; L. W. Hesselman, C.; C. R. Robinson, G. M. S.; W. E. Howes, T. M.; F. H. Burnett, G. P. A.; at Lackawanna, N. Y. W. A. Luce, A. G. M.; at Pittsburgh. W. E. Lahm, S.; at Ellsworth. Owns 12,464 acres of coal rights, 2,140 acres of coal lands in fee, and 490 bee-hive 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. Capital stock (all owned by Lackawanna Steel Co.), \$5,000.

George W. Smith, P.; C. H. McCullough, Jr., V. P. & G. M.; J. P. Higginson, T.; F. F. Graham, Sc.; Joseph E. Donnelly, A. T.; L. W. Hesselman, A. Sc.

The company operates 3 barges.

South Buffalo Railway Co., Lackawanna, N. Y. Capital stock (all owned by Lackawanna Steel Co.), \$500,000.

Elmer M. Tewksbury, G. S.

Operates 66 miles of track, 29 locomotives, 2 passenger cars and 370 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. E. A. S. Clarke, P.; Moses Taylor, V. P.; A. J. Singer, A. P.; at 2 Rector St., New York. J. P. Higginson, T.; F. F. Graham, Sc.; at Lackawanna, N. Y. William H. Tonking, S.; at Franklin Furnace. Owns 3,851.50 acres of mountain lands and 4,262.30 acres of mineral rights, surface not owned, near Franklin Furnace, N. J.

LACLEDE STEEL CO., 405 Merchants Laclede Bldg., St. Louis, Mo. Org. and inc. June, 1911. Capital stock: \$400,000.

Thomas R. Akin, P. & T.; H. J. Steinbreder, V. P.; D. F. Eschenbrenner, G. S. M.; at 405 Merchants Laclede Bldg.; and J. Herndon Smith, V. P.; at 509 Olive St., St. Louis. Harry F. Kay, Sc.; at Madison, Ill.

Sales offices: Chicago, 332 S. Michigan Boulevard; St. Louis, Merchants Laclede Bldg.

Madison Works, Madison, Ill.: construction commenced Aug. 4, 1911; f. o. April, 1912; 1 cont. heat. fur.; 4 trains (16" 2-h. 1-st. rail slitting; 16" 2-h. 1-st. roughing; 12" 3-h. finishing with 5-st. 3-h., 1-st. 2-h. (bullhead); 10" finishing with 4 st., 3 3-h., 1 2-h.). Fuel, prod. gas.

Product: steel rounds, squares, flats, angles, shapes and concrete bars, annual cap., 40,000 tons.

Alton Works, Alton, Ill.: construction commenced Jan. 19, 1913; first steel made Oct. 28, 1913; first products rolled Aug. 14, 1913; B. O. H. fur. (40-ton); 2 soaking pits; 1 4-d. Swindell, 1 Morgan cont. heat. fur.; 5 trains (32" 2-h. 1-st. blooming; 18" 3-h. 2-st. tandem billet; 12" 2-h. 4-st. cont. roughing; 10" 3-h. 5-st. and 8" 3-h. 6-st. finishing). Fuel, oil in O. H. dept.; prod. gas in rolling mill dept. (Formerly owned by Alton Steel Co., acquired by Laclede Steel Co., Dec. 2, 1915.)

Product: steel ingots, billets, bars, hoops, bands, strip steel and small shapes, annual cap., 75,000 tons ingots and 60,000 tons rolled products.

La Follette Coal, Iron and Railway Co., see 1908 Directory, pp. 340, 343. La Follette Furnace at La Follette, Tenn., leased to La Follette Iron Co., Oct. 28, 1909, for a term of 10 years. Project for building steel works and rolling mill abandoned.

LA FOLLETTE COAL AND IRON CO., La Follette, Tenn.

Org. and inc. Dec. 10, 1915. Capital stock: com. \$1,000,000; bonds, \$300,000.

Neil Robinson, P. & G. M.; W. H. McGee, Sc. & T.; at La Follette. Stuart W. Webb, V. P.; at Old Colony Trust Co., Boston, Mass.

Selling agents: Cincinnati, Ohio, Matthew Addy & Co.

Brand: "La Follette."

La Follette Furnace, at La Follette: 1 stack, 72' 8" x 19', blt. 1901-02; f. o. Sept. 24, 1902; rebt. 1906; 4 modified Kennedy stoves, 90' x 18'; 3 steam blowing eng. (28,000 cfm.); 6 water-tube boilers, 2,100 H. P. Coke; local red and brown ore. Company owns mines at La Follette, Tenn., and leases Wheeler mine near Cartersville, Ga., annual cap., 50,000 tons; owns 293 coke ovens at furnaces with an annual cap. of 110,000 net tons. Machine shop for own use. (Formerly owned by La Follette Coal, Iron and Railway Co.; leased by La Follette Iron Co., Oct. 28, 1909; acquired by La Follette Coal & Iron Co., Dec., 1915.)

Product: foundry and forge pig iron, annual cap., 60,000 tons.

La Follette Iron Co., see La Follette Coal and Iron Co.

LAKE ERIE IRON CO., 915 E. 63rd St., Cleveland, Ohio.

Org. 1852, inc. 1876. Capital stock: \$500,000.

W. C. Scofield, P.; F. R. Scofield, V. P.; C. W. Scofield, Sc. & T.

Works at Cleveland: rolling mill added to a bolt and nut factory 1899-1900 and first products rolled Sept. 28, 1900; 8 single scrap fur.; 4 4-d. coal heat. fur.; 3 trains (18" 3-h. 2-st. muck, 12" 3-h. 4-st. bar, 10" 3-h. 5-st. guide). Fuel, coal and oil.

Product: bar iron, annual cap., 47,500 tons.

Lake Superior Iron and Chemical Co., see Charcoal Iron Co. of America.

Lake Superior Power Co., see Canadian Supplement, p. 12, merged in Algoma Steel Corpn. in 1912.

LALANCE AND GROSJEAN MANUFACTURING CO., 299 Broadway, New York, N. Y.

Works at Harrisburg, Pa. Product: black sheets, black plates for tinning, tinplates, for own use only.

Lash Steel Process Co. of Ohio, see 1908 Directory, p. 480. Experimental plant at Niagara Falls abandoned. Equipment removed to Welland, Ont.

LATROBE ELECTRIC STEEL CO., Latrobe, Pa.

Inc. Mar. 10, 1913. Capital stock: com. auth., \$300,000, issued, \$170,000.

M. W. Saxman, P.; Charles W. Guttzeit, 1 V. P.; E. T. Edwards, 2 V. P.; F. B. McFeely, Sc.; I. B. Shallenberger, T

Works at Latrobe, Pa.: blt., 1913; first steel made Dec. 1, 1913; 3 Heroult electric fur. (1,000-lb; 3-ton; 6-ton): 2 trains (16" 3-h. 3-st. and 12" 3-h. 5-st.): forging press.

Product: electric steel ingots, special alloy and high speed steels, annual cap., 10,000 tons ingots, 7,500 tons rolled products.

Latrobe Steel and Coupler Co., see 1908 Directory, p. 387. Works at Melrose Park, Ill., acquired by the National Malleable Castings Co., July 1, 1909.

Lawrence Iron Co., see Bird Iron Co. and Marting Iron and Steel Co.

Lawrence Iron and Steel Foundry Co., see 1910 Supplement, p. 18.
Steel casting plant at 32nd St., Pittsburgh, Pa.; blt. 1909-10, f. o. Jan. 29, 1910; property sold May 1, 1912; corporate title changed to Lawrence Steel Casting Co., June 6, 1912; taken over by the Kennedy-Stroh Corporation in Jan., 1915.

Lawrence Steel Casting Co., see Lawrence Iron and Steel Foundry Co. and Kennedy-Stroh Corporation.

LEBANON BLAST FURNACE CO., Lebanon, Pa.

E. G. Rust, P.; S. M. Rust, V. P. & G. M.; G. E. Meily, Sc. & T.
Brand: "Lebanon Valley."

Lebanon Valley Furnace, Lebanon, Pa.: 1 stack, 64' 10" x 14', blt. 1867, rebt. 1904; 2 Whitwell stoves, 60' x 16'; 2 steam blowing eng. (18,595 cfm.); 11 boilers (3 water-tube, 8 cylindrical), 800 H. P. Anthracite coal and coke; Cornwall ore. (Formerly owned by the Lebanon Valley Furnace Co.; acquired by the Edgewater Iron Co. in July, 1908; acquired by present owners, Nov., 1910).
Product: Bessemer, low-phosphorus and foundry pig iron, annual cap., 24,000 tons.

Lebanon Iron and Steel Co., see 1908 Directory, p. 283, works sold in 1913 and dismantled.

Lebanon Reduction Co., see 1908 Directory, p. 280, experimental blast furnace at Lebanon, Pa., acquired by Edgar A. Weimer in 1909.

Lebanon Steel Casting Co., see 1908 Directory, p. 283, crucible steel casting plant dismantled in 1911.

LEBANON STEEL FOUNDRY, Lebanon, Pa.

Org. and inc. Dec. 11, 1911. Capital stock: com. auth., \$20,000 issued, \$14,200.

W. H. Worrilow, P.; T. S. Quinn, Sc. & T.

Works at Lebanon: blt. 1911; first steel made Feb. 1, 1912; 1 Heroult electric fur. (1-ton) added 1915; f. o. Mar. 24, 1915.
Fuel, oil and electricity. Crucible fur. blt. 1911, dismantled 1915.

Product: electric steel castings for sale for automobiles and machine tools, also alloy steel castings., annual cap., 1,500 tons.

Lebanon Valley Furnace Co., see 1908 Directory, p. 280. Lebanon Valley Furnace at Lebanon sold in July, 1908, to the Edgewater Iron Co.; acquired in 1910 by Lebanon Blast Furnace Co.

Lebanon Valley Iron Co., see 1908 Directory, p. 283, rolling mill at Lebanon, Pa., acquired by Lebanon Valley Iron and Steel Co., Jan. 31, 1910.

LEBANON VALLEY IRON AND STEEL CO., Lebanon, Pa.

Org. and inc. Jan. 28, 1910. Capital stock: com \$1,000,000; pref. 7% cum. \$1,000,000.

W. C. Sproul, P.; at Chester, Pa. Felton Bent, V. P.; Howard Longstreth, Sc. & T.; at Philadelphia, Pa. John C. Brown, G. M.; at Lebanon, Pa.

Sales offices:

Chicago, Railway Exchange Bldg.

New York, 30 Church St.

Philadelphia, Real Estate Trust Bldg.

Washington, Colorado Bldg.

Brand: "Duncannon."

Products: bar iron, machine and carriage bolts, square and hexagon nuts and forged spikes.

Duncannon Iron Works, Duncannon, Pa.: blt. 1836; rebt. after fire Feb., 1914; 22 single puddling fur.; 4 3-d. heat. fur.; 3 trains (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); 50 cut nail machines (idle). Fuel, bit. coal. Foundry and machine shop for own use. (Formerly owned by the Duncannon Iron Co.; sold by the receiver on Mar. 17, 1910 to H. H. Light; acquired by the Duncannon Iron and Steel Co. on Oct. 10, 1910; stock of the Duncannon Iron and Steel Co. acquired by the Lebanon Valley Iron and Steel Co. on Oct. 4, 1911). Product: bar iron, annual cap., 35,000 tons.

Lebanon Valley Works, Lebanon: blt. 1902-3, f. o. Jan. 12, 1903; 9 double puddling fur.; 7 3-d. heat. fur.; 4 trains (20" 3-h. 2-st. puddle; 16" 3-h. 4-st. finishing; comb. 14" and 10" 3-h. 4-st. finishing; comb. 12" and 8", with 1-st. 3-h. roughing and 5-st. 3-h. finishing). Bolt and Nut Department: machine and carriage bolts, $\frac{1}{4}$ " x 1" to 2"; nuts, $\frac{3}{8}$ " to 1", hexagon and square; rivets, $\frac{1}{4}$ " x 1" to 1" x 1"; forged spikes, $\frac{5}{16}$ " x $2\frac{1}{2}$ " to $\frac{3}{4}$ " x 6". Fuel, bit. coal. Machine shop for own use. (Formerly operated by Lebanon Valley Iron Co.; acquired by present owners Jan. 31, 1910). Product: muck and scrap bar and merchant bar iron, bolts, nuts, rivets, and forged spikes. Annual cap., 50,000 tons bar iron, 130,000 kegs bolts, 38,000 kegs nuts, 500 kegs rivets, 14,000 kegs forged spikes.

LEESPORT FURNACE CO., 419 New Market St., Philadelphia, Pa.

Org. and inc. 1900. Capital stock: \$100,000; bonds \$12,000.

P. W. Kiefaber, P.; H. R. Kiefaber, Sc. & T.

Selling agents: Philadelphia, Pa., Bullitt Bldg., J. J. Mohr & Son.

Brand: "Leesport."

Leesport Furnace, Leesport, Pa.: 1 stack, 58' x 16', blt. 1852, f. o. 1853; last rebt., 1900; 2 Gordon, Strobel & Laureau stoves, 18' x 60'; 1 steam blowing eng.; 14 cylindrical boilers, 500 H. P.

Anthracite coal and coke; local hematite and magnetic ores. Own limestone quarries at Leesport.

Product: foundry and forge pig iron, annual cap., 18,000 tons.

Leetonia Steel Co., Leetonia, Ohio.

Was formed in March, 1913, with a capital stock of \$2,000,000 to take over the properties of The Salem Iron Co. and construct a steel plant. Bonds were issued to the amount of \$1,000,000, secured by mortgage on properties. The company acquired the properties of The Salem Iron Co. consisting of McKeefry Furnace at Leetonia and coal and coke property in the Connellsville District. It also bought the Leetonia Railway (8 miles) connecting with the Pittsburgh, Ft. Wayne & Chicago and Erie railroads, and 45 acres of land adjoining The Salem Iron Co. blast furnace on which the construction of a steel plant to contain two 70-ton basic open-hearth furnaces was begun in May, 1913. The company became involved by the failure of the First-Second National Bank of Pittsburgh, receiver was appointed July 8, 1913, and all construction work stopped. Property was sold at receiver's sale in Nov., 1914, to E. H. Van Fossan of Lisbon, Ohio, acting as agent for a number of interested capitalists. McKeefry Furnace and partly constructed steel plant was sold July 29, 1915, to McKeefry Iron Co.

Lehigh Iron and Steel Co., see 1908 Directory, p. 260; two blast furnaces at Allentown, Pa., were sold and entirely dismantled in 1908.

LESSIG (GEORGE B.) CO., Pottstown, Pa.

Org. and inc. Jan. 1, 1905. Capital stock: \$300,000.

Louis C. Lessig, P. & G. M.; J. B. Lessig, Sc. & T.

Keystone Nail Works, Pottstown: blt. 1884-85; rebt. 1894; 22 double puddling fur.; 2 regenerative gas heat. fur.; three 22" 2-h. 1-st. muck mills, 22" 3-h. 1-st. grooved plate mill, 9" 3-h. 1-st. bar mill; 105 cut nail machines. Fuel, bituminous coal.

Product: muck bar, shovel, tack and nail plate and "Keystone" iron and steel cut nails. Annual cap., 30,000 tons muck bar, 14,500 tons of tack, nail and shovel plate and 300,000 kegs of cut nails.

Licking Coal and Iron Co., see 1908 Directory, p. 336; owned a rolling mill at Covington, Ky. Company was reorganized July 1, 1908, under the name of Licking Rolling Mill Co. Went into the hands of a receiver Oct. 12, 1911. Property acquired by Hilb and Bauer at receiver's sale Jan. 25, 1912; acquired by Ohio Falls Iron Co., July, 1912, partly dismantled.

Licking Rolling Mill Co., see Licking Coal and Iron Co.

Liggett Spring and Axle Co., Monongahela City, Pa., see 1908 Directory, p. 296. Works at Axleton, opposite Monongahela: make forged axles and springs, annual cap., 7,500 tons. Rolling mill abandoned.

LIMA STEEL CASTING CO. (The), Lima, Ohio.

Org. and inc. July 8, 1912. Capital stock: com. auth. \$100,000, issued \$60,000. (Formerly The Crucible Steel Casting Co.; corporate title changed Nov. 15, 1915).

B. F. Thomas, P.; W. C. Bradley, V. P.; M. L. Johnson, G. M., Sc. & T.

Works at Lima: blt. 1912; f. o. Aug., 1912; 4 8-pot crucible fur. Fuel, oil. Adding 1 Whiting converter (2,000-lb.) to be completed about Feb. 1, 1916, annual cap., 1,500 tons.

Product: crucible steel castings for sale for automobiles, etc., annual cap., 800 tons.

LINK-BELT CO., 39th St. and Stewart Ave., Chicago, Ill.

Org. and inc. Nov. 15, 1880. Capital stock: com. auth. \$3,300,000, issued \$3,204,000; pref. auth. \$750,000, issued \$750,000.

James M. Dodge, Ch.; Staunton B. Peck, V. P.; R. W. Yerkes, A. Sc.; at Philadelphia. Charles Piez, P. & T.; Prentiss L. Coonley, V. P.; P. G. Reid, Sc. & A. T.; at Chicago. A. Kauffmann, V. P.; at Indianapolis.

Plants at Chicago, Philadelphia (Nicetown) and Indianapolis, the latter has an annual cap. of 7,000 tons malleable castings.

Works at Chicago: original works blt. 1883; 1 2,500-lb. Zenze steel converter, served with 2 cupolas added 1907; first steel made, July 20, 1907. Fuel, coal, coke, and oil. Machine shop for own use.

Product: castings for own use, annual cap., 800 tons steel and 5,000 tons iron castings. Manufacture iron and steel chains for conveying, elevating and power transmission.

Linton Rolling Mill Co. (The), see 1908 Directory, p. 379. Rolling mill at Linton, Ind., taken over by the Indiana Steel and Iron Co. in August, 1911; Linton Trust Co. appointed receiver for latter company, Sept. 25, 1911. Machinery and equipment were purchased Oct. 14, 1913, by the Interstate Iron and Steel Co. and the plant dismantled in 1913-14.

LOBDELL CAR WHEEL CO., Wilmington, Delaware.

Org. and inc. April, 1867. Capital stock: \$500,000.

George G. Lobdell, Jr., P.; Charles F. Wollaston, V. P., T., & P. A.; Jos. Stuart, Sc. & S.

Works at Wilmington: blt. 1882; 1 10-ton A. O. H. steel fur. added 1909-10; 1 3½-ton fur. added 1914; first steel made Aug. 1, 1910.

Fuel, oil and prod. gas. Machine shop for jobbing and own use.

Product: steel castings, chilled iron car wheels, chilled iron rolls, and gray iron castings for sale. Annual cap., 6,000 tons steel castings, 45,000 tons iron castings.

LOCKHART IRON AND STEEL CO., Pittsburgh, Pa.

Org. and inc. Mar. 18, 1890. Capital stock: com. auth., \$1,000,000; issued, \$500,000.

J. M. Lockhart, P.; J. H. Lockhart, V. P.; at 541 Wood St., Pittsburgh, Pa. T. J. Gillespie, Sc. & T.; T. J. Gillespie, Jr., A. Sc. & A. T.; Samuel Poster, G. S.; J. M. Gillespie, G. S. M. & P. A.; at Pittsburgh (P. O. Box 1243).

Brands: "Vulcan," "Vulcan XX," and "Vulcan Special."

Vulcan Iron Works at McKees Rocks, Pa.: forge blt. 1877; rolling mill blt. 1882, enl. 1906; 38 single puddling and busheling fur., 5 forge fires, 2 upsetting machines, 8 heat. fur. (1 2-d., 1 3-d., and 6 4-d.); 5 trains (23" 3-h. 2-st. muck, 16" 3-h. 3-st. bar, 16" 2-h. 1-st. universal, 9" 3-h. 5-st. guide, and 12" mill with 16" roughing stand, 3-h. 6-st.); 4 ham. Fuel, nat. gas and coal. Machine shop for own use.

Product: rolled bar iron, bands, bridge iron, soft steel bars, and hexagon, grooved and angle iron and steel. Annual cap., 60,000 tons finished rolled iron and steel.

LOGAN IRON AND STEEL CO., Morris Bldg., Philadelphia, Pa.
Capital stock: \$240,000.

Frank G. Kennedy, Jr., P.; H. O. Enigk, Sc. & T.; at Philadelphia. David Thomas, G. M.; at Burnham, Pa.

Selling agents: Lynchburg, Va., P. O. Box 83, Withers P. Clark.

Brand: "Logan Staybolt" and "Logan Refined."

Logan Iron and Steel Works, Burnham (4 miles from Lewistown, Pa. on the M. & C. C. R. R.): blt. 1869, rebt. after fire 1894; 10 double puddling fur.; 7 4-d. coal-fired heat. fur.; 4 trains (18" 3-h. 1-st. puddle; 18" bar mill with 2-st. 3-h. and 1-st. 2-h. finishing; 12" 3-h. 5-st. guide; 10" to 8" 3-h. 6-st. Belgian comb.); 300,000-lb. machine for testing all kinds of iron, coupling links, chain, etc. Fuel, bituminous coal. Machine shop for jobbing and for own use.

Product: charcoal and refined bar iron, staybolt, crown bar, bridge iron, flats, rounds, squares, ovals, half rounds, band iron, bevel-edge iron, angles, wagon and buggy tire in round or square edge, truck sides, switch iron, skelp, drill rods to 4½" diam., and special small shapes of all sorts. Annual cap., 45,000 tons of rolled iron.

LONDON ROLLING MILL CO., Ltd., London, Ont., Canada.

Org. and inc. 1902. Capital stock: com. \$200,000; issued \$192,700.

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; 1 scrap fur.; 3 busheling fur.; 3 4-d. heat. fur.; 18" 3-h. 4-st. comb. muck and bar mill; 14" 3-h. 1-st. roughing and 10" 3-h. 4-st. finishing Belgian mill; 1 squeezer. Fuel, bit. coal.

Product: merchant bar iron and steel, annual cap., 25,000 tons.

LONDONDERRY IRON AND 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: 1 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.*

Longdale Iron Co. (The), Longdale, Va., see 1908 Directory, p. 325.

Two blast furnaces at Longdale abandoned in 1911. Company dissolved in Oct., 1914.

Longmead Iron Co., see 1908 Directory, p. 269. Works at Conshohocken, Pa., were closed July 1, 1911. Receivers appointed April 19, 1913. Machinery and equipment sold May, 1914. Land and buildings sold in August, 1914.

LORAIN STEEL CO. (The), Johnstown, Pa.

Subsidiary of the United States Steel Corporation.

Daniel Coolidge, P.; P. M. Boyd, Sc. & T.; H. M. Davies, A.; Carroll Burton, G. M.; E. B. Entwisle, C. E.

Sales offices:

Atlanta, Equitable Bldg.

Chicago, Monadnock Bldg.

Cleveland, Rockefeller Bldg.

New York, Hudson Terminal Bldg., 30 Church St.

Philadelphia, Widener Bldg.

Pittsburgh, Frick Bldg.

San Francisco, Rialto Bldg.

Johnstown Works, Johnstown: original works blt. 1887-88; f. o. May 13, 1888; 3 A. O. H. fur. (15-ton), 3 regenerative annealing fur. Fuel, coal, gas and oil. An iron foundry, a plant for the manufacture of switches, mates, curve crosses, frogs, split switches, girder crossings, drop forgings, curves, track and machine bolts, and all kinds of special work for steam and street railways.

Product and annual cap.: steel castings for own use, 15,000 tons; iron castings, 4,800 tons; switches, frogs, etc., 51,000 tons.

Loring Coes & Co., Inc., see Coes Wrench Co.

Loucks Iron and Steel Co., Scottdale, Pa. Org. and inc. 1906.

W. H. Fetter, P.; J. W. Grantham, Sc.; D. S. Loucks, T.; at Scottdale, Pa. P. H. Mynahan, G. M.; at Roanoke, Va.

Works at Roanoke, Va.: blt. 1891-92; f. o. Feb. 1892; enl. 1906-07; 15 double puddling fur.; 1 squeezer; 1 ham.; 3 straight-draft heat. fur.; 1 cont. rail heat. fur.; 3 trains (22" 3-h. 3-st. puddle, 12" Belgian with 18" 3-h. 1-st. roughing and 12" 3-h. 5-st. finishing); 10-ton B. O. H. fur. with 2 gas prod. for refining pig iron. Fuel, coal. Annual cap., 27,000 tons muck bar, 24,000 tons rerolled rails and merchant bars. *Long idle.*

Louisville Steel and Iron Co., Louisville, Ky.

George H. Holzbog, P. and sole owner; at Jeffersonville, Ind.

Works at Louisville: blt. 1900-01, rebt. 1902 after fire; 6 puddling fur.; 2 scrap fur.; squeezer; 2 heat. fur.; 2 trains (8", 12"), annual cap., 12,000 tons. Sheet mill dept.: with 2 sheet fur.; 2 annealing fur.; 2 hot black sheet mills, 1 cold mill. (Formerly operated by New Louisville Bolt and Iron Co.; acquired by present owner Nov. 1, 1911; long idle, re-organized in Feb., 1916, under the title of Louisville Steel and Iron Products Co.)

LOW MOOR IRON CO. OF VA. (The), Low Moor, Va.

Org. and inc. 1873. Capital stock: com. auth. \$1,500,000, issued \$1,050,000; pref. cum. auth. \$500,000, issued \$417,000.

Harold T. White, P.; at 14 Wall St., New York

Frank Lyman, V. P.; at 88 Wall St., New York.

John B. Guernsey, G. M.; W. N. Croxton, P. A.; at Low Moor, Va.

Selling agents: Cincinnati, Ohio, Traction Bldg., Walter-Wallingford & Co.; New York City, 55 Liberty St., Phillips Isham.

Brand: "Low Moor."

Furnaces at Low Moor: Furnace A, blt. 1880, rebt. 1910; 80' x 19'; Furnace B, 85' x 19', blt. 1887, rebt. 1902-03; 4 Whitwell and 3 Foote stoves. New River coke; local brown hematite ore. Annual cap., 130,000 tons.

Covington Furnace, Covington, Va.: 1 stack, 75' x 18', blt. 1891-03, f. o. April 20, 1895; 3 Gordon-Whitwell-Cowper stoves. New River coke; local hematite ore. Annual cap., 50,000 tons.

Product: foundry pig iron, total annual cap., 180,000 tons.

The company owns or leases seven iron-ore properties within a radius of 25 miles of the furnaces and three limestone quarries. It owns and operates two coal mines in the New River field in W. Va. (annual cap., 300,000 tons) and owns more than 7,000 acres of W. Va. coal lands.

The company operates 3 bee-hive coke oven plants; 150 coke ovens at Low Moor, Va.; 50 ovens at Covington, Va., and 150 ovens at Kay Moor, W. Va.

Lucknow Iron and Steel Co., see 1908 Directory, pp. 114-115. Company was adjudged bankrupt and receivers appointed Feb. 5, 1912.

The Elmira Steel Works formerly leased by this company were dismantled in 1909-11. The other plants, which were also leased, reverted to the owners. The Glendale Mill is now operated by the owners, the Pine Iron Works Co. and called the Pine Iron Works. For the Lucknow Forge see under Reily, John W.

Ludlum Steel and Spring Co., see 1908 Directory, pp. 246, 253. Plant at Pompton, N. J., dismantled. New plant at Watervliet, N. Y. Company now called Ludlum Steel Co.

LUDLUM STEEL CO., Watervliet, N. Y.

Org. 1854, inc. 1898. Formerly called Ludlum Steel and Spring Co., corporate title changed, July 1, 1915.

Edwin Corning, P.; Parker Corning, V. P. & Sc.; E. Palmer Gavit, T.; at Watervliet, N. Y. Cary F. Simmons, V. P.; at 2 Rector St., New York City.

Sales offices: New York City, 2 Rector St.; Philadelphia, Pa., Real Estate Trust Bldg.

Works at Watervliet, N. Y.: new plant blt. 1906-07; first crucible steel ingots made Sept., 1907; first products rolled Oct., 1907; 2 30-pot crucible fur.; one 2-ton special electric fur.; 2 trains (18" 3-h. 4-st. roughing and finishing, 9" 3-h. 9-st. finishing); 4 ham. (1,500 to 6,000-lb.). Machinery formerly in the company's plant at Pompton, N. J., partly used in equipping works.

Product: crucible ingots, alloy steel, etc.; annual cap., 5,000 tons.

LUKENS IRON AND STEEL CO. (The), Coatesville, Pa.

Est. 1810; inc. Feb. 6, 1890. Capital stock: \$500,000.

A. F. Huston, P.; Charles L. Huston, 1 V. P.; H. B. Spackman, 2 V. P. & P. A.; Jos. Humpton, Sc. & T.; Charles F. Humpton, A. Sc. & A. T.; George H. Strong, A.; Wm. H. Hamilton, G. S.; F. H. Gordon, G. S. M.

Sales offices:

Baltimore, Continental Trust Bldg.

Boston, Board of Trade Bldg.

Chicago, 1300 N. Branch St., A. M. Castle & Co. (agents).

Cleveland, 1320 Rockefeller Bldg., J. F. Corlett & Co. (agents).

Los Angeles, A. M. Castle & Co. (agents).

New Orleans, 620 So. Peters St.

New York, Whitehall Bldg., Battery Place.

Philadelphia, Commercial Trust Bldg.

San Francisco, A. M. Castle & Co. (agents).

Product: steel ingots, slabs, billets, forging blanks, steel boiler, ship, and tank plates, universal plates, etc.

The company owns the Alleghany Ore and Iron Co., which operates 3 blast furnaces and iron ore mines in Virginia.

Lukens Iron and Steel Works, Coatesville, Pa. Established 1810.

The old puddle mill, which occupied the site of the first mill which rolled boiler plates in the United States, was dismantled in 1906. The building is now used as a grinding house.

Open-Hearth Steel Dept.: No. 1: 1 A. O. H. fur. (40-ton); 5 B. O. H. fur. (40-ton); first A. O. H. steel made 1892 and first B. O. H. steel 1896. Plant No. 2: 10 B. O. H. fur. (55-ton); first steel made April 7, 1900. Annual cap., 334,000 tons of B. O. H. and 27,000 tons of A. O. H. ingots.

Plant No. 3 (under contract, to be built early in 1916): 4 B. O. H. fur. (75-ton) with building large enough for six furnaces. Estimated annual cap., 200,000 tons.

Slabbing Department: 34" x 108" slabbing mill, blt. 1901, f. o. Dec. 23, 1901. Product: slabs, billets, forging blanks, etc.; sizes of slabs, 50" x 18" and weighing 30,000 pounds, down to 4" x 4" billets, annual cap., 300,000 tons.

Plate Mills: No. 1 blt. and f. o. 1870; No. 2 blt. 1889-90; f. o. July 2, 1890; 84" sheared plate mill with 4 reverb. heat. fur.; 112" sheared plate mill with automatic tables, 3 gas heat. fur. (28' x 7'); 1 3-hole gas pit fur.; mechanical transfer cooling beds, hydraulic inspection lifts, etc.; large guillotine shears and hot plate-straightening mach. Product and annual cap.: 90,000 net tons sheared plates.

Plate Mill No. 3, blt. 1899-1900; f. o. May, 1900; 1 3-h. 48" universal mill; 4 horizontal gas heat. fur.; 1 4-hole pit fur.; electric charging and drawing crane, mechanical transfer cooling bed, electric shears, etc.; for plates 80' long, 42" wide, and $\frac{1}{4}$ " thick; shorter plates up to 48" wide and narrower plates over 100' long; steam, electric, hydraulic, and pneumatic power. Product and annual cap.: 90,000 net tons of universal plates.

Plate Mill No. 4, blt. 1901-03; f. o. June 2, 1903; 38" x 140" 3-h. plate mill, with automatic tables; 3 cont. heat. fur., 9' wide x 50' long; 2 large 4-hole pit fur.; equipped with electric cranes, straightening rolls, cooling and laying-out bed of 11,000 square feet area, on which plates are moved away from the rolls, up-edged by hydraulic lifts for examination, and delivered to the shearing department, which is equipped with three 12' guillotine shears and several smaller shears, circle cutters, etc. Annual cap., 200,000 net tons of sheared plates.

Adding 204" 4-h. sheared plate mill, (2 rolls 50" dia., 2 rolls 34" dia.) to roll plates to 196" wide. Estimated annual cap., 200,000 net tons of sheared plates.

Flanging Department: blt. 1905; 3 rotary flanging mach. for flanging standard flat flanged and standard dished and flanged heads from $\frac{1}{8}$ " to $1\frac{1}{4}$ " thick; mach. to flange from 10" dia. to 8' dia.; mach. to flange from 3' dia. to 10' dia.; mach. to flange from 5' dia. to 18' dia. Also a large hydraulic universal flang-

ing mach. of 6' reach and 200-ton pressure for irregular work and 1 large 4-column press of 1,500-ton pressure and 1 750-ton horizontal press for special work. Also equipped with punches, drills, facing mach., etc., for preparing and finishing flue holes, manholes, saddle plates, manhole and handhole covers, etc.

Boiler Brace Department: equipped for making all sizes of weldless hydraulic pressed boiler braces (Huston patent).

Steel Pole Department: product weldless and rivetless steel poles for telegraph and other purposes.

Repair shops for all mechanical and electrical work; also steel and brass foundry for own use.

Fuel used in all departments of the works, mfd. gas and bit. coal.

Total annual cap. of the rolling mills and steel works: 361,000 tons of O. H. steel ingots, 300,000 tons of slabs and billets, and 380,000 net tons of boiler and other plates.

LUNDIN STEEL CASTING CO. (The), 41 Norwood St., Neponset, Mass.

Org. and inc. 1905. Capital stock: com. auth. \$25,000, issued \$22,550.

A. G. Lundin, P.; Wm. A. Thibodeau, T.

Works at Neponset: blt. 1909, 3 8-pot crucible fur.; first crucible steel made May 3, 1909. Fuel, oil. (2-ton A. O. H. fur. dismantled, 1913.)

Product: crucible steel castings for sale for machinery, tools and automobiles, annual cap., 300 tons.

LUNKENHEIMER CO. (The), Cincinnati, Ohio.

Org. 1862, inc. 1889. Capital stock: com. \$1,000,000; pref. 6% cum., \$1,000,000.

Edmund H. Lunken, P.; E. F. Lunken, 1 V. P.; H. F. Schaefer, 2 V. P.; David C. Jones, Sec. & T.; Henry Ritter, G. S.; E. H. Korte, P. A.

Sales offices:

Boston, 138 High St.

Chicago, 186 N. Dearborn St.

London, England, 35 Great Dover St., S. E.

New Orleans, Tulane-Newcomb Bldg.

New York, 64-68 Fulton St.

Pittsburgh, Park Bldg.

San Francisco, Rialto Bldg

Works at Cincinnati: blt. 1901 to manufacture valves and steam fittings; 6 ½-ton special steel fur. added 1905 and subsequent years; 2 2-pot crucible fur. added 1908; first special steel made Dec., 1905; first crucible steel made Dec., 1908. Fuel, crude oil. Machine shop for own use.

Product: valves and other steam fittings. Annual cap., 1,500 tons special and 20 tons crucible castings for own use.

Lynch, Austin, Canton, Ohio, (owner).

Works at Greencastle, Ind.: blt. 1902-03; 6 sheet and pair fur.; 2 annealing fur.; 6 hot black plate mills; 6 cold mills. Annual cap., 18,000 tons black plates for tinning or black sheets for galvanizing. Tinhouse with 9 sets (7 tin, 2 terne), weekly cap., 5,500 boxes. (Formerly owned and operated by Western Tin Plate and Sheet Co.; acquired by present owner Nov., 1910.) *Last active in 1907. For sale.*

MACKINTOSH, HEMPHILL & CO., 12th & Etna Sts., Pittsburgh, Pa.

Inc. Feb. 13, 1893. Capital stock: \$1,000,000.

Pennock Hart, P. & T.; J. E. Fawell, A. P.; G. W. Baum, V. P.; S. H. Yahres, Sc.; E. H. Haslam, M.; Samuel McMillen, S.; A. Dietzel, P. A.

Fort Pitt Foundry, foot of 12th St., Pittsburgh: O. H. works blt. 1882 and first steel made 1882; 3 A. O. H. fur. (2 10-ton and 1 25-ton). Fuel, nat. gas. Foundry and machine shop for jobbing. Product: steel castings for sale for rolling mill machinery, including rolls and pinions; also nickel, chrome and vanadium alloy steel castings. Annual cap., 12,000 tons steel, 7,500 tons gray iron, 300 tons brass castings.

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, Ill., 204 Great Northern Bldg., H. C. Buhoup; San Francisco, Cal., Flood Bldg., McMullin & Eyre. Works at 48th St. & A. V. Ry., Pittsburgh: blt. 1901-02; first O. H. steel made Jan. 25, 1902; 3 A. O. H. fur. (2 15-ton, 1 20-ton). Malleable iron foundry. Fuel, nat. and prod. gas.

Product: steel car couplers and miscellaneous castings for sale for car and locomotive work. Annual cap., 25,000 tons steel castings, 15,000 tons malleable castings.

McCOY-LINN IRON CO., lessee, Milesburg, Pa.

Org. Nov., 1902; inc. Dec., 1902. Capital stock: com. auth. \$25,000, issued \$15,500.

Edmund Blanchard, P.; John McCoy, Sc. & T.

Selling agent: Pittsburgh, Pa., Farmers Bank Bldg., Thomas R. Heyward, Jr.

Brand: "Hecla."

Hecla Furnace, Milesburg: 1 stack, 32' x 8½', blt. 1864; cold blast; water power; open top. Charcoal; Nittany Valley hematite ore. Company owns iron ore mine 3 miles from furnace. (Owned by Estate of McCoy and Linn.)

Product: charcoal forge and foundry pig iron, annual cap., 1,800 tons.

Milesburg Iron Works, Milesburg: est. 1788; forge blt. 1830; 6 fires; 1 hammer; water power.

Product: charcoal blooms, annual cap., 2,500 tons.

Rolling mill, see 1908 Directory, p. 289, dismantled. (Owned by Estate of McCoy and Linn).

McCULLOUGH IRON CO., Equitable Bldg., Wilmington, Delaware. Org. 1847; inc. 1865. Capital stock: com. auth., \$1,000,000, issued \$450,000.

Henry Whiteley, P.; Martin E. Walker, V. P. & T.; F. L. Johnson, Sc.

Minquas Iron Works, Wilmington, Del.: blt. 1873; f. o. 1875; 4 pair and sheet fur.; 5 annealing fur.; 4 hot black sheet mills (2 22", 2 26"), 3 22" cold mills. Fuel, coal and prod. gas. Galvanizing dept. Machine shop for own use.

Product: black and galvanized steel sheets, annual cap., triple turn, 10,000 tons of sheets.

McDougall (John) and Co., see Canadian Supplement, p. 8, merged in Canada Iron Corpn. in Dec., 1908. Blast furnaces abandoned.

McGugin Iron and Coal Co. (The), see 1908 Directory, p. 367. Receivers appointed in 1910. Olive and Buckhorn furnaces abandoned.

McINNES STEEL CO., Ltd., Corry, Pa.

Limited partnership, org. April 10, 1901.

J. J. McInnes, Ch.; H. B. Smith, Sc. & T.; James H. McInnes, G. S.

Works at Corry, Pa.: 1 30-pot crucible fur.; 7 heat. fur.; 6 ham. (500 to 2,200-lb.); 12" bar mill. Fuel, coal, coke and nat. gas.

Product: carbon and alloy crucible tool steel, high speed steel, gear blanks, die blocks and special forgings. Annual cap., 1,000 tons of crucible steel ingots.

McKEEFREY IRON CO., Pittsburgh, Pa.

Org. and inc. July 16, 1915. Capital stock: com. \$100,000; pref. 6% cum. \$100,000.

John McKeefrey, P.; W. D. McKeefrey, V. P. & G. M.; N. J. McKeefrey, Sc.; F. F. Brooks, T.; E. H. Williams, G. S.; at Leetonia, Ohio.

Selling agents: McKeefrey & Co., Leetonia, Ohio.

McKeefrey Furnace at Leetonia: 1 stack, blt. 1866, rebt. 1894; 76' x 18'; 4 Cowper-Kennedy stoves (two 90' x 20', two 75' x 20'); 1 slag granulating pit; 1 casting machine. Conn. coke; Lake ore. Partly constructed steel works and rolling mill. (Formerly owned by The Salem Iron Co.; later by Leetonia Steel Co., see under that head; acquired by present owners July 29, 1915).

Product: Bessemer, basic, malleable Bessemer, foundry and forge pig iron, annual capacity, 120,000 tons.

McKEESPORT TIN PLATE CO., McKeesport, Pa.

Org. and inc. May 7, 1901. Capital stock: \$1,200,000; bonds \$625,000.

E. R. Crawford, P.; E. P. Douglas, V. P.; G. V. Parkins, Sc.; William L. Curry, T.; H. M. Clark, A.; J. E. Lauck, G. M.; J. S. Irvin, G. S.

Port Vue Mills, Port Vue, Pa.: blt. 1902-03; f. o. Mar., 1903; 42 pair and sheet fur.; 42 hot black plate mills (28" x 32", 28" x 34", and 28" x 38"); plates No. 38 to 14 gauge; 42 cold mills (25" x 36" and 26" x 44" arranged tandem, 3 sets each); 2 Mesta 4-arm pickling machines; 14 annealing fur.

Tinhouse: blt. 1902-03; first tinplate made April, 1903; 80 tinning pots. Fuel, coal in rolling mills, natural gas in tinhouse.

Product: black plates for tinning, annual cap., 185,000 tons; tinplates, annual cap., 4,000,000 base boxes.

McKenna Steel Working Co., see American McKenna Process Co.

MALLEABLE IRON FITTINGS CO., Branford, Conn.

Org. and inc. 1864. Capital stock: \$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, A. T. & G. S.; at Branford.

Works at Branford: 1 2-ton Tropenas converter with 2 cupolas added 1906; f. o. Aug. 9, 1906; 1 2-ton Stoughton converter added 1911; f. o. Mar. 17, 1911. Fuel, coal and coke. Foundry and machine shop for finishing pipe fittings and for general machine jobbing; also a galvanizing plant. (20-ton A. O. H. fur., blt. 1896, dismantled 1909.)

Product: steel and malleable castings for high pressure pipe fittings, valves, ship work, general machinery, etc., for sale; also vanadium or nickel steel castings. Annual cap., 2,500 tons steel, 2,000 tons semi-steel and 12,000 tons malleable castings.

Manhattan Rolling Mill, Inc., 362 Ave. A, New York, see 1908 Directory, p. 246, dismantled in 1912.

MANITOBA ROLLING MILL CO., Ltd., 1006 Electric Railway Chambers, Winnipeg, Manitoba, Canada.

Capital stock: com. auth. \$500,000, issued \$202,600; bonds \$116,000.

L. A. McElroy, P.; Burton S. Fletcher, 1 V. P.; J. S. Curtis, T.; at Erie, Pa. P. J. Smith, 2 V. P., G. M., G. S. M. & P. A.; T. Harry Webb, Sc.; at Winnipeg, Manitoba.

Works at Selkirk, Manitoba: blt. 1914; 4 heat. fur. (2 3-d. 2 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. Machine shop for own use. Fuel, coal.

Product: merchant bar iron, annual cap., 12,000 tons.

Former plant at Winnipeg was destroyed by fire Jan. 1, 1913 and abandoned.

MANSFIELD SHEET AND TINPLATE CO. (The), Mansfield, Ohio.

Org. and inc. Nov. 30, 1914. Capital stock: auth. \$300,000; issued \$260,000; bonds \$150,000.

W. H. Davey, P., T., and G. M.; Chas. F. Ackerman, V. P.; Albert I. Davey, Sc.; Samuel Davey, G. S.; F. M. Denzler, G. M. S.; J. E. Davies, P. A.

Selling agents:

Chicago, M. A. Purvin, 959 Monadnock Bldg.

Detroit, Geo. W. House, 1822 Ford Bldg.

St. Louis, Carl W. Phillips, 801 South 6th St.

Toronto, Canada, Edwin Schofield, 24 Dalhouse St.

Works at Mansfield, Ohio: blt. 1908-09; f. o. June, 1909; 6 sheet, 6 pair, 7 annealing fur.; 6 hot mills (3 sheet, 3 tin); 4 cold mills (24" x 48"). Fuel, coal and gas. Galvanizing dept., annual cap., 8,000 tons. (Formerly owned and operated by National Rolling Mill Co.; acquired by American Steel Co., Sept. 12, 1912; acquired by present owners Oct. 30, 1914). Adding 1 hot mill, 3 cold mills, 1 double annealing fur.; will increase cap. to 35,000 tons.

Product: black, blue, annealed, galvanized, and electrical sheets, annual cap., 30,000 tons. Automobile body and fender steel, polished blue, deep drawing and all special finished sheets.

MARION STEAM SHOVEL CO. (The), 715 West Center St., Marion, Ohio.

Org. and inc. Aug. 9, 1884. Capital stock: com. auth. \$1,500,000, issued \$1,347,700.

George W. King, P. & G. M.; Frank A. Huber, 1 V. P. & T.; Charles B. King, 2 V. P. & A. G. M.; H. C. Barnhart, Sc. & P. A.; H. T. Bell, A.; B. P. Sweney, G. S.; F. H. King, G. S. M.

Sales offices:

Adelaide, Australia, Clutterbuck Bros. (agents).

Atlanta, 1411 Candler Bldg.

Chicago, 1442-43 Monadnock Bldg.

Dallas, Texas, Everett, Bradt & Wright (agents).

Houston, Texas, Everett, Bradt & Wright (agents).

Manila, P. I., Pacific Commercial Co. (agents).

Montreal, Canada, F. H. Hopkins & Co. (agents).

New York, 2083 Hudson Terminal Bldg., 50 Church St.

Petrograd, Russia, Russian Land Reclamation Co., Ltd. (agents).

Philadelphia, J. Jacob Shannon Co. (agents).

Salt Lake City, Harris Bros. (agents).

San Francisco, Cal., 741 Monadnock Bldg.

Seattle, Wash., 1513 Smith Bldg.

Stockholm, Sweden, Graham Bros. (agents).

Vancouver, B. C., Vancouver Machinery Depot, Ltd. (agents).

Works at Marion: Steel Dept., blt. 1900-01; first converter steel

made Feb., 1901; first B. O. H. steel made Jan., 1909; 1 B. O. H. fur. (20-ton) added 1908-09; 3 hydraulic forging presses (75-ton, 350-ton and 450-ton). Fuel, oil, nat. and prod. gas. Foundry and machine shop for own use. (1 1½-ton Robert Bessemer converter dismantled, 1912.)

Product: steel castings for own use in the manufacture of steam shovels, dipper, suction and elevator dredges, ditchers, ballast unloaders, log loaders, etc. Annual cap., 10,000 tons open hearth steel, 3,500 tons iron, 400 tons semi-steel castings.

Marshall Iron Co., see 1908 Directory, p. 321, formerly owned Newport Rolling Mills, Newport, Del. Plant sold July 28, 1913, and dismantled in that year.

MARTING IRON AND STEEL CO. (The), Ironton, Ohio.

Inc. Jan. 5, 1899; org. Feb. 15, 1899. Capital stock: com. auth. \$2,000,000, issued \$1,649,700; pref. 7% cum. auth. \$350,000, issued \$130,700.

H. A. Marting, P. & G. M.; E. O. Marting, V. P. & T.; W. W. Marting, Sc.; C. B. Fowler, G. S.

Selling agents: Cincinnati, Ohio, Matthew Addy & Co.

Brands: "Nellie," "Ironton," and "Lawrence."

Product: Bessemer, foundry, malleable, and basic pig iron.

The Marting Iron and Steel Co. acquired the Ironton Iron Co. (Ironton Furnace) and The Lawrence Iron Co. (Lawrence Furnace), Sept. 1, 1912.

Alice and Blanche Furnaces, Ironton, Ohio: 2 alternate stacks; Alice Furnace, 1 stack, 86' x 18', f. o. Sept. 13, 1875; rebld. 1899. Blanche Furnace, 1 stack, 86' x 19½', f. o. 1888; rebld. 1902-03 and blown in 1903; skip hoist and bin added 1913. Furnaces equipped with 1 Foote and 3 Whitwell stoves; 3 steam blowing eng. (73,000 cfm.); 4 water-tube, 6 tubular boilers, 2,396 H. P. New River and Pocahontas coke; Lake and Kentucky ore. Slag gran. pit with an annual cap. of 70,000 tons for road ballast. Product: Bessemer, foundry, and malleable pig iron, annual cap., 109,000 tons.

Ironton Furnace, Ironton, Ohio: 1 stack, 75' x 18'; blt. 1907-08, f. o. Nov. 21, 1908; 3 Foote stoves, 85' x 20'; 3 steam blowing eng. (73,000 cfm.); 2 water-tube, 12 tubular boilers, 2,980 H. P. West Virginia coke; Lake ore. Slag gran. pit, annual cap., 54,000 tons, for road ballast. (Formerly owned and operated by The Ironton Iron Company.) Product: foundry and malleable Bessemer pig iron, annual cap., 80,000 tons.

Lawrence Furnace, Culbertson, Ohio: 1 stack, 67' x 15', blt. 1889-90; f. o. Mar., 1891; last rebld. 1905-06; 3 Gordon-Whitwell-Cowper stoves; 3 steam blowing eng. (45,000 cfm.); 2 water-tube, 8 tubular boilers, 2,196 H. P. Coke; Lake and local ores. 1 slag gran. pit with an annual cap. of 36,000 tons for road ballast.

(Formerly called Bird Furnace and operated by the Bird Iron Co.; later by The Lawrence Iron Co.) Product: basic pig iron, annual cap., 72,000 tons.

Total annual capacity: 261,000 gross tons.

Maryland Rail Co. was reorganized as the United States Rail Co., Oct. 14, 1909.

MARYLAND STEEL CO., Sparrow's Point, Md., and 1800 Morris Bldg., Philadelphia, Pa.

Org. and inc. June 27, 1891. Capital stock: \$1,000,000; bonds, \$2,000,000. Entire capital stock is owned by the Pennsylvania Steel Co. of N. J.

F. W. Wood, P.; at Sparrow's Point, Md. E. C. Felton, V. P.; R. W. Gillespie, G. M. S.; Frank Tenney, Sc.; E. T. Stuart, T.; F. S. Reitzel, C.; W. B. Enck, P. A.; at Philadelphia.

Sales agents:

Baltimore, Continental Trust Bldg.

Boston, 70 Kilby St., Mason Bldg.

Chicago, McCormick Bldg.

London, E. C., England, 110 Cannon St., Watson & Co.

New York, Empire Bldg.

Philadelphia, Morris Bldg.

San Francisco, 1505 Chronicle Bldg.

Steelton, Pennsylvania Steel Co. Bldg.

St. Louis, Commonwealth Trust Bldg.

Brand: "Maryland."

Product: Bessemer pig iron, ferro-manganese and spiegeleisen, billets, standard sections of Bessemer and open hearth rails, steam and sailing vessels and barges.

Works at Sparrow's Point, Md.:

Blast Furnaces: 4 stacks. No. 1 (formerly A), blt. 1887-89, rebld. 1911, 85' x 21' 6"; No. 2 (formerly B), blt. 1887-90, rebld. 1913, 85' x 20'; No. 3 (formerly C), blt. 1887-91, rebld. 1913-14, 85' x 21' 6"; No. 4 (formerly D) blt. 1887-91, rebld. 1914, 85' x 22'; each stack has 4 Whitwell stoves; 9 blowing eng., 4 steam and 5 gas (170,400 cfm.); 40 water-tube boilers, 10,000 H. P.; 1 double-strand Heyl and Patterson casting machine; 1 slag gran. pit, slag for cement; sintering plant with 4 Greenawalt pans 12' x 8½' for sintering flue dust and fine ore, annual cap., 95,000 tons. Molten metal to mixers. By-product coke; Cuban ore. Product: Bessemer pig iron and ferro-manganese, annual cap., 657,000 tons.

Steel works and rolling mills: Bessemer Dept.; blt. 1889-92; 3 Bessemer converters (18-ton), 2 mixers (100-ton, 1,000-ton); 4 iron, 3 spiegel cupolas; O. H. Dept.: completed 1910, f. o. Mar. 2, 1910, 5 tilting B. O. H. fur. (50-ton); 1 mixer (100-ton); 12 soaking pits (96 ingots); 36" 2-h. 1-st. blooming mill, 27" 3-h.

3-st. combined billet and rail train; 51' cont. rail reheating fur.; first blow made Aug. 1, 1891; first steel rails rolled Aug. 3, 1891. Fuel, coal and petroleum. Molten metal to converters for production of Bessemer steel; converters also used for desilicizing and decarburizing molten metal for the O. H. furnaces. Product: billets and standard sections of Bessemer and O. H. rails. Annual cap., 600,000 tons of ingots, 440,000 tons Bessemer, 160,000 tons open hearth, or 702,000 tons open hearth by duplexing; 500,000 tons billets and rails.

Marine Dept.: Product: all kinds of steam and sailing vessels and barges; plant is equipped for the construction of vessels of the largest size, both hulls and machinery, and with launching ways, machine shops, foundry, etc., sufficient to provide for, equip, and finish at one time seven large ocean freight steamers. It also builds dry docks capable of docking the largest vessels afloat.

The company operates a foundry at Sparrow's Point which produces gray iron castings for its own use.

The company also operates at Sparrow's Point, Maryland, 120 Koppers by-product coke ovens, blt. 1913-14, annual capacity, 485,000 net tons of coke, all consumed by the company.

Old coke plant, 200 Otto-Hoffmann ovens, abandoned 1913.

Massachusetts Steel Casting Co., see 1908 Directory, p. 233, works at Everett, Mass., acquired by the General Electric Co., Nov., 1910.

MASSILLON ROLLING MILL CO. (The), Massillon, Ohio.

Org. and inc. Feb. 20, 1909. Capital stock: \$3,500,000.

R. E. Bebb, P.; J. M. Jones, V. P. & G. M.; I. M. Taggart, T.; J. B. Immler, Sc.

Works at Massillon, Ohio: blt. 1908-09, f. o. Mar. 23, 1909; 11 pair and 11 sheet fur.; 3 black sheet mills (26" x 38", 26" x 44"); 8 black plate mills (26" x 34"); 11 cold mills, (24" x 52"); 12 single annealing fur.; 2 galvanizing pots. Roofing plant (idle). Fuel, coal and natural gas for annealing and sheet furnaces.

Product: black, blue and galvanized steel sheets, black plates for tinning, also special finished sheets for ceiling, enameling, and automobile work, annual cap., 50,000 tons.

MAYNARD STEEL CASTING CO., 716 Reed St., Milwaukee, Wis.

Org. and inc. May 15, 1912. Capital stock: \$6,000.

J. K. Fons, P.; F. E. Shields, Sc., T., & P. A.; L. Bergner, G. M.

Works at Milwaukee: blt. 1907; first steel made Mar. 28, 1907; 5 4-pot crucible fur. Fuel, oil. (Formerly owned and operated by Maynard Steel Foundry Co.; acquired by present owners, May 15, 1912.)

Product: small crucible steel castings for machinery and automobiles for sale, also alloy steel castings, annual cap., 1,800 tons.

Maynard Steel Foundry Co., see 1908 Directory, p. 397. Works at 710 Reed St., Milwaukee, acquired by Maynard Steel Casting Co., May 15, 1912.

MEMPHIS MINING AND MANUFACTURING CO., Winborn, Miss. Capital stock: com. auth. \$1,000,000, issued \$912,750; bonds \$125,000.

William Warmack, P.; H. S. Warmack, Sc.; at Lamkin, Miss. J. B. Baird, V. P., at Inverness, Miss.

Selling agents: Birmingham, Ala., Shook & Fletcher; Cincinnati, Ohio, Eaton, Rhodes & Co.

Brand: "Ole Miss."

Ole Miss Furnace, Winborn, Miss.: 1 stack, 32' x 5', construction commenced June, 1913; f. o. Oct. 5, 1913; steam blowing eng.; 2 water-tube boilers, 60 H. P. Charcoal; carbonate ore from own mines in Benton county.

Product: cold blast low-phosphorus charcoal pig iron, annual cap., 3,500 tons.

Menough Foundry Co., Inc. (The), see 1908 Directory, p. 376. Foundry damaged by fire and projected converter casting plant abandoned.

MERCHANT AND EVANS CO., 2019-35 Washington Ave., Philadelphia, Pa.

Org. and inc. Jan., 1894. Capital stock: com. auth. \$600,000, issued \$500,000; pref. 6% cum. auth. \$400,000, issued \$260,000. Powell Evans, P.; J. A. McKee, V. P. & T.; Thomas Evans, Sc.; C. E. Hanna, A. T.; W. E. Waters, G. S. M.; at Philadelphia. Wm. G. Brangham, S.; at Warwood, W. Va.

Sales offices: Baltimore, 232 St. Paul St.; Chicago, 347 Sheldon St.; Cleveland, 315 Champlain Ave.; Kansas City, Mo., 2008 Baltimore Ave.; New York, 242 Water St.

Warwood Plant, Warwood, W. Va. (post office address Wheeling, W. Va.; telegraph address Warwood, W. Va.): blt. 1912, utilizing machinery formerly in company's works at Philadelphia, Pa.; 7 sets, 4 for charcoal tinplates, 3 for terne plates; first tinplates and terne plates made Nov. 14, 1912. Fuel, bit. coal.

Philadelphia Plant, Washington Ave., Philadelphia, tinplate and terne plate sets dismantled Nov. 9, 1912.

Product: tinplates and terne plates, annual cap., 35,000 base boxes tinplates, 40,000 base boxes terne plates.

Merle (A.) Co. merged in Rudgear-Merle Co., July 1, 1910.

MESTA MACHINE CO., 1245 Oliver Bldg., (P. O. Box 1124), Pittsburgh, Pa.

Inc. Nov. 21 1898. Capital stock: com. auth. \$2,000,000, issued \$1 444 700; pref. 8% cum. \$150,000; bonds \$970,000.

George Mesta P.; F. E. Mesta, V. P. & G. S.; H. F. Wahr, Sc.; J. O. Horning, T.; J. B. Connally, A. & P. A.

Selling agents: Birmingham, Ala., Woodward Bldg., Shook & Fletcher Supply Co.

Works at Mesta Station, P. R. R., West Homestead, Pa.: blt. 1899; first steel made Nov. 21, 1899; 2 A. O. H. fur. (25-ton, 35-ton); 4 annealing fur.; 2 steam ham. (600, 800-lb.); 2 hydraulic forging presses (200-ton, 800-ton). Foundry with 6 air fur. and 1 72" and 3 84" cupolas. Fuel, nat. gas and coal. Machine shop for own use to complete machinery for sale.

Adding 40-ton A. O. H. fur., will increase cap. to 20,000 tons.

Product: steel rolls and general machinery castings and machine-moulded gears for sale; gray iron castings for sale, up to 200,000 lbs. Alloy steel ingots for own use. Annual cap., 12,000 tons steel, 20,000 tons iron castings.

Principal articles of manufacture: heavy gas and steam engines of all types, heavy rolling mill machinery, hydraulic presses, condensers, etc.

Metal Manufacturing Co., see 1912 Supplement p. 35; works at Elkton, Va. sold, and used for washing and grinding manganese ore only.

METRO STEEL CO., Wabash Bldg., Pittsburgh, Pa.

Works at Pittsburgh: blt. 1914: 10-pot crucible fur., f. o. Oct., 1914; 2 ham. (600-lb., 1,500-lb.) Fuel, powdered coal. May add 10-ton. B. O. H. fur. and 16" and 10" hot mills.

Product: ingots, hammered forging billets, bars, etc. Annual cap., 7,500 tons ingots and 7,500 tons forging billets, bars, etc.

Meurer Brothers Co., see 1908 Directory, p. 470. Tinplate plant at Long Island City, N. Y., dismantled in 1909. Company built a new plant at Washington, Pa., in 1909, which was dismantled in 1914.

Meyersdale Sheet Steel Works, see 1908 Directory, p. 316, long idle and abandoned but not dismantled.

MIAMI IRON AND STEEL CO. (The), 201 Rentschler Bldg., Hamilton, Ohio.

Org. Dec. 11, 1911; inc. Dec. 27, 1911. Capital stock: com. \$400,000; pref. auth. \$225,000, issued \$174,946.75.

E. M. Peters, P., G. M., G. S. M., & P. A.; E. C. Siemer, Sc., T., & A.; at Hamilton, Ohio. Edwin N. Ohl, V. P.; at Pittsburgh, Pa.

Miami Furnace at Hamilton: 1 stack, 80' x 18', blt. 1907-08, f. o. Aug. 22, 1908; 3 Kennedy central combustion stoves, 94' x 20'; 2 steam blowing eng. (40,000 cfm.); 5 water-tube boilers, 2,500 H. P. By-product coke; Lake ore. 1 Uehling double-strand casting machine; slag gran. pit, annual cap., 135,000 tons. (Formerly owned and operated by The Hamilton Iron and Steel Co.; acquired by present owners Dec. 14, 1911.) *Last active in 1910.*

Product: foundry, malleable and basic pig iron, annual cap., 100,000 tons.

Michigan Crucible Steel Castings Co., corporate title changed in 1910 to Michigan Steel Casting Co.

MICHIGAN STEEL CASTING CO. (The), 248-250 Guoin St., Detroit, Mich.

Org. and inc. Mar., 1907. Capital stock: com. auth. \$180,000, issued \$163,550; pref. 6% cum. auth. \$100,000, issued, \$58,100. R. F. Flintermann, P. & G. M.; E. B. Caulkins, Sc. & G. S. M.; Samuel Stoneham, G. S.; Peter Blackwood, P. A.; at 248 Guoin St., Detroit. H. B. Hoyt, T.; at Union Trust Bldg., Detroit.

Selling agents: Buffalo, Erie County Bank Bldg., George C. Beals; Cleveland, 723 Citizens Bank Bldg., The Charles E. Stamp Co.; Philadelphia, Drexel Bldg., J. Charles Redmond.

Works at Detroit: blt. 1907; first steel made Jan., 1910; 3 Tropenas steel converters (2 1-ton, 1 2-ton); 2 Heroult 3-phase electric fur., 1 completed and 1 building; (1 6-ton, 1 3-ton); first electric steel made Oct. 21, 1915. Fuel, oil and coke. (Formerly called Michigan Crucible Steel Castings Co.; corporate title changed to Michigan Steel Casting Co. in 1910.) (5 4-pot crucible fur. blt. 1907, dismantled 1911).

Product: steel castings for sale for automobiles, trucks and general machinery, annual cap., 6,000 tons converter, 6,000 tons electric steel castings.

Michigan Trust Co. (The), Grand Rapids, Mich.

Brand: "Trussville."

Trussville Furnace, Trussville, Ala.: 1 stack, 80' x 17½'; blt. 1887-89; f. o. April, 1889; last rebt. 1906; 5 Whitwell stoves. Alabama coke; local ore. Company owns 300 bee-hive coke ovens on the furnace property; the Graves coal mine, 318 acres, and the Labuco coal property, 2,200 acres; the Oremont iron ore property of about 1,130 acres and the Crudup iron ore property of about 1,200 acres. (Formerly owned by the Lacey-Buek Iron Co.; acquired by the Southern Steel Co., later by the Southern Iron and Steel Co.; bid in for the bondholders of the Lacey-Buek Iron Co., at foreclosure sale by The Michigan Trust Co., Grand Rapids, Mich.) *Last active in 1910, and for sale.*

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

Michigan Trust Co. (The), Receiver for Richard G. Peters, Grand Rapids, Mich.

Offer for sale or for lease the Rome Furnace, Rome, Ga. This furnace, formerly owned by Rome Furnace Co. and leased to T. J. Deane, was acquired by R. G. Peters, Jan. 1, 1909, and operated under the name of Silver Creek Furnace Co. (not inc.); placed in hands of receiver, Jan. 28, 1911.

Rome Furnace, Rome, Ga.: 1 stack, blt. 1890-91, rebt. 1909-10;

65' x 13'; 3 4-pass fire-brick stoves, 50' x 17'; 2 steam blowing eng.; 6 boilers, 1,950 H. P. 30 charcoal kilns. Last operated on coke and local hematite ore. Product: foundry and forge pig iron; annual cap., 24,000 tons. *Last active in 1911.*

Midland Steel Co., see 1908 Directory, p. 303, sold blast furnace and mill site March 1, 1911, to the Pittsburgh Crucible Steel Co.

MIDVALE STEEL AND ORDNANCE CO., 14 Wall St., New York.

Org. and inc. Oct. 5, 1915. Capital stock: com. auth., \$100,000-000; issued \$75,000,000.

W. E. Corey, P.; Wm. B. Dickson, Sc. & T.; at 14 Wall St., New York City. A. C. Dinkey, V. P.; at Widener Bldg., Philadelphia.

Midvale Steel and Ordnance Co. owns the capital stock of the Midvale Steel Co., of Nicetown, Philadelphia; the Worth Brothers Co., of Coatesville, Pa.; the Remington Arms Co., of Eddystone, Pa.; and Buena Vista Iron Company, the latter being the owner of extensive iron ore deposits in the Mayari district, Cuba. The company also acquired a controlling interest in the Cambria Steel Co. in Feb., 1916.

Remington Arms Co., 14 Wall St., New York City.

Works at Eddystone, Pa. All the capital stock acquired by the Midvale Steel and Ordnance Co. in October, 1915.

W. E. Corey, P.; A. Monell, V. P.; Wm. B. Dickson, Sc. & T.; at 14 Wall St., New York City.

Product: rifles.

MIDVALE STEEL CO. (The), Widener Bldg., Philadelphia, Pa.

Org. 1867; inc. Jan. 1, 1880.

Plants and properties acquired by the Midvale Steel and Ordnance Co. in Oct., 1915.

Alva C. Dinkey, P.; Wm. P. Barba, V. P.; Harry M. Deemer, Sc.; John C. Neale, G. M. S.; W. G. MacFarland, T.; G. Aertsen, A.; Geo. Satterthwaite, G. S.; H. L. Murphey, P. A.; P. O. Box 1606, Philadelphia.

Warehouses and offices:

Boston, 141 Milk St.

Chicago, Railway Exchange Bldg.

San Francisco, Monadnock Bldg.

Branch offices:

Atlanta, Candler Bldg.

Buenos Aires, Calle Cangallo 499.

Chicago, Railway Exchange Bldg.

Detroit, Ford Bldg.

London, 26 Victoria S. W.

New York, Fulton Bldg.

Pittsburgh, Oliver Bldg.

Rio Janeiro, Caixa Postal 1891.

Salt Lake City, New House Bldg.

San Francisco, Monadnock Bldg.

Santiago, Cuba, Anglo South American Bank.

Seattle, Colman Bldg.

Works at Nicetown, Philadelphia. Product: steel ingots and castings, rolled tires, wheels, bars, steel, (spring, machinery and tool), forged billets, bar steel, armor plate, ordnance, axles, shafts, and marine and miscellaneous forgings; annual cap., 105,100 tons of acid and 43,000 tons of basic steel ingots; 3,090 tons crucible steel ingots; 2,200 tons of acid and 6,500 tons of basic open hearth steel castings for sale and for the company's use; 61,000 tons of rolled products and 75,000 tons of forged products; also 9,000 tons of iron and 40 tons of brass and bronze castings for the company's use only.

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; Dutchess 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.

Org. Sept. 14, 1908; inc. Aug. 31, 1908. Capital stock: com. auth. \$50,000, issued \$30,000; pref. 7% cum. auth. \$20,000, issued \$12,900.

Fred W. Moore, P. & T.; Henry H. Merriam, V. P.; William W. Brierly, Sc., G. M., & P. A.

Works at Millbury: blt. 1902; first crucible steel made 1902; 4 crucible fur., 40 pots; 1 Rockwell 2-d. annealing fur. Fuel, crude oil. (Formerly operated by the Worcester Steel Foundry Co.; acquired by the Oakley Steel Foundry Co., 1908; name changed to Millbury Steel Foundry Co., July 1, 1910).

Product: crucible steel castings for sale, from 1 to 1,000 lbs., for machine tools and automobiles, annual cap., 500 tons.

Milliken Brothers, Inc., 111 Broadway, New York City.

Milliken Steel Works, Staten Island, N. Y.: 5 50-ton B. O. H. fur. and a rolling mill dismantled in 1914. Operates bridge and structural fabricating plant equipped for fabrication and erection of steel bridges, buildings, and all kinds of structural steel work, including transmission towers and poles, annual cap., 65,000 tons.

MILTON MANUFACTURING CO. (The), Milton, Pa.

Org. 1886, inc. Feb., 1893. Capital stock: com. auth. \$750,000, issued \$600,000.

George S. Shimer, P.; O. H. Rinehart, Sc.; W. B. Clinger, T.; T. M. Miles, G. S.

Works at Milton: blt. 1886-87; f. o. Feb., 1889; 5 double puddling fur., 8 heat. fur. (1 2-d. and 7 3-d.); 5 trains (20" 3-h. 2-st. puddle, two 16" 3-h. 2-st. bar, two 10" 3-h. 4-st. guide); 1 steam ham. Fuel, powdered bit. coal.

Product: muck bar and bar iron; annual cap., 20,000 tons muck bar, 40,000 tons of bar iron, the latter largely for own use in the manufacture of hot pressed and cold punched nuts, washers, etc.

MILWAUKEE STEEL FOUNDRY CO., Milwaukee, Wis.

J. G. Shaw, P. & T.; F. A. Weiss, V. P.; C. W. Inglis, Sc.

Works at South Water and Virginia Sts., Milwaukee: blt. 1903-04; 2 Tropenas converters (2-ton); first steel made March 15, 1904. Fuel, coke.

Product: steel castings for sale, annual cap., 6,500 tons.

Mineral Mining Co., Salt Lake City, Utah. Works at Salt Lake City, Utah: blt. 1913-14; f. o. Jan., 1914; 1 experimental Jones down draft furnace for direct reduction of iron ore. *Idle.*

MINNEAPOLIS CRUCIBLE STEEL CO., Minneapolis, Minn.

Org. 1909. Capital stock: \$100,000. G. L. Fort, P. & T.; A. F. Fort, Sc.

Works at Minneapolis: 4 6-pot crucible fur.; first crucible steel made Aug. 23, 1909.

Product: crucible steel castings for machinery purposes for sale, annual cap., 500 tons.

MINNESOTA STEEL CO., Duluth, Minn.

Org. and inc. 1907. Subsidiary of the United States Steel Corp. E. H. Gary, P.; George L. Reis, V. P.; W. J. Filbert, Sc.; Richard Trimble, T.; Geo. D. Swift, A. Sc. & A. T.; D. F. Burch, A.; S. B. Sheldon, G. S.; R. E. Mace, P. A.

Works at Duluth, Minn.

Blast Furnaces: 2 stacks (thin-lined); blt. 1910-15, 90' x 22' 6"; 10 3-pass McClure type stoves, 105' x 22' 6"; No. 1 blown in Nov. 29, 1915; No. 2 not blown in to Dec. 31, 1915; 5 gas blowing engines. Molten metal to mixer and O. H. furnaces. Four slag granulating pits. By-product coke; Lake ore. Product: basic pig iron, annual cap., 325,000 tons.

By product coke plant: 90 Koppers ovens, first coke made, Oct. 25, 1915; annual cap., 350,000 net tons.

Steel Plant: blt. 1911-15; mixer (600-ton); 10 B. O. H. fur. (75-ton); first steel made Dec. 11, 1915. Annual cap., 500,000 tons ingots.

Rolling Mills: blt. 1911-15; 4 4-hole soaking pits (64 ingots); 3 cont. heating fur.; 40" 2-h. 1-st. reversing blooming; 28" combination rail, bar and structural with 6-st. 2-h. and 2-st. 3-h.;

18" rail, bar and structural with 1-st. 2-h. and 2-st. 3-h.; 16" continuous combination merchant mill with 16" 2-h. 9-st. roughing and 12" 2-h. 3-st., 10" 2-h. 2-st., 8" 2-h. 2-st. finishing; first blooms rolled, Dec. 13, 1915. Machine shop for own use. Product: rails, bars and structural shapes, annual cap., 360,000 tons.

MISSOURI MALLEABLE IRON CO., East St. Louis, Ill.

F. E. Nulsen, P. & G. M.; A. J. Nulsen, V. P.; H. L. Baur, Sc.; D. G. Rhoades, A. G. M.; H. Berkemeyer, T.; J. P. Pero, S.

Works at East St. Louis, Ill.: blt. 1892; O. H. steel fur. added 1900; 2 cupolas; 5 gas prod.; 17 annealing fur.; 6 air fur.; 1 25-ton B. O. H. fur. Fuel, coal. Do not make steel.

Product: malleable iron castings; annual cap., 25,000 tons.

MITCHELL-DIGGINS IRON CO., Cadillac, Mich.

Inc. Feb. 21, 1905. Capital stock: com. \$200,000.

C. T. Mitchell, P.; W. L. Saunders, V. P.; F. E. Neahr, Sc.; J. C. Ford, T.

Brand: "Cadillac."

Cadillac Furnace, Cadillac: 1 stack, 60' x 12'; blt. 1905-06, f. o. Mar. 6, 1906; 3 fire-brick stoves; 1 steam blowing eng. (35,000 cfm.); 3 horizontal water-tube boilers, 250 H. P. Charcoal; Lake ore.

Product: malleable, car wheel, and strong foundry charcoal pig iron, annual cap., 40,000 tons.

MOFFAT-IRVING STEEL WORKS, Ltd., 400 Front St. East, Toronto, Canada.

Org. Dec. 1, 1913; inc. Aug. 8, 1913. Capital stock: com. \$55,000; pref. 6% cum. \$45,000; bonds \$19,400.

James B. O'Brian, K. C., P.; at Traders Bank Bldg., Toronto, Ontario. James W. Moffat, V. P. & G. M.; L. St. Clair Little, Sc. & T.; at 400 Front St. East, Toronto, Ontario.

Works at 400 Front St. East, Toronto: one 3,000-lb. Moffat electric fur. blt. 1912; f. o. experimentally June, 1912; commercially July, 1913; also 500-lb. electric fur. for melting alloys. Fuel, coke and charcoal.

Product: electric steel castings for sale; manganese steel castings, annual cap., 960 tons.

MONARCH FOUNDRY CO., Sacramento and Oak Sts., Stockton, Cal.

Org. Sept., 1903; inc. June 11, 1907. Capital stock: com. auth. \$25,000, issued \$20,400.

E. H. Noack, P. & G. M.; A. L. Healey, V. P.; R. L. Quisenberry, Sc. & T.

Works at Sacramento and Oak Sts., Stockton: will install one Heroult electric fur. (2,500-lb.) to be completed about Mar. 1, 1916.

Product: carbon and manganese electric steel castings for sale and own use, annual cap., 1,800 tons. Make iron, brass, bronze and semi-steel castings; centrifugal pumps and gas engines.

MONARCH STEEL CASTINGS CO., Union Trust Bldg., Detroit, Mich.

Inc., Dec. 20, 1905. Capital stock: com. auth. \$200,000, issued, \$185,000.

Philip H. McMillan, P.; Joseph S. Stringham, V. P. & G. M.; James R. Coulter, Sc. & T.; at Union Trust Bldg., Detroit. E. F. Wilkinson, G. S.; Charles Gifford, G. S. M.; Neil MacDonald, A. M.; at Solvay Ave. & Wabash Railroad, Detroit.

Selling agents: Chicago, H. F. Wardwell; St. Louis, W. Harding Davis.

Works at Solvay Ave. & Wabash Railroad, Detroit: blt. 1906, f. o. July 20, 1906; 1 B. O. H. fur. (20-ton); 1-ton Tropenas steel converter added in 1915; first converter castings made Nov. 1, 1915. Fuel, oil.

Product: Monarch, Lion and Detroit couplers and coupler attachments for railroad cars, annual cap., 7,000 tons open hearth, 2,000 tons Tropenas castings.

Monongahela Iron and Steel Co., see Carter Iron Co.

MONROE STEEL CASTINGS CO., Monroe, Mich.

Org. and inc. Jan. 15, 1912. Capital stock: com. auth. \$40,000, issued \$35,000; pref. auth. \$10,000, none issued.

August Loeffler, P.; S. M. Salloitte, V. P.; at Wyandotte, Mich. Silas A. King, Sc., T., & G. M.; at Monroe, Mich. J. P. Wakefield, G. S. M.; at Toledo, Ohio.

Works at Monroe: blt. 1910-11, f. o. Feb. 21, 1911; 7 6-pot crucible fur. Fuel, oil. Adding electric fur. to be completed about April 1, 1916, annual cap., 3,000 tons.

Product: steel castings for sale for automobiles, motor trucks, connecting rods, car bolsters, brakeheads, general machinery purposes, lead and cyanide pots, carbonizing boxes, also alloy steel castings. Annual cap., 2,000 tons.

Montreal Rolling Mills Co. (The), see Canadian Supplement, p. 9, merged in The Steel Company of Canada, Ltd., July 1, 1910.

Montreal Steel Works, Ltd., see Canadian Supplement, p. 9, merged in Canadian Steel Foundries, Ltd., Jan. 1, 1911.

MOORHEAD BROTHER & CO., INC. Sharpsburg, Pa.

Inc. Jan. 15, 1894. Capital stock: \$400,000.

John Moorhead, Jr., P.; E. A. Hughes, Sc.; Turner D. Moorhead, T.

Brand: "Vesuvius."

Vesuvius Iron and Nail Works, Sharpsburg, Pa.: blt. 1846; 40 single puddling fur.; 9 regen. heat. fur. (4 3-d., 5 4-d.); 1 4-ton ham.; 3 trains (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. Fuel, nat. gas and coal. Machine shop for own use.

Product: bar, boiler, sheet, tank, and skelp iron and steel, annual cap., 100,000 tons rolled products.

Morgan Spring Co., Worcester, Mass. Works at Struthers, Ohio, see 1908 Directory, p. 357, acquired by the Youngstown Sheet and Tube Co., March 16, 1908.

MORRIS IRON AND STEEL CO. (The), Frederick, Maryland.

John Mitchell, Jr., P. & T.; Walter P. Leatherman, V. P.; C. C. Biser, Sc.; J. W. Bache, G. M.

Works at Frederick, Md.: blt. 1911; 1 Tropenas steel converter (2-ton) with 1 cupola commenced Feb. 6, 1914; f. o. April 20, 1914. Fuel, coke and oil. Machine shop for jobbing and own use. (1 Wills comb. fur. (5-ton) blt. 1912-13, dismantled Dec., 1913.)

Product: steel castings for sale for automobiles, flanges, gears, etc., also gray iron castings. Annual cap., 2,500 tons steel, 10,000 tons iron castings.

MUIRKIRK IRON CORPORATION (The), Muirkirk, Md.

Org. and inc. Dec. 9, 1914. Capital stock: pref. auth. \$10,000, issued \$5,000.

Harry R. Jones, P. & G. M.; S. D. Hall, Sc.; E. W. Pearre, T.; J. S. Jones, A.

Selling agents: Hickman, Williams & Co.; Rogers, Brown & Co.; and George T. Johnson & Co.

Brand: "Muirkirk."

Muirkirk Furnace, Muirkirk: 1 stack, 36' x 8' 8", blt. 1847; rebt. 1888; warm blast; open top; 1 steam blowing eng. Charcoal, local carbonate ore; 6 charcoal kilns (idle). (Formerly owned by the Estate of Charles E. Coffin; leased by Ellery F. Coffin & Co., April 1, 1909; later by E. F. Coffin alone; sold to present company Dec., 1914.)

Product: charcoal pig iron for car wheels, gun carriages, flange iron, rolls, shot and shell, etc., annual cap., 6,000 tons.

MUSCONETCONG IRON WORKS, Elizabeth, N. J.

Brand: "Musconetcong."

Musconetcong Furnace, Stanhope, N. J.: 1 stack, 80' x 17', blt. 1871, rebt. 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 magnetic, Lake, Cuban and other ores.

Product: foundry pig iron, annual cap., 50,000 tons.

Muskegon Steel Casting Co., Muskegon, Mich., see 1912 Supplement, p. 49; acquired by the West Michigan Steel Foundry Co. Sept. 30, 1912.

Myers (H. M.) Co., Beaver Falls, Pa., see Ames Shovel and Tool Co.

NAPIER IRON WORKS, 911-15 Stahlman Bldg., Nashville, Tenn.

Org. and inc. May 30, 1890. Capital stock: com. auth., \$300,000, issued, \$262,000; bonds \$243,000.

W. R. Cole, P. & G. M.; Wm. H. Lindsey, 1 V. P.; R. M. Davis, Sc. & T.; at Nashville, Tenn. J. F. Fall, Sr., 2 V. P.; at 60 Broadway, New York. P. D. Cosper, G. S.; at Napier, Tenn.

Selling agents: Rogers, Brown & Co., and Hickman, Williams & Co. Brand: "Napier."

Furnace at Napier, Tenn.: 1 stack, 60' x 12½', blt. 1891, remod. 1897; 3 2-pass fire-brick stoves, 55' x 16'; 2 steam blowing eng. (20,000 cfm.); 13 boilers (2 Wickes water-tube, 1 tubular fire tube, 10 two-flue cylindrical), 900 H. P. Virginia coke; local brown ore. Machine shop for own use. Company owns iron ore mines at Napier, annual cap., 60,000 tons.

Product: foundry pig iron, annual cap., 36,500 tons.

NATIONAL ALLOY CO., Ltd., 25th & Dickinson Sts., Philadelphia, Pa.

Org. and inc., 1911. Capital stock: \$10,000; bonds, \$7,500.

Henry P. Miller, P.; William J. Miller, Sc.; William Spratt, T. Works at 25th & Dickinson Sts., Philadelphia: make silico-manganese and manganese copper, annual cap., 150 tons; also ground ferro-manganese, ferro-silicon, ferro-chrome and manganese dioxide. Fuel, charcoal and electricity.

National Brake and Electric Co., see 1908 Directory, p. 398. Subsidiary company formed to manage steel foundry, called National Steel Foundries, took over the property Jan. 1, 1914. See under National Steel Foundries.

NATIONAL CAR COUPLER CO., Attica, Ind.

Org. and inc. Jan., 1913. Capital stock: \$300,000.

J. W. Harrison, P. & G. M.; S. E. Doster, Sc. & P. A.; at Attica, Ind. H. L. Bailey, 1 V. P.; W. A. Ruth, G. S. M.; at McCormick Bldg., Chicago, Ill. W. E. Weinsheimer, T.; at Winnetka, Ill. Sales office: Chicago, Ill., 522 McCormick Bldg.

Works at Attica, Ind.: blt. 1906-07; first steel made May 18, 1907; two 15-ton A. O. H. fur. Fuel, oil and coal.

Product: freight and passenger car couplers, small couplers for industrial cars, centering yokes, steel platforms, platform buffers, Hinson draft rigging and emergency knuckles; steel castings from 1 lb. to 25,000 lbs. for sale. Annual cap., 15,000 tons.

NATIONAL ENAMELING & STAMPING CO., 303 Fifth Ave., New York, N. Y.

Inc. Jan. 21, 1899. Capital stock: com. auth. \$20,000,000, issued \$15,591,800; pref. 7% cum., auth. \$10,000,000, issued \$8,546,600; bonds, April 1, 1915, \$2,766,000.

F. A. W. Kieckhefer, P.; R. D. Samuels, A. Sc., A. T., & P. A.; at 303 Fifth Ave., New York. T. K. Niedringhaus, 1 V. P.; at New Bank of Commerce Bldg., St. Louis, Mo. George W. Niedringhaus, 2 V. P.; at Granite City, Ill. W. H. Matthai, Sc.; at 1901 Light St., Baltimore, Md. George V. Hagerty, T.; at 378 Broadway, New York.

Sales offices:

Baltimore, Md., Ohio Ave. & Light St.

Chicago, Ill., 346 Kinzie St.

Milwaukee, Wis., St. Paul Ave.

New Orleans, La., So. Peters and Calliope Sts.

New York, 374-78 Broadway.

Philadelphia, Pa., 24th & Walnut Sts.

St. Louis, Mo., 809 New Bank of Commerce Bldg.

Product: ingots and sheet and tinplate bars for own use; blue annealed sheets, black and galvanized sheets, black plates for tinning, coke and charcoal tinplates; enameled, japanned, tinned and galvanized stamped ware.

Granite City Branch, Granite City, Ill.: Steel works: blt. 1895, first basic steel, Aug. 31, 1895; enlarged 1899-1900; 4 B. O. H. fur. (60-ton); 14 soaking pits; 36" 2-h. 1-st. universal mill; 54" jobbing plate mill with 3 pair and 1 double sheet fur.; 4 hot black sheet mills (2 34", 1 38", 1 46") with 2 double and 2 single sheet and 5 pair fur.; 1 open annealing fur.; 20 hot black plate mills (28" x 28" to 28" x 38") with 20 pair and 20 sheet fur.; 14 cold mills (22" x 32" to 22" x 46") 4 tandems of three sets, 1 in two; 3 pickling mach.; 1 hand pickling tank, 20 box annealing fur. **Product and annual cap.:** 120,000 tons of ingots; 110,000 tons of billets, sheet and tinplate bars and universal plates; 72,000 tons of blue annealed sheets and black sheets for deep drawing and enameled; 21,600 tons of black plates for tinning. **Tinplate works:** 23 sets, 22 for coke and 1 for charcoal tinplates, annual cap., 1,200,000 base boxes coke, and 50,000 base boxes charcoal tinplates. **Plant for the production of enameled, tinned and stamped ware.**

Granite Iron Rolling Mills Branch, Second & Destrehan Sts., St. Louis, Mo.: blt. 1879; enl. 1900; 6 black sheet mills (5 36", 1 42"); 6 pair and 6 sheet fur.; 2 42" cold mills; 6 box annealing fur.; 2 hand pickling tanks, 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 Branches, Baltimore, Md. 2 plants: Matthai, Ingram & Co. Branch, Ohio Ave. & Light St.: product, enameled, japanned, pieced, and stamped ware, etc. Keen and Hagerty Branch, Race and Ostend Sts.: 4 galvanizing pots; product, galvanized, tinned, and japanned stamped ware.
- Laurel Hill Branch, Long Island, N. Y. Product, enameled ware, galvanized iron ware, etc.
- Granite City Branch, Granite City, Illinois. Product, enameled, tinned and stamped ware, etc.
- Milwaukee Branch, St. Paul Ave., Milwaukee, Wis.: 4 galvanizing pots; product, tinned, japanned, brass, copper, and galvanized ware.
- New Orleans Branch, So. Peters and Calliope Sts., New Orleans, La.: 2 galvanizing pots; product, plain, retinned, and pieced tinware and japanned and galvanized ware.

NATIONAL FOUNDRY CO., Erie, Pa.

Org. and inc. July 11, 1899. Capital stock: \$100,000; bonds \$150,000.

E. D. Wetmore, P.; J. P. Jefferson, T.; at Warren, Pa. E. W. Sheldon, V. P. & G. M.; A. H. Willis, A. T.; A. W. Reichert, Sc.; at Erie, Pa.

Works at Erie: steel foundry: 1 A. O. H. fur. (25-ton); first steel made Mar. 4, 1907. Gray iron foundry. Fuel, oil.

Product: steel castings for sale for general machinery and railroad uses. Annual cap., 15,000 tons steel, 6,000 tons iron castings.

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.; Clayton Mark, Samuel Lewis Smith, William G. Kranz, V. P.; N. S. Lewis, Sc. & T.

Sales offices:

Cleveland, 7706 Platt Ave., S. E.

Chicago, 311 Railway Exchange Bldg.

Chicago, 2610 W. 25th Place.

Indianapolis, 546 Holmes Ave.

Melrose Park, Ill.

New York, 30 Church St.

Philadelphia, 1205 Franklin Bank Bldg.

St. Louis, 1850 Railway Exchange Bldg.

St. Paul, 908 Merchants National Bank Bldg.

San Francisco, 705 Monadnock Bldg.

Sharon, Pa.

Toledo, Ohio, Front St.

Washington, 812 Munsey Bldg.

Product: O. H. and electric steel castings, automatic steel car couplers and all kinds of malleable iron castings.

The company operates 8 plants, 6 for the manufacture of malleable iron castings and 2 for steel castings and car couplers. The malleable iron castings plants are located as follows:

Cleveland Works, 7706 Platt Ave., S. E., Cleveland, Ohio.

Chicago Works (3 plants)

25th St., near Western Ave., Chicago.

26th St., near Western Ave., Chicago.

Grant Works, 52nd Ave., Chicago.

Indianapolis Works, West Michigan St. and Holmes Ave., Indianapolis, Ind.

Toledo Works, Front St., Toledo, Ohio.

The steel castings plants are located at Melrose Park, Ill., and Sharon, Pa.

Melrose Park Works, Melrose Park, Ill.: blt. 1884-85, first steel made Feb., 1885; 4 B. O. H. fur. (30-ton). Fuel, coal and oil. (Formerly owned and operated by the Latrobe Steel and Coupler Co.; acquired by the present company July 1, 1909.) Product: steel castings and automatic steel car couplers for sale, annual cap., 40,000 tons.

Sharon Works, Sharon, Pa.: orig. blt. 1890-91; 7 B. O. H. fur. (3 15-ton, 4 25-ton); 1 5-ton Heroult electric fur. blt. 1912; first electric steel made July, 1912. Fuel, coal and oil. 5-ton Heroult electric steel fur. to be added. Product: O. H. and electric steel castings and automatic steel car couplers for sale, annual cap. about 55,000 tons.

National Rolling Mill Co., Mansfield, Ohio, see 1910 Supplement p. 26. acquired by American Steel Co., Sept. 12, 1912; acquired by Mansfield Sheet and Tinplate Co., Nov., 1914.

NATIONAL ROLLING MILL CO., Vincennes, Ind.

Org. and inc. 1901. Capital stock: \$150,000; bonds \$38,000.

C. B. Kessinger, P.; Edward Watson, V. P.; J. H. Jones, Sc. & T.; S. N. Bradshaw, G. M.

Works at Vincennes: originally blt. at Hartford City, Ind., 1901; f. o. Sept. 30, 1901; removed to Vincennes 1903-04, and put in operation Feb. 15, 1904; 6 scrapping, 3 cinder-bottom, and 4 4-d. heat. fur.; 3 trains (18" 3-h. 2-st. muck, 10" 3-h. 4-st. finishing, 8" 3-h. 3-st. finishing). Fuel, bit. coal. Machine shop for own use.

Product: scrap bar and finished iron and steel bars. Annual cap., 20,000 tons scrap bars, 20,000 tons finished bars.

National Steel and Wire Co., see 1908 Directory, p. 110, went into hands of receivers in 1907. Plants of DeKalb Fence Co., National Wire Corporation, Pacific Steel & Wire Co., and Union Fence Co. were acquired by the American Steel and Wire Co. Works

at Bayonne are operated by the Safety Insulated Wire and Cable Co. as formerly. This company also acquired the National Steel Foundry Co. plant at New Haven.

NATIONAL STEEL CASTING CO., Montpelier, Ind.

Org. and inc. 1897. Capital stock, \$200,000; bonds \$12,500.

G. Max Hofmann, P.; F. E. W. Scheimann, T. & A.; at Fort Wayne, Ind. James O'Donnell, V. P.; T. C. Neal, G. M., G. S., & G. S. M.; Glenn Ayers, P. A.; at Montpelier, Ind. D. F. Bash, Sc.; at Indianapolis, Ind.

Works at Montpelier: blt. 1896; f. o. that year; 2 A. O. H. fur. (15-ton); 1 B. O. H. fur. (4-ton); 4 8-pot crucible fur. added in 1911. Fuel, nat. gas and oil. Own natural gas wells.

Product: car couplers, knucklers, and a general line of steel castings from 5 to 20,000 lbs.; also alloy steel castings; specialty, railroad, mining and electric castings for sale. Annual cap., 5,000 tons O. H. (3,500 tons acid, 1,500 tons basic) and 1,350 tons crucible steel castings.

NATIONAL STEEL FOUNDRIES, Milwaukee, Wis.

Org. and inc. Dec. 29, 1913. Capital stock: \$5,000, owned by National Brake & Electric Co.

R. P. Tell, P.; P. H. Breed, V. P.; Wm. K. Boyle, Sc. & T.; R. H. Weiland, A.; C. W. Lythe, M.

Sales office: Chicago, Ill., 811 Railway Exchange Bldg.

Works at Milwaukee: blt. 1899-1900; O. H. department added 1904; 2 A. O. H. fur. (5-ton, 15-ton); first steel made Aug. 1, 1904; crucible fur. abandoned in 1911. Plant for the manufacture of air brakes and electrical machinery. Fuel, oil. (Expect to add 1 additional 15-ton A. O. H. fur.)

Product: steel castings; specialties, crank shafts, magnet frames, pole pieces, and general machinery castings for sale. Annual cap., 10,000 tons.

National Steel Foundry Co. acquired by Safety Insulated Wire & Cable Co., Mar. 21, 1910.

NATIONAL TRANSIT PUMP & MACHINE CO., 206 Seneca St., Oil City, Pa.

Org. April 14, 1881; inc. April 30, 1881. Capital stock: com. \$12,727,575. Formerly called National Transit Co.

W. V. Miller, P.; R. Huyck, V. P.; S. R. Ball, Sc.; C. H. Lay, T.; C. F. Martin, A.; F. D. Williams, G. M.; at Seneca St., Oil City, Pa. N. A. Newton, C. E., G. S. M.; C. M. Holbrook, P. A.; at Bridge St., Oil City, Pa.

Works at Oil City, Pa.: one Tropenas steel converter (5-ton) blt. 1900, f. o. 1900; 2 crucible fur.; 4-ton reverberatory fur.; 4 tilting brass fur. (three 400-lb., one 800-lb.), and 4 cupolas; 5 ham. (700 to 2,500-lb.); 300-ton hydraulic forging press; 1½"

and 3" Acme headers. Fuel, oil, coke, gas, and coal. Machine shop for own use and jobbing.

Product: steel, semi-steel, brass, bronze, and iron castings for sale and own use. Annual cap., 3,650 tons steel, 90,000 tons iron, and 18,000 tons brass castings.

NATIONAL TUBE CO., Frick Bldg., Pittsburgh, Pa.

Org. and inc. Feb. 15, 1899.

Subsidiary of the United States Steel Corporation.

William B. Schiller, P.; Edward Worcester, 1 V. P.; Taylor Allerdice, 2 V. P.; B. C. Moise, Sc. & A.; G. E. Benson, T.; John J. Kennedy, G. S. M.; D. H. Ramsbottom, A. G. S. M.; S. M. Lynch, P. A.; Peter Boyd, G. S.; John W. McKee, A. T.; C. B. Foster, A. Sc.

Sales offices:

Atlanta, Ga., Candler Bldg., Henry P. Nelson, S. M.

Chicago, Ill., Continental and Commercial Bank Bldg., H. S. Raymond, S. M.; and sub-sales offices at St. Paul, Minn., Pioneer Bldg.; Omaha, Neb., City Nat. Bank Bldg.

Denver, Col., Majestic Bldg., Edwin H. Fowle, S. M.; and sub-sales office at Salt Lake City, Utah, Walker Bank Bldg.

New Orleans, La., Maison Blanche Bldg., Hugo Weidmann, S. M.

New York, Hudson Terminal Bldg., Clifton Wharton, Jr., S. M. Sub-sales offices, Boston, Mass., John Hancock Bldg.; Philadelphia, Pa., Pennsylvania Bldg.

Pittsburgh, Pa., Frick Bldg., A. M. Lally, S. M.

St. Louis, Mo., Third Nat. Bank Bldg., Edward Worcester, Jr., S. M.; sub-sales office, Kansas City, Mo., R. A. Long Bldg.

National Tube Co. sells all products of The National Tube Co. of Ohio and Shelby Steel Tube Co. through the sales offices listed above.

Product: Bessemer pig iron, Bessemer ingots, blooms, billets, slabs, muck bar, skelp, socket iron, charcoal iron skelp, gray and malleable iron and brass castings, wrought, black and galvanized pipe, boiler tubes, seamless tubes, flasks, and cylinders.

National Tube Co. operates the works described below.

Christy Park Works, McKeesport, Pa.: Product, large diameter seamless tubes, seamless flasks and cylinders, and other job work, annual cap., 8,200 tons.

Continental Works, Second Ave., Pittsburgh, Pa.: blt. 1862; 32 single puddling fur.; 5 heating fur.; 20" 2-h. 2-st. muck, 18" 3-h. 3-st. skelp, 10" 3-h. 4-st. skelp, and 8" 3-h. 4-st. skelp mills. Fuel, coal and prod. gas. Machine shop for own use. Product and annual cap.: 27,000 tons muck bar, 70,000 tons skelp and socket iron.

Tube Mills: product, wrought pipe from $\frac{1}{4}$ " to 8" inclusive, annual cap., 80,000 tons.

Kewanee Works, Kewanee, Ill. (formerly Western Tube Co.):

Rolling mills formerly in these works dismantled in 1908. Tube mills dismantled, 1915-16.

Foundry: product and annual cap., 28,400 tons gray iron and malleable castings, 2,600 tons brass castings.

National Works, McKeesport, Pa.:

Monongahela Furnaces: 4 stacks, each 90' x 22'; No. 1 (formerly known as "D") blt. 1907, f. o. Oct. 10, 1907; No. 2 ("C") blt. 1903-05, f. o. Dec. 28, 1905; No. 3 ("A") blt. 1899-90, f. o. Dec. 4, 1890, last rebuilt 1908; No. 4 ("B") blt. 1890, f. o. May 25, 1891, last rebuilt 1906; 10 Massicks and Crooke stoves, 92'-6" x 22' and 7 Cowper-Kennedy stoves 93' 6" x 21'; 9 steam blowing engines; 1 Uehling 4-strand casting machine; 4 slag granulating pits. Molten metal to mixer. Machine shop for own use. Conn. coke; Lake ore. Product: Bessemer pig iron, annual cap., 660,000 tons.

Steel Works and Rolling Mills: Converting Blooming and Slabbing Mills (formerly called Monongahela Steel Works): blt. 1892-93; 3 Bessemer converters (8.8-ton); first steel made Dec. 14, 1893; 3 cupolas; mixer (200-ton); 8 soaking pits; 40" 2-h. 1-st. reversing blooming mill; 40" 2-h. 1-st. universal slabbing mill. Fuel, producer gas. Product and annual cap.: 689,000 tons ingots, 598,000 tons blooms, billets and slabs.

Skelp Mills (formerly called National Rolling Mills): orig. blt. 1878, remod. 1905-06; 18 heating fur.; 16" 2-h. 10-st. continuous skelp; 13" 2-h. 10-st. continuous skelp; 34" x 110" sheared plate mill; 42" universal plate mill. Fuel, coal and producer gas. Machine shop for own use. Product and annual cap.: 526,400 tons steel skelp.

Tube Mills: product, wrought, black pipe and boiler tubes from $\frac{1}{8}$ " to 36" inclusive, annual cap., 445,000 tons. Galvanizing and kalameining dept. at Versailles, Pa., see below.

Foundry: annual cap., 10,200 tons iron castings and 280 tons brass castings.

National Works, Republic Dept., 24th St., South Side, Pittsburgh: blt. 1863, remod. 1906; 44 single puddling fur.; 24 knobbling fires; 5 heating fur., 2 reheating fur.; 22" 3-h. 2-st. muck mill; 22" 2-h. 2-st. forge and breakdown mill; 12" 2-h. 10-st. continuous skelp mill; 4 steam hammers. Fuel, natural gas and coal. Machine shop for own use. Product and annual cap., 32,000 tons muck bar, 28,600 tons charcoal iron skelp and socket iron.

National Works, Galvanizing Dept., Versailles, Pa.: 2 galvanizing tanks for galvanizing pipe.

Pennsylvania Works, Second Ave., Pittsburgh:

Tube Mills: product, wrought pipe from 2" to 16" inclusive, annual cap., 250,000 tons. Thread protector shop making protectors for all the pipe mills.

Riverside Works, Benwood, W. Va.:

Blast Furnaces: 2 stacks: No. 1, blt. 1871-72, blown in Feb. 14, 1872, last rebuilt 1903, 73' 6" x 17'; No. 2, blt. 1901-03, blown in Mar. 12, 1903, rebuilt 1906, 82' 6" x 21'; 8 Massicks and Crooke stoves; 5 steam blowing engines; 1 double-strand Uehling casting machine; 2 slag granulating pits. Molten metal to mixer. Conn. and by-product coke; Lake ore. Machine shop for own use. Product: Bessemer pig iron, annual cap., 233,000 tons.

By-Product Coke Plant, 120 Semet-Solvay ovens, owned by National Tube Co., operated by Semet-Solvay Co. Annual cap., 160,000 net tons coke.

Converting and Blooming Mill: blt. 1883-84; 2 Bessemer converters (5.75-ton); first steel made June 11, 1884; 3 cupolas; mixer (250-ton); 2 soaking pits; 32" 2-h. 1-st. reversing blooming mill. Fuel, producer gas. Machine shop for own use. Product and annual cap.: 216,000 tons ingots, 197,000 tons slabs and billets. Skelp Mills: blt. 1885; 10 heating fur.; 22" 3-h. 3-st. skelp mill. Fuel, producer gas. Product and annual cap., 178,000 tons steel skelp. Tube Mills: Product, wrought black and galvanized pipe from 1/8" to 6" inclusive, annual cap., 157,000 tons. Two galvanizing pots. Foundry: annual cap., 1,930 tons iron castings, 140 tons steel castings.

Syracuse Works, Syracuse, N. Y.: Tube Mills, product, boiler tubes from 2" to 4" inclusive, annual cap., 23,000 tons.

Total annual capacity: 893,000 tons Bessemer pig iron, 905,000 tons Bessemer ingots, 795,000 tons blooms, billets and slabs, 59,000 tons muck bar, 803,000 tons skelp and socket iron, 955,000 tons wrought pipe and boiler tubes, 8,200 tons seamless tubes, 43,550 tons iron, steel and brass castings.

NATIONAL TUBE CO. (of Ohio), The, Lorain, Ohio.

Org. and inc. Dec. 31, 1903.

Subsidiary of the United States Steel Corporation.

William B. Schiller, P.; Edward Worcester, 1 V. P.; Taylor Alderdice, 2 V. P.; B. C. Moise, Sc. & A.; G. E. Benson, T.; John J. Kennedy, G. S. M.; D. H. Ramsbottom, A. G. S. M.; S. M. Lynch, P. A.; Peter Boyd, G. S.; John W. McKee, A. T.; C. B. Foster, A. Sc.; at Frick Bldg., Pittsburgh, Pa. Max M. Suppes, G. M.; at Lorain, Ohio.

Sales offices: National Tube Co. sells all products of The National Tube Co. of Ohio; see list of sales offices listed under that company.

Product: Bessemer and basic pig iron, Bessemer and O. H. ingots, billets, rails and skelp, wrought black and galvanized pipe, gray iron rolls, general loam castings, ingot molds and brass castings.

Works at Lorain, Ohio:

Blast Furnaces: 5 stacks; No. 1, 90' x 22', blt. 1898-99, f. o. July 5, 1899, rebt. 1907; No. 2, 92' 6" x 22', blt. 1898-99,

f. o. Aug. 23, 1899, reblt. 1907; No. 3, 85' x 22', blt. 1903-04, f. o. Sept. 9, 1904; No. 4, 87' 6" x 22', blt. 1903-05, f. o. Feb. 20, 1905; No. 5, 90' x 22', blt. 1907, f. o. Sept. 24, 1907; 16 Cowper fire-brick stoves, 100' x 21'; 3 Cowper fire-brick stoves, 100' x 22'; 4 Massicks and Croke fire-brick stoves, 101' x 22'; 10 steam blowing eng. Flue dust sintering pan, annual cap., 15,000 tons. 2 Heyl and Patterson double-strand casting machines. Conn. coke; Lake ore. Molten metal to mixers. Product: Bessemer and basic pig iron, annual cap., 817,000 tons.

Steel Works and rolling mills: orig. blt. 1894-95; 2 Bessemer converters (12-ton); 6 B. O. H. fur. (75-ton); 3 mixers (200, 200, 425-ton); first Bessemer steel made Apr. 1, 1895; first open hearth steel Jan. 26, 1909; 8 soaking pits; 21 heating fur.; two 38" 2-h. 1-st. reversing blooming mills; 28" 2-h. 3-st. girder rail mill; 28" 2-h. 3-st. reversing skelp; 14" 2-h. 12-st. continuous skelp; 14" 2-h. 14-st. continuous skelp; 34" x 90" sheared plate mill and 30" x 48" universal plate mill used for rolling skelp. First rail rolled Apr., 1895; first skelp rolled Feb. 10, 1905. Fuel, producer gas and coal. Machine shop for own use. Product and annual cap.: 610,000 tons Bessemer ingots, 336,000 tons open hearth ingots, 822,000 tons blooms, slabs and billets, 216,000 tons rails and splice bars, 506,000 tons skelp.

Plan to install, early in 1916, 4 B. O. H. fur. (85-ton), annual cap., 168,000 tons; and 40" 2-h. 1-st. reversing blooming mill, annual cap., 420,000 tons.

Pipe Mills: Product, wrought black and galvanized pipe from $\frac{1}{8}$ " to 20" inclusive, annual cap., 410,000 tons.

Foundry: Product, gray iron rolls, loam castings, ingot molds and brass castings. Annual cap., 18,000 tons ingot molds, 12,000 tons iron castings, 375 tons brass castings.

National Wire Corporation, formerly controlled by National Steel and Wire Co. Plant at New Haven acquired by American Steel and Wire Co. and now known as New Haven Works of that company.

Nelson Valve Co., Chestnut Hill, Philadelphia, Pa., see 1912 Supplement p. 31, added to its works in 1910 one 4-ton A. O. H. fur.; the furnace has not been operated for several years and is considered as abandoned but is not dismantled.

New Birmingham Development Co., Rusk, Texas.

Tassie Belle Furnace at New Birmingham, Texas. 1 charcoal stack, 60' x 11', annual cap., 15,000 tons. *Long idle. For sale.*

New Castle Forge and Bolt Co., see 1908 Directory, p. 306. Works at New Castle, Pa. Plate mill dismantled in 1907; works sold to New Castle Steel and Iron Co. in 1912.

New England Steel Casting Co., see 1908 Directory, p. 234. Works at Hyde Park, Mass., acquired by the Hyde Park Steel Casting Co. in May, 1910.

NEWHALL ROLLING MILL CO., Morris Bldg., Philadelphia, Pa. Thomas S. Gates and Philadelphia Trust Deposit and Insurance Co., assignees.

Works at Hyde, Pa.: blt. 1903, f. o. June 22, 1903; 4 double, 12 single puddling fur.; 1 cont., 2 reverb. heat. fur.; 4 trains (22" 3-h. puddle, 14" 3-h. roughing, 9" finishing, 18" rail). Fuel, bit. coal. (Formerly owned by Clearfield Steel and Iron Co.; acquired by Newhall Rolling Mill Co., June, 1913).

Product: muck bar, skelp, bar iron, and iron and steel rails. Annual cap., 15,000 tons muck bar; 18,000 tons of skelp, or 15,000 tons bar iron; and 20,000 tons of rails.

New Haven Iron and Steel Co., New Haven, Conn.

Org. and inc. 1899. Capital stock: \$500,000.

R. Y. Filbert, P.; Alfred C. Bruner, V. P.; William G. Hollis, Sc. & T.

Works at New Haven, Conn.: blt. 1871; abandoned and partially dismantled.

NEW JERSEY STEEL CO. (The), Drexel Bldg., Philadelphia, Pa.

Dr. Charles H. Holcombe, Receiver, 46 W. State St., Trenton, N. J. G. D. Bouton, William Howard, V. P.; John D. Goff, Sc.; N. M. Carroll, T.

Works at Rahway, N. J.: 3 Tropenas converters (two 4,000-lb. and 1 8,000-lb.); 2 cupolas; 1 25-ton A. O. H. fur. blt. 1905, first O. H. steel made July, 1906. Fuel, coke, fuel oil and coal. (Company went into the hands of receiver, April 27, 1915.)

Product: steel castings, annual cap., 7,000 tons Tropenas and 9,000 tons O. H. steel. *Idle.*

NEW JERSEY ZINC CO. (The), 55 Wall St., New York City.

Inc. Oct. 30, 1880. Capital stock: \$35,000,000; bonds \$4,000,000.

Edgar Palmer, P.; A. P. Cobb, V. P.; J. E. Hayes, Jr., V. P. & G. M.; C. W. Sexton, Sc.; H. S. Wardner, T.; H. G. Clopper, G. S. M.; E. V. Peters, P. A.

The New Jersey Zinc Co. controls The New Jersey Zinc Co. (of Pa.) which operates the blast furnaces described under the name of that company.

NEW JERSEY ZINC CO. (of Pa.) The, Palmerton, Pa.

Org. and inc. Sept. 1, 1886. Capital stock: \$700,000.

Edgar Palmer, P.; A. P. Cobb, V. P.; J. E. Hayes, Jr., V. P. & G. M.; C. W. Sexton, Sc.; H. S. Wardner, T.; E. V. Peters, P. A.; at 55 Wall St., New York. J. A. Singmaster, G. S.; at Palmerton, Pa.

All sales made by The New Jersey Zinc Co., 55 Wall St., New York.

Palmerton Furnaces, Palmerton, Pa.: 2 stacks, No. 1, 60' x 14', blt. 1901-03; f. o. April 5, 1904; Kennedy fire-brick stoves; No. 2, 70' x 14', blt. 1905-06; f. o. Sept. 3, 1906; 4 Kennedy fire-brick stoves; 3 steam blowing eng. (50,000 cfm.); 6 water-tube boilers, 1,536 H. P. Coke: zinc residuum. Machine shop. Foundry for gray iron castings and chills for own use; also plants for the manufacture of zinc oxide, zinc dust, spelter, sulphuric acid and lithopone. Product: spiegeleisen, annual cap., 60,000 tons.

Newark Furnaces, Newark, N. J.: 2 stacks, Furnace A., 31' x 8', blt. 1885; Furnace B., 50' x 12', blt. 1883; were dismantled 1910-11.

South Bethlehem Furnace, South Bethlehem, Pa.: 1 stack, 35' x 9', f. o. Feb., 1882, dismantled 1911-12.

The company owns 6 acres of limestone lands at East Allentown, Pa., on which it operates quarries with an annual cap. of 150,000 tons.

New Louisville Bolt and Iron Co., see 1908 Directory, p. 337, acquired by Louisville Steel and Iron Co., Nov. 1, 1911.

NEWPORT NEWS SHIPBUILDING & DRY DOCK CO., Newport News, Va.

Org. and inc. Jan. 28, 1886. Capital stock: com. \$2,000,000; pref. \$6,000,000.

H. L. Ferguson, P. & G. M.; J. G. Livezey, A.; at Newport News, Va. George E. Miles, Sc. & T.; at 25 Broad St., New York. James Plummer, P. A.; at 233 Broadway, New York.

Works at Newport News, Va.: 1 2-ton Tropenas converter with 1 cupola blt. 1903; first steel made Oct. 1, 1903. Galvanizing department with 2 pots. Fuel, coke.

Product: high grade steel castings up to 6,000 lbs. for own use; iron, brass and bronze castings; also builds and repairs iron and steel vessels, engines, boilers, etc. Annual cap., 1,000 tons steel castings.

NEWPORT ROLLING MILL CO., Newport, Ky.

Org. and inc., 1891. Capital stock: \$750,000.

A. L. Andrews, P. & T.; J. B. Andrews, V. P.; J. G. Andrews, Sc.; A. K. Andrews, G. M.; F. A. Moeschl, G. S. M.; A. W. Hubbard, P. A.

Sales offices:

Dallas, Texas, South Western Life Bldg., Robert Eikel.

Denver, R. E. Pate.

Kansas City, Mo., Rialto Bldg., Edwin M. Miller.

New Orleans, Audobon Bldg., J. T. Lambert.

Phoenix, Arizona Hardware Supply Co.

St. Louis, Security Bldg., E. R. Hensel Steel & Copper Co.

Works at Newport, Ky.: orig. blt. 1857; 10 hot black sheet mills (4 28" x 38"; 2 28" x 36"; 4 29" x 56"); 10 pair and 10 sheet fur.; 2 comb. pair and sheet fur.; 4 cold mills (1 29" x 56"; 3 28" x 38"); 12 box annealing fur.; 2 pickling machines; 8 hand pickling tanks; 8 galvanizing pots. Machine shop for own use.

Product: black and galvanized sheets No. 10 to No. 30 gauge. Annual cap., 52,000 tons. Makes flat and corrugated, painted and galvanized, roofing, siding, etc.

New Process Steel Co., see 1908 Directory, p. 393. Detroit Trust Co. appointed receiver Nov. 16, 1911. Crucible furnaces dismantled. Plant sold to Simons-Leedle Furnace Co. in 1914.

New York State Steel Co., Buffalo, N. Y., see 1908 Directory, pp. 240, 247. Formerly operated blast furnace and rolling mill at Buffalo, N. Y. On April 2, 1913, the company went into the hands of receivers; property was bid in at foreclosure sale, May 25, 1914, by the bondholders committee, and subsequently sold to the Donner Steel Co.

NIAGARA ELECTRIC STEEL CORP., Oliver and Goundry Sts., North Tonawanda, N. Y.

Inc. Feb. 17, 1913. Capital stock: com. auth. \$50,000, issued \$22,000.

Carl A. Houck, P. & T.; T. J. Wilson, V. P.; at North Tonawanda, N. Y. F. G. Kent, Sec., care Lodge & Shipley, Cincinnati, Ohio.

Works at North Tonawanda, N. Y. (leased): $\frac{1}{2}$ -ton Snyder acid single-phase electric steel fur., construction commenced May 30, 1915; first steel made July 1, 1915; charge cold metal, chiefly scrap.

Product: steel ingots and castings for sale for automobile and other machine work, annual cap., 1,500 tons castings.

Niagara Forged Steel Co., see 1908 Directory, p. 247, open hearth furnace dismantled in 1911. Makes forgings.

NICETOWN PLATE WASHER CO., 1824 N. Juniata St., Philadelphia, Pa.

Org. 1900; not inc. Capital \$101,500; bonds \$10,000.

Wheeler Lord, Proprietor.

Works at Nicetown, Philadelphia: blt. 1900; first washer plate rolled, 1902; first bars rolled, 1906; 2 3-d. scrap. heat. fur.; 14 washer machines; 10" 3-h. 4-st. bar mill; 700-lb. ham. Fuel, bit. coal. Machine shop for own use.

Product: iron and steel bars, rounds, flats and squares, also wrought washers and punched work of all kinds. Annual cap., 10,000 tons of bar iron and 20,000 kegs (200-lb.) of washers.

Niles Iron and Steel Co. (The), see 1908 Directory, p. 357. The Thomas Steel Co. acquired The Niles Iron and Steel Co. and The Niles Corrugating Co. both of Niles, Ohio, Feb. 1, 1909.

Nittany Iron Co., see 1908 Directory, p. 286. Blast furnace at Bellefonte, Pa., sold at assignee's sale June 27, 1914. Present owner intends to dismantle furnace.

NOBLE ELECTRIC STEEL CO., 995 Market St., San Francisco, Cal.

Org. July 25, 1907, amended Nov. 6, 1914. Capital stock: com. auth. \$1,000,000, issued \$790,860; pref. 8% cum. auth. \$500,000, issued \$70,030.

H. H. Noble, P.; E. H. Nuhrenburg, V. P.; E. E. Mead, Sc.; at San Francisco.

Works at Heroult, Cal.: 5 Heroult electric fur.; first pig iron made July, 1907. Electricity and charcoal and coke; local magnetite ore from own mines, $1\frac{1}{2}$ miles from plant, also limestone quarries. Product: foundry pig iron, ferro-silicon, ferro-manganese, and ferro-chrome, annual cap., 4,500 tons.

Norfolk Iron Co., see 1908 Directory, p. 329. Rolling mill at Tidewater Jc., near Norfolk, Va., acquired at trustee's sale July 15, 1911, by the Boston Iron and Metal Co., of Baltimore, Md. Plant leased to Virginia Steel Co., Jan. 1, 1912; abandoned and in process of being dismantled in 1914.

North Alabama Rolling Mill Co., Sheffield, Ala.

Org. and inc. Aug., 1909. Capital stock: \$150,000.

Sheffield Rolling Mill at Sheffield, Ala.: 10 puddling fur.; 2 busheling fur.; 18" muck mill, 16" merchant bar and 10" merchant bar mills. Cotton tie mill dismantled in 1909. *Idle for several years.* Product: merchant bar iron.

North American Steel Co., see 1908 Directory, p. 332. Plant at Belington, W. Va., sold to D. A. Nease of San Antonio, Texas, Jan. 13, 1908; acquired by George C. Sturgess, April, 1912; acquired by Mountain State Investment Co., Nov. 22, 1913; machinery sold and plant dismantled in 1913-14.

NORTHERN ALABAMA COAL, IRON AND RAILWAY CO., 25 Broad St., New York.

E. Thalmann, P.; F. I. Rubidge, V. P. & G. M.; W. J. Kingsbury, Sc. & T.; at New York. George R. Williams, A.; at Talladega, Ala.

Talladega Furnace at Talladega, Ala.: 1 stack; blt. 1889, remod. 1900-01; 72' x 18'; 3 Whitwell stoves, 62' x 26'. Coke; local brown and red ore. Annual cap., 70,000 tons of foundry pig iron. *Last active in 1903.*

Company owns 182 bee-hive coke ovens at the furnace; also operates Hammond iron ore mines at Hammond, Ga.

NORTHERN IRON CO., Port Henry, N. Y.

Org. and inc. Mar. 27, 1902. Capital stock: com. auth. \$300,000, issued \$250,000.

T. I. Crane, P.; W. S. Pilling, Sc. & T.; at Real Estate Trust Bldg., Philadelphia, Pa. W. G. Updegrave, A.; G. P. Pilling, F. S.; at Port Henry, N. Y. L. P. Ross, G. M.; J. F. Powell, F. S.; at Standish, N. Y.

Selling agents: Pilling & Crane.

Brands: "Essex" and "Chateaugay."

The company operates under lease two blast furnace plants.

Northern or Cedar Point Furnace at Port Henry: 1 stack; blt. 1872-3; rebt. 1912; 80' x 17'; relined 1914 to 80' x 16'; 3 Cowper stoves, 81' x 16', 2 McClure stoves 95' x 20'; 2 old vertical and 1 turbine steam blowing eng. (25,000 cfm.); 6 water-tube boilers, 1,756 H. P. Coke; local magnetic ore. Limestone quarries at Port Henry, N. Y., with an annual cap. of 20,000 tons. Machine shop for own use. (Owned by Witherbee, Sherman & Co., Inc.)

Product: Bessemer, basic, malleable, and foundry pig iron, annual cap., 75,000 tons.

Standish Furnace, Standish, N. Y.: 1 stack, blt. 1886, last rebt. 1905; blown in Nov. 5, 1905; 80' x 15'6"; 4 Cowper stoves, 71' x 16'; 2 steam blowing eng. (22,000 cfm.); 6 water-tube boilers, 1,756 H. P. Coke; local magnetic concentrates. Machine shop for own use. (Owned by Delaware and Hudson Co., Chateaugay Ore and Iron Department.)

Product: Bessemer, low-phosphorus, and malleable pig iron, annual cap., 69,000 tons.

Northern Iron and Steel Co., open hearth steel works and rolling mill at Collingwood, Ont., see Canadian Supplement, p. 16. The company went into voluntary liquidation in 1907 and the plant was subsequently sold under foreclosure proceedings to Frank B. Baird of Buffalo, N. Y. Plant leased on December 1, 1915, to Wm. Kennedy & Sons, Ltd.

Northwestern Barb Wire Co., see Dillon-Griswold Wire Co.

Northwestern Electric Castings Co., see Bentley-Snyder Co.

NORTHWESTERN IRON CO. (The), Milwaukee, Wis.

Inc. 1854. Capital stock: \$2,500,000.

Ferdinand Schlesinger, P.; Henry J. Schlesinger, 1 V. P.; Armin A. Schlesinger, 2 V. P. & T.; Wilmot Saeger, Sc.; Herbert H. Springfield, A.; at Milwaukee. John H. Means, G. M.; at Mayville, Wis.

Selling agents: Pickands, Brown & Co.

Brands: "Mayville," "Sydney," "Gertrude."

Mayville Furnaces at Mayville, Wis.: 2 stacks. Furnace A, blt. 1848, last rebt. 1910, 80' x 18'; 4 stoves, 77' x 20' (3 Foote, 1 McKee); Furnace B, blt. 1905-07, f. o. May 2, 1907, 77' x 20'; 4 Julian Kennedy stoves, 77' x 20'; 5 steam blowing eng. (3 high, 2 low, pressure); 15 boilers (6 water-tube, 9 tubular); 1 double-strand Uehling casting machine; 1 slag granulating pit; Gröndal ore briquetting plant; Greenawalt flue dust sintering plant.

Gayley dry air plant serves both furnaces. By-product coke plant with 36 Otto-Hoffmann ovens, by-product recovery plant and benzol plant.

Company owns the Iron Ridge Mine, 5 miles from furnace. By-product coke from own ovens and from Milwaukee; Lake and Iron Ridge ore.

Product: malleable, Bessemer and foundry pig iron, annual cap., 180,000 tons.

Nortmann-Duffke Foundry Co., Milwaukee, Wis., see 1908 Directory, p. 398; crucible steel furnaces dismantled in 1913.

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, 66' x 16', 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.); 8 water-tube boilers, 2,500 H. P. Coke; Lake ore.

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

Works at Ashland: f. o. Mar. 1874; burned and rebld. 1883; 2 2-d. heat. fur., 2 Smith gas fur.; 1 train (22' 2-h. 2-st.); 126 cut nail machines, 50 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.

Norwalk Steel and Iron Co., see 1908 Directory, p. 373. Steel works and rolling mill at Norwalk, Ohio, were leased to American Steel and Iron Co., Dec. 10, 1907. The property of the Norwalk Steel & Iron Co. was sold in Feb., 1909, by the trustee in bankruptcy to the Huron Steel and Iron Co., a reorganization of the American Steel and Iron Co., lessee of the works. Receivers for the Huron Steel and Iron Co. were appointed Jan. 27, 1910. The plant was leased for 6 months to the Galesburg Coulter Disc Co., Jan. 22, 1910. On June 25, 1910, it was sold to the Assets Realization Co. of Camden, N. J.; and on July 11, 1910, acquired by the Crucible Steel Co. of America and is now known as the Norwalk Works of that company.

NOVA SCOTIA STEEL AND COAL CO., Ltd., New Glasgow, Nova Scotia.

Est. 1872; inc. 1900. Capital stock: com. \$7,500,000; pref. 8% cum. \$1,000,000.

Thomas Cantley, P. & G. M.; J. D. McGregor, V. P.; Archibald McColl, Sc.; Thomas Green, T.; Walter G. Stanfield, P. A.; at New Glasgow. W. D. Ross, V. P.; at Toronto. Thomas J. Brown, G. S.; at Sydney Mines, C. B. John Irving, G. S. M.; at Room 14, Windsor Hotel, Montreal.

Sales office: Montreal, Windsor Hotel.

Brand: "Scotia."

Scotia Furnace, Sydney Mines, N. S.: 1 stack, 85' x 18' 10"; blt. 1902-04, f. o. Aug. 30, 1904; 4 Roberts stoves, 85' x 18'; 2 steam blowing eng. (30,000 cfm.); 6 water-tube boilers, 1,632 H. P.; 1 Uehling single-strand casting machine. Molten metal to mixer at Sydney Mines Steel Works.

Product: basic pig iron for own use and foundry pig iron for own use and for sale; annual cap., 90,000 tons.

By-product coke plant: 30 Bauer and 120 Bernard ovens, annual cap., 110,000 net tons. Surplus gas used under boilers; by-products not recovered. Boiler plant comprises 3 water-tube, 5 return-tubular boilers, 1,555 H. P.

Sydney Mine Steel Works, Sydney Mines, N. S.: blt. 1904-05; 4 B. O. H. fur. (3 40-ton, 1 50-ton); 200-ton mixer; 18 gas producers (16 Duff, 2 12' mechanical Chapman). Ingots shipped to New Glasgow and rolled or forged into finished forms. Fuel, mfd. gas. Adding one B. O. H. fur. (40-ton) annual cap., 30,000 tons ingots.

Product and annual cap.: 110,000 tons of ordinary and fluid compressed steel ingots from 3 to 30 tons.

New Glasgow Works, New Glasgow, N. S.: blt. 1872; O. H. steel dept. added 1882 and dismantled 1906; rolling mill dept. added 1883 and f. o. Aug., 1883; 15 forge fires; 15 heating fur. (12 coal, 3 gas); 28" 2-h. 1-st. cogging; 20" 3-h. plate; 18" 3-h. 2-st. roughing with 9" 3-h. 6-st. finishing; 9" 3-h. 7-st. guide; 5 ham. (10-cwt. to 5-ton); 2 forging presses (500 and 3,000-ton); 2 automatic spike machines. Machine shop for own use and jobbing. Structural shops, shops for building engines, etc. Fuel, bit. coal.

Product: mining and tram rails from 12 to 40 lbs., fish plates, tie plates, angle bars, machinery, car, spring and agricultural implement steel, tank plates, angles, flats, iron and steel merchant bars, railway, marine and engine forgings up to 15 tons, railroad spikes, cold drawn polished shafting and car axles. Annual cap., 60,000 tons of finished rolled and forged products and 7,500 tons of railway spikes.

The company also owns and controls the Eastern Car Co., at New Glasgow, which builds steel and wooden cars, makes car wheels, etc.

The company owns extensive coal properties at Sydney Mines, Nova Scotia upon which the Princess, Lloyds, Florence, Scotia, and Queen mines are operated, total annual capacity, 800,000 tons; valuable ore property comprising 4 square miles subterranean and $82\frac{1}{2}$ square miles submarine ore lands at Bell Island, Conception Bay, Newfoundland, upon which is the Wabana Mine with an annual cap. of 600,000 tons; limestone lands, 120 acres, at Point Edward, Nova Scotia, with a quarry of 70,000 tons annual cap.; also owns 16,773 acres of timber and other lands in Pictou and Colchester Counties, Nova Scotia, and leases 3,422 acres of such land in Pictou County, Nova Scotia, and 49,600 acres at Gander Bay, Newfoundland.

Oakley Steel Foundry Co., see Worcester Steel Foundry Co. and Millbury Steel Foundry Co.

Ohio Crucible Steel Co., Cleveland, Ohio, see 1910 Supplement p. 26; corporate title changed to The Atlas Steel Foundry Co. on Apr. 12, 1912; crucible and A. O. H. furnaces dismantled Jan., 1914; acquired by Atlas Foundry Co., Jan. 1, 1914. Make gray iron castings only.

OHIO FALLS IRON CO., New Albany, Ind.

Org. and inc. Aug., 1898. Capital stock: \$100,000.

George M. Clark, P.; C. E. Clark, T.; J. T. Clark, G. M.; George W. Westerkamp, A.; Edward S. Short, G. S.; at New Albany, Ind. Maurice Joseph, V. P.; David J. Workum, Sc.; at Cincinnati, Ohio.

Brand: "Ohio Falls."

Works at New Albany, Ind.: orig. blt. 1866; 15 single puddling fur.; 9 scrap fur.; 6 heat. fur.; 2 squeezers; 1 5-ton ham.; 5 trains (20" 3-h. 2-st. and 18" 2-h. 2-st. muck; 16" 2-h. 3-st., 10" 3-h. 5-st. and 8" 3-h. 5-st. finishing). Fuel, coal.

The company acquired the plant of the Licking Rolling Mill Co., at Covington, Ky., in July, 1912; partly dismantled.

Product: angles, light rails, and bar iron for bridge works, car works, and railroads; specialties, wide flats up to 12" and iron square root angles for safe works, annual cap., 50,000 tons.

OHIO IRON AND STEEL CO. (The), Lowellville, Ohio.

Org. Nov., 1879; inc. Feb. 9, 1880. Capital stock: \$2,000,000.

Robert Bentley, P. & G. M.; John C. Wick, V. P.; Frederick H. Wick, T.; Frank D. Zug, A.; at Youngstown, Ohio. David Davis, Sc.; at Lowellville, Ohio.

Selling agents: Chicago, Pickands, Brown & Co.; Cleveland, Pickands, Mather & Co.; Pittsburgh, H. G. Dravo.

Brands: "The Mary," "The Mary Ohio Scotch."

Mary Furnace, Lowellville, Ohio: 1 stack, 85' x 18', blt. 1845, last remod. 1898; 5 Cowper-Kennedy hot blast stoves (4 80' x 18' and 1 80' x 20'); 3 steam blowing eng. (30,000 cfm.); 8 water-tube boilers, 3,600 H. P. Conn. coke; Lake ore. 1 Heyl & Patterson single-strand pig iron casting machine; 1 slag gran. pit, annual cap. 90,000 tons. Machine shop for own use.

Product: Bessemer, basic, forge and foundry pig iron, annual cap., 150,000 tons.

Ohio Rail Co. (The), see 1908 Directory, p. 372, formerly owned plant for rerolling rails at Newark, Ohio. Plant sold June 26, 1909, to The Buckeye Rolling Mill Co.

OHIO SEAMLESS TUBE CO. (The), Shelby, Ohio.

Org. and inc., 1908. Capital stock: \$1,000,000.

G. M. Skiles, P.; E. W. Wiggins, V. P.; James A. Brubaker, Sc. & T.; A. C. Morse, G. M.; H. E. Brubaker, P. A.

Sales offices: Chicago, 1150 Peoples Gas Bldg.; Cleveland, 1017 B. of L. E. Bldg.; Detroit, 913 Ford Bldg.; New York, 2 Rector St.

Works at Shelby, Ohio: blt. 1908-09 on site of burned Shelby Steel Tube Co. works; first products rolled, Feb., 1909; first tubes drawn, May, 1909; 6 billet heat. fur.; 2 piercing machines; 18 drawing benches; 1 train, four 20" 2-h. mills; 5 ham. (350 to 800-lb.) Fuel, bit coal.

Product: steel blanks for use in the manufacture of seamless drawn tubes; cold drawn tubes, $\frac{1}{2}$ " to 6", annual cap., 24,000 tons.

OHIO STEEL FOUNDRY CO. (The), Lima, Ohio.

Org. and inc. Jan., 1907. Capital stock: \$600,000.

Harry Wright, P.; John E. Galvin, V. P.; John W. Kaufman, Sc.; John R. Hastings, G. S. M.; J. T. Kaufman, P. A.

Sales office: Chicago, Ill., 617 Railway Exchange Bldg.

Works at Lima, Ohio: blt. 1907, f. o. Sept. 21, 1907, 1 25-ton stationary A. O. H. fur.; 2 annealing pits. Fuel, oil. (1 15-ton B. O. H. fur. blt. 1907; dismantled 1909.)

Product: steel castings for sale for locomotives, cars, engines, and miscellaneous machinery, also vanadium and titanium alloy steel castings, annual cap., 15,000 tons.

Oklahoma Rolling Mill Co., Guthrie, Oklahoma, see 1912 Supplement, p. 52; projected rolling mill at Guthrie not completed; foundations laid and machinery shipped to this point but not installed; machinery subsequently shipped to Fort Smith Iron & Steel Co., Arkoma, Oklahoma.

OLD DOMINION IRON AND NAIL WORKS CO., Richmond, Va.

Frank Jay Gould, P.; Thomas S. Wheelwright, V. P. & G. M.; H. R. Wayt, Sc. & T.

Brands: "Old Dominion" bar iron; "Hammer Brand" horseshoes.

Works on Belle Isle, Richmond: 10 double puddling fur.; 13 heat. fur.; squeezer; 5 trains (20", 18", 12" roughing with 9" finishing, 10", 9"). Fuel, bit. coal and coke. Steam and electric power. Adding two 4-ton Rennerfelt electric steel fur., annual cap., 12,000 tons ingots.

Product: muck bar, merchant bar iron, steel wagon tires, horse and mule shoes, railroad spikes, bolts, nuts, washers, harrow teeth, etc., annual cap., 60,000 tons.

OLIVER CHILLED PLOW WORKS, South Bend, Ind.

Org. and inc. Oct. 14, 1901. Capital stock: \$500,000.

Joseph D. Oliver, P. & G. M.; James Oliver, V. P.; George Ford, Sc.; Joseph D. Oliver, Jr., T.; C. W. Moore, G. S.; W. A. Weed, Jr., G. S. M.; A. A. Frederick, P. A.

Works at South Bend, Ind.: 1 2-ton Whiting converter with 1 cupola; construction commenced Feb. 1, 1913; completed and f. o. Mar. 1, 1913. Fuel, coke. Machine shop for own use. (8 4-pot crucible fur., blt. 1891, dismantled 1914.)

Product: steel castings for own use, also malleable and gray iron castings. Annual cap., 150 tons steel, 10,000 tons malleable, 25,000 tons gray iron.

OLIVER IRON AND STEEL CO., South 10th and Muriel Sts., Pittsburgh, Pa.

Org. and inc. Nov. 9, 1887. Capital stock: com. \$1,600,000.

John C. Oliver, P.; Henry Oliver, V. P.; Ralph Theophilus, T.; Chas. E. Black, Sc. & P. A.; J. F. Johnston, A.; James C. Rea, G. M.

Works at Pittsburgh: blt. 1863; 4 trains (8" 3-h. 4-st., 10" 3-h. 6-st., 16" 3-h. 3-st. bar; 11" comb. cont. mill with 12-st. 2-h. cont. and 4-st. finishing); 8 heat. fur. (4 3-d., 1 4-d., 3 cont.); 5 steam ham. (1,000 to 1,500-lb.); 5 drop ham., 2 forging presses. Bolt and nut department. Galvanizing department with 2 pots to galvanize telephone and telegraph pole line hardware forgings for power transmission lines, bolts, nuts and washers. Fuel, nat. gas.

Product: bars and special shapes for own use; track, carriage, and machine bolts, and coach screws up to 3½" dia., any length; nuts, ¼" to 2½", hex. and square; rivets ⅜" and up; washers ⅜" and up; hinges, wagon hardware, railway car forgings, railway track tools, telegraph pole equipment, picks, mattocks, crowbars, and wedges, etc. Annual cap., 95,000 tons rolled products, 800,000 kegs bolts, 139,200 kegs nuts, 95,000 kegs rivets, 28,000 kegs washers.

OLIVER IRON MINING CO., Wolvin Bldg., Duluth, Minn.

A subsidiary of the United States Steel Corporation.

W. J. Olcott, P.; Pentecost Mitchell, V. P.; G. D. Swift, Sc. & A. T.; W. W. Watson, A. Sc.; J. T. Melvin, 2 A. T.; J. L. Mullin, A.; W. J. O'Connor, A. A.; J. H. McLean, G. M.; J. H. Harding, A. G. M.; S. S. Rumsey, C. E.; J. U. Sebenius, G. M. E.; R. E. Mace, P. A.; at Duluth. C. E. Scheide, T.; J. M. Sias, A. T. & 2 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 Company operates under agreement the active mining properties of the Minnesota Iron Company, the

Lake Superior Consolidated Iron Mines, the American Mining Company, the Chapin Mining Company, 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:

Menominee Range:

Aragon Mine
Chapin Mine
Cottrell Mine
Cuff Mine
Iron Ridge Mine
Riverton Group:
 Dober Mine
 Isabella Mine
Pewabic Mine ($\frac{1}{2}$)

Marquette Range:

Adams Mine
Champion Mine
Lake Superior Group ($\frac{3}{4}$):
 Section 16 Mine
 Section 21 Mine
 Hard Ore Mine
 Hematite Mine
Moore Group:
 Moore Mine
 Richards Mine
Queen Group ($\frac{3}{4}$):
 Prince of Wales Mine
 Blue Mine
Stegmiller Mine
Winthrop Mine

Gogebic Range:

Davis Mine
Geneva Mine
Norrie-Aurora Group:
 North Norrie Mine
 East Norrie Mine
 Pabst Mine
 North Pabst Mine
 Aurora Mine
 North Aurora Mine
 Vaughn Mine
North Newport Mine
Royal Mine
Puritan Mine
Tilden Mine

Vermilion Range:

Pioneer Mine
Savoy Mine
Sibley Mine
Zenith Mine
Soudan Mine

Baraboo Mining District:

Iroquois Mine

Mesabi Range:

Virginia District:
 Deacon Mine
 Higgins Mine
Mountain Iron Group:
 Mountain Iron Mine
 Aetna Mine
Ordean Mine
Prindle Mine
Sauntry-Alpena Group:
 Sauntry Mine
 Alpena Mine
Shiras Mine
Stephens Mine
Union Mine ($\frac{1}{2}$)
Virginia Group:
 Mesabi Mountain Mine
 Lone Jack Mine
 Ohio Mine
 Wanless Mine
Adams District:
 Adams Group:
 Adams Mine
 Hull Mine
 Nelson Mine
 Leonidas Mine
 Auburn Mine
 Minnewas Mine
 Norman Mine
Spruce Group:
 Spruce Mine
 Cloquet Mine
 Park Lot Mine

Mesabi Range:

Fayal District :
 Duluth Mine
 Fayal Mine
 Genoa Group :
 Genoa Mine
 Sparta Mine
 Gilbert Group :
 Gilbert Mine
 Elba Mine
 McKinley Mine
 Canton Mine
 Biwabik Mine ($\frac{1}{4}$)
 Graham-Vivian District :
 Graham Mine
 Weed Mine
 Hibbing District :
 Burt-Pool Mine
 Carson Lake Mine
 Day Mine
 Donora Mine
 Hull-Rust Mine
 Morris Mine
 Penobscot Mine
 Philbin Mine
 Sellers Mine
 Sheridan-Day Mine
 Winifred Mine
 Mahoning Mine ($\frac{1}{5}$)

Mesabi Range:

Chisholm District :
 Chisholm Mine
 Chester Mine
 Clark Mine
 Duncan Mine
 Hartley Mine
 Humphreys Mine
 Leonard Group :
 Burt Mine
 Glen Mine
 Monroe-Tener Mine
 Myers Mine
 Pillsbury Mine
 St. Clair Mine
 Sharon Mine
 Canisteo District :
 Arcturus Mine
 Canisteo Group :
 Canisteo Mine
 Walker Mine
 Holman Group
 Holman Mine
 Brown No. 1 Mine
 Brown No. 2 Mine
 Diamond Mine
 Hill Group :
 Hill Mine.
 Delaware Mine
 Judd Mine

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. These contain large quantities of ore yet unopened, and substantial tracts of standing timber held for future use in mining operations.

OLYMPIC STEEL WORKS, Seattle, Wash.

Org. and inc. July 10, 1915. Capital stock: auth. \$20,000, issued \$10,000.

C. W. Kucher, P.; George P. Barton, V. P.; Albert E. Greene, Sc. & T.

Works at Georgetown Station, Seattle: one 1-ton Greene electric fur.; first steel made Nov. 5, 1915.

Product: electric steel castings for sale for machinery and special purposes; vanadium and manganese alloy steel castings; annual cap., 500 tons.

Ontario Iron and Steel Co., Ltd., see Canadian Supplement, p. 16, merged in Canadian Steel Foundries, Ltd., Jan. 1, 1911.

Oostburg Steel Foundry Co., see 1908 Directory, p. 398. Plant closed down and company dissolved in Sept., 1911.

Oregon Iron and Steel Co. (The), 500 Concord Bldg., Portland, Ore. William M. Ladd, P.; Edward Cookingham, V. P.; A. S. Pattullo, Sc. & G. S.

Owens and operates a cast iron pipe foundry.

Oswego Furnace, Oswego, Oregon: 1 stack, 60' x 13', blt. 1888; f. o. Oct., 1888; 3 Whitwell stoves, annual cap., 15,000 tons. *Furnace idle since 1894.*

ORISKANY ORE AND IRON CORP., Covington, Va.

Org. and inc. June, 1908. Capital stock: com. \$500,000; pref. 7% cum. auth. \$250,000, issued \$87,500.

Randolph Harrison, P.; W. W. Taylor, V. P., Sc. & G. M.; at Lynchburg, Va.

Selling agents: Crocker Bros.

Brand: "Oriskany."

Furnace at Lynchburg, Va.: 1 stack, 80' x 16', construction commenced Mar., 1912, completed and f. o. June 30, 1913; 4 Hartman stoves, 70' x 18'; 2 Southwark steam blowing eng. (30,000 cfm.); 4 water-tube boilers, 1,600 H. P. Coke; local brown and magnetic ores, blue billy. Company owns iron ore mines at Pitts-ville, Va., with an annual cap. of 40,000 tons. Operates a sintering plant.

Product: high-manganese foundry and forge pig iron, annual cap., 50,000 tons.

OSAGE IRON & STEEL CO., Sand Springs, Oklahoma.

Org. and inc. Dec. 4, 1915. Capital stock: \$64,000; bonds, \$30,000. Barney Smith, P. & G. M.; G. W. Armstrong, V. P.; Rufus A. Colgin, Sc. & S.

Works at Sand Springs: blt. 1911-12, f. o. Dec. 27, 1913; 2 2-d. heat. fur.; 14" 3-h. 2-st. roughing, 10" 3-h. 4-st. Belgian finishing. Fuel, natural gas. (Formerly owned by Pioneer Iron & Steel Co.; acquired by Charles Page in 1914; acquired by present owners, Jan. 1, 1916).

Product: merchant bar iron and reinforcing steel, annual cap., 10,000 tons.

Osterberg Tin Plate Co. (The), see Waynesburg Forge, Sheet and Tin Mills and American Steel Co.

OTIS ELEVATOR CO., 250 11th Ave., New York, N. Y.

Org. and inc. Nov. 28, 1898. Capital stock: com. auth.: \$10,000,-000, issued \$6,375,300; pref. \$6,500,000; bonds \$3,300,000.

W. D. Baldwin, P.; A. G. Mills and F. C. Furlow, V. P.; W. G. McCune, T.; D. F. Hamon, A.; W. E. Hodgman, P. A.; at 250 11th Ave., New York City. C. G. Comstock, V. P.; at Cleveland, Ohio. G. R. Rebmann, V. P.; at 12th & Sansom Sts., Philadelphia, Pa. E. A. Russell, V. P.; at 600 W. Jackson Boulevard, Chicago, Ill.

Sales offices in all large 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. Works at Chicago, Ill., with small steel foundry, see 1908 Directory, p. 387, were discontinued in Dec., 1914.

Buffalo Works, Northland Ave. & Grider St., Buffalo, N. Y.: commenced adding Mar. 1, 1913, 1 Stock oil-fired steel converter; never completed; abandoned. 2 2-ton Snyder electric fur.; 1 with acid lining, construction commenced Jan. 15, 1914, completed and f. o. Mar. 16, 1914; 1 with basic lining blt. Dec., 1914; completed and f. o. April, 1915. Machine shop for own use. Product: steel castings for own use, annual cap., 10,000 tons.

OTIS STEEL CO. (The), Cleveland, Ohio.

Org. 1873; inc. Jan. 3, 1912. Capital stock: com. auth. \$5,000,000, issued \$4,409,800; pref. 7% cum. auth. \$5,000,000, issued \$2,730,900; bonds \$5,000,000.

G. Bartol, P. & T.; H. E. Higgins, V. P.; H. F. Deverell, Sc. Brand: "Otis."

Lakeside Works, Cleveland, Ohio: blt. 1873-74, f. o. in fall of 1874; 3 A. O. H. fur. (1 15-ton, 2 20-ton); 5 B. O. H. fur. (30-ton); first A. O. H. steel made Oct. 23, 1874; first B. O. H. steel made Jan. 20, 1886; 30" 2-h. 1-st. blooming mill; 42" x 152" 3-h. 1-st. and 31" x 112" 3-h. 1-st. plate mills; 7 Siemens heat. fur. (4 4-d., 3 5-d.); 2 ham. (6,000 and 4,000-lb.) Fuel, nat. and prod. gas and coal. Product and annual cap.: 20,000 tons acid; 90,000 tons basic open hearth ingots, 25,000 tons steel castings for sale (23,500 acid, 1,500 basic), 70,000 tons sheared plates and 5,000 tons of forgings.

Riverside Works, Cleveland, Ohio: blt. 1913-14; f. o. Sept., 1914; 30" x 72" plate mill; 30" x 62"-72", 30" x 44"-54" and 30" x 38"-44" jobbing mills; 4 port. heat. fur.; 3 bridge heat. fur.; 30" x 48" and 30" x 72" cold rolls; 3 Costello fur.; 2 sheet fur., 1 box annealing fur.; pickling and liming pits; patent leveler; 2 circle and 6 straight shears. Machine shop for own use. Fuel, nat. and prod. gas and bit. coal. Product: sheared plates, light plates and sheets to 18 gauge in all standard finishes. Annual cap., 65,000 tons of light plates and 35,000 tons of sheets.

Ottawa Steel Casting Co., Ltd. (The), Ottawa, Ont., Canada. See Canadian supplement p. 16. Works at Ottawa: blt. 1904-05, abandoned in 1914 and dismantled.

Oxford Iron and Steel Co., Oxford, N. J.

Works at Oxford, N. J.: 1 Wills converter; 2 cupolas; gray iron foundry. Abandoned. (Formerly owned and operated by American Steel Corpn.; acquired by Oxford Iron and Steel Co. in 1910.)

PACIFIC COAST STEEL CO., Rialto Bldg., San Francisco, Cal.

Org. and inc. May 13, 1909. Capital stock: com. auth. \$500,000, issued \$409,000; pref. 6% cum. auth. \$500,000, issued \$409,000; bonds \$850,000.

E. M. Wilson, P. & T.; D. P. Doak, V. P.; E. S. Houdlette, A. & A. Sc.; J. C. Wallace, Jr., P. A.; John B. Leonard, District G. S. M.; D. E. McLaughlin, Southern G. S. M.; S. S. Lawrence, Foreign G. S. M.; at Rialto Bldg., San Francisco, Cal. William Pigott, V. P.; W. S. Burt, Sc.; at Seattle, Wash.

Sales offices: Los Angeles, Cal.; Seattle, Wash.

Product: ingots; merchant bar iron and steel; flats, rounds, squares; light rails (8 to 20 lb.); angles, channels, and tees.

South San Francisco Works, South San Francisco, Cal.: blt. 1910-11; 3 B. O. H. fur. (30-ton); first steel made Jan. 2, 1912; first products rolled, Jan. 29, 1912; 2 cont. billet heat. fur.; 2 trains (22" 3-h. 3-st.; 10" with 4-st. 3-h. and 1 st. 2-h.). Fuel, oil. Machine shop for own use. Product: steel ingots, bars, angles, channels and tees for sale; also gray iron, steel and semi-steel castings for own use only. Annual cap., 45,000 tons ingots, 40,000 tons rolled products, 500 tons semi-steel, 700 tons gray iron and 200 tons steel castings.

Seattle Works, Youngstown, Wash.: blt. 1904-05; f. o. May 6, 1905; 2 40-ton B. O. H. fur.; first steel, made Sept. 30, 1915; 3 busheling fur.; 4 4-d. heat. fur.; 1 cont. rail heat. fur.; 4 trains, (22" 3-h. 3-st. combined billet and structural, 16" 3-h. 3-st., 12" 3-h. 5-st., 9" 3-h. 5-st. merchant bar). Fuel, petroleum. Machine shop for own use. (Formerly owned and operated by Seattle Steel Co.; acquired by present owners Jan. 1, 1911, but operated by Seattle Steel Co. until Jan. 1, 1912.) Part of O. H. equipment and 22" mill were formerly in Irondale Works which were dismantled in 1914. Product: ingots, bar iron, flats, rounds, squares and 8, 12, 16 and 20-lb. T-rails; also angles and channels from old steel rails, annual cap., 50,000 tons ingots and 55,000 tons rolled products.

Portland Works, Portland, Oregon: blt. 1892; f. o. Sept., 1892; 2 4-d. heat. fur.; 2 busheling fur.; 2 trains (9" 3-h. 5-st. guide, 16" 3-h. 3-st. merchant bar.) Fuel, crude oil. (Formerly owned by Pacific Hardware & Steel Co.; acquired by present owners on Oct. 1, 1911.) Product: bar and band iron, annual cap., 12,000 tons. *Idle.*

Irondale Works, Irondale, Washington:

Irondale Furnace: 1 stack, blt. 1880-81, last rebt. 1906-07; 60' x 11'; closed top; 2 iron stoves; 2 steam blowing eng.; 3

tubular boilers. Coke; magnetite and bog ore. Product: foundry pig iron, annual cap., 24,000 tons. *Abandoned but not dismantled.* Steel plant and rolling mill at these works dismantled and part of equipment installed in Seattle Works at Youngstown, Washington. (Formerly owned and operated by Irondale Furnace Co. and Irondale Steel Co.; acquired by Western Steel Corporation, Nov. 15, 1909; acquired by present owners, July 1, 1914.)

Pacific Hardware and Steel Co. of N. J. was reincorporated in California, Jan., 1910; acquired by the Pacific Coast Steel Co., Oct. 1, 1911.

Pacific Jupiter Steel Co., see 1908 Directory, p. 406, became insolvent in 1910. Plant operated for a while by American Steel Casting Co., which took over the property on April 1, 1910. Subsequently reverted to bondholders. Machinery sold and removed in 1911.

Pacific Steel and Wire Co., see 1908 Directory, p. 111, formerly controlled by National Steel and Wire Co.; plant purchased by American Steel and Wire Co. in Feb., 1909, and dismantled.

PAGE WOVEN WIRE FENCE CO., Adrian, Mich.

Org. 1886, inc. Dec. 11, 1901. Capital stock: com. \$1,000,000; 1st pref. auth. \$1,200,000, issued \$800,000 (\$14,000 in treasury); 2nd pref. \$1,000,000 (\$200,500 in treasury); bonds \$394,000.

Austin Clement, P.; Arthur B. Cody, Sc.; at Chicago, Ill. J. Wallace Page, V. P.; J. N. Podrasnik, V. P.; John E. Carr, T.; Geo. L. Bennett, M.; E. T. Crowe, P. A.; Thomas J. Collins, A.; Robert Darnton, G. S. M.; at Adrian, Mich. E. C. Sattley, G. M.; H. A. Yates, P. A.; at Monessen, Pa.

Sales offices: Adrian, Mich.; Chicago, Ill., 205 W. Monroe St.; Monessen, Pa., J. K. Boll; New York City, 30 Church St. (domestic) and 92 Beaver St. (foreign).

Brands: "Page," "New-Page," "Lion."

Monessen Plant, Monessen, Pa.: blt. 1899-1900, first steel made, May 31, 1900; first rods rolled, June 18, 1900; 2 60-ton stationary B. O. H. fur.; 2 2-d. Morgan reheat. fur.; 25" 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; 1 steam ham., 1,500-lb.; 212 wire drawing blocks, for wire to 20 gauge, 3 galvanizing fur. with an annual cap. of 25,000 net tons of wire; 81 machines for barbed and woven wire fence. Machine shop for own use. Fuel, bit. coal and nat. gas.

Product: ingots, wire rods, plain and galvanized wire, barbed wire, woven wire fence, rope wire and spring wire. Annual cap., 60,000 tons ingots, 60,000 tons wire rods, 50,000 net tons wire products, 6,000 tons rope and springs.

Works at Adrian, Mich.: Product: wrought iron fence, ornamental iron work, windshields for automobiles, etc.

PANAMA CANAL (The), Balboa Heights, Canal Zone, Panama.

Works at Balboa, in the Canal Zone: 1 2-ton Tropenas converter blt. 1911-12 at Gorgona, completed and f. o. Jan. 31, 1912, transferred to Balboa Aug. 1, 1913; 1 500-ton steam hydraulic forging press. Gray iron and brass foundry.

Product: steel castings for the exclusive use of the Panama Canal and Panama Railroad, annual cap., 400 tons.

PARDEE WORKS (The C.), Market and Herbert Sts., Perth Amboy, N. J. Org., Jan. 2; inc. Jan. 8, 1895. Capital stock: \$1,000,000; bonds \$166,000.

Ario Pardee, P.; Walter L. Foulke, T.; at 447 Drexel Bldg., Philadelphia, Pa. Charles H. Edwards, V. P. & G. M.; Charles F. Eilert, Sc.; J. L. Johnston, A.; Edgar Mullen, P. A.; at Market & Herbert Sts., Perth Amboy.

Selling agent: Philadelphia, 447 Drexel Bldg., Walter L. Foulke.

Works at Perth Amboy, N. J.: blt. 1900; f. o. Dec. 1, 1900; 3 B. O. H. fur. (2 25-ton, blt. 1903, f. o. May 19, 1904; 1 50-ton added 1907); 4 heat. fur. (3 4-d. and 1 cont.); 8 soaking pits; 5 trains (34" 2-h. 1-st. reversing blooming; 20" 3-h. 1-st. and 14" 3-h. 1-st. roughing; 12" 3-h. 5-st., 9" 3-h. 5-st. finishing). Fuel, bit. coal in rolling mill, prod. gas in O. H. fur. Machine shop for own use; 2 shafting plants. Adding 1 B. O. H. fur. (50-ton).

Product: steel ingots, blooms, billets, and merchant bars, also cold drawn flats, shafting, etc. Annual cap., 40,000 tons ingots, 30,000 tons, s. t., blooms and billets, and 25,000 tons, s. t., merchant bars.

PARKERSBURG IRON AND STEEL CO. (The), Parkersburg, W. Va.

Chartered Nov. 23, 1900. Capital stock: com. auth. \$500,000, issued \$400,000; bonds \$205,000.

C. F. Niemann, P. & T.; A. E. Niemann, V. P.; J. H. Gray, Sc.; at Pittsburgh, Pa. J. H. Randolph, A.; W. L. Danks, G. S.; E. J. Hayman, G. S. M.; at Parkersburg, W. Va.

Sales offices: New York, 139 Greenwich St., Fuller Bros. & Co. (agents); Pittsburgh, Pa., 408-9 Germania Savings Bank Bldg. Brands: "Parkersburg Blue," "Parkersburg Smooth Galvanized," and "Acme" sheet metal products.

Works at Parkersburg, W. Va.: blt. 1901, f. o. Dec., 1901; 1 billet heat. fur.; 22" 3-h. billet and sheet bar mill, with 1-st. of bull-heads; 12 pair and sheet gas heat. fur.; 26" black sheet mills, with 3 stands roughing and 6 stands finishing, (two 32", three 36", one 42"); sheets 16 to 30 gauge, not over 36" wide, 144" long; five 26" single-stand cold mills; 8 box annealing fur.; 1 plunger pickling machine, 1 hand pickling tank; 2 galvanizing pots. Sheet metal factory with presses and machinery for the manufacture of stove pipe,

stove pipe elbows, pans, and sheet metal products. Also roofing department for the manufacture of corrugated and other stamped roofings, sidings, etc. Fuel, nat. gas.

Product: finest grades of black, blue and galvanized sheet steel and special iron sheets, annual cap., 25,000 tons.

PARKESBURG IRON CO. (The), Parkesburg, Pa.

Org. April, 1873; inc. Jan. 16, 1882. Capital stock: com. auth. \$250,000, issued \$243,300; pref. auth., \$50,000, issued, \$40,000. 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, A. P. & Sc.; C. L. Frankhouser, P. A.

Selling agents:

Boston, Arthur C. Harvey Co.
Chicago, 1616 Fisher Bldg. (sales office.)
Montreal, Quebec, Watson, Jack & Co.
New Orleans, Woodward, Wight & Co., Ltd.
New York, 30 Church St. (sales office.)
Norfolk, Eagleston-Parke, Inc.
Philadelphia, 822 Commercial Trust Bldg. (sales office.)
St. Louis, Joseph G. Miller.
St. Paul, Paul J. Kalman Co.
Wheeling, M. L. Thomas.

Parkesburg Iron Works, Parkesburg, Pa.: Rolling mill: f. o. April, 1873; enl. 1887 and 1889; 2 double puddling fur.; 14 1-d. heat. fur.; two 20" 3-h. 1-st. muck mills, four 2-h. plate mills (1 23" x 60", 3 23" x 50"). Fuel, bit. coal. Machine shop for own use. Product: boiler tube skelp iron, annual cap., 22,000 tons.

Forge: 26 charcoal refinery fires; 4 ham. (1 3-ton and 1 2-ton upright and 2 helve). Product: charcoal blooms for own use, annual cap., 20,000 tons.

Tube Mill: added 1908; first charcoal iron tubes made Nov. 9, 1908; 1 bending and 3 welding fur.; 6 gas prod. Fuel, gas.

Product: charcoal iron boiler tubes, sizes from 1½" to 6" inclusive; annual cap., 18,000 tons.

PARSONS CO. (The), Newton, Iowa.

Org. 1907, inc. 1908. Capital stock: \$25,000.

W. C. Bergman, P.; F. H. Bergman, V. P.; H. C. McCardell, Sc., G. M. & P. A.; O. F. Ecklund, T.; A. E. Miller, G. S.; W. N. Keiser, G. S. M.

Works at Newton, Iowa: blt. 1909, f. o. Aug. 18, 1909; 5 6-pot crucible fur. Fuel, oil. Gray iron foundry. Machine shop for jobbing and own use.

Product: trench excavating machinery, steel castings for sale up to 1,000 lbs; vanadium and other alloy steel castings; annual cap., 2,100 tons.

Passaic Steel Co., see 1908 Directory, p. 254, plant sold Nov. 26, 1909, and purchased by T. H. Conderman, representing the bondholders. Passaic Structural Steel Co. was formed and took over the property Jan. 14, 1910. Steel works and rolling mill dismantled 1912-14. Company continues the operation of the bridge works.

PECK ROLLING MILLS, LTD. (The), Mill St., Montreal, P. Q., Canada.

Thomas Peck, P.; T. E. Peck, V. P. & M. D.; E. J. Fry, Sc. & T. Works on Lachine Canal: est. 1831; heat. fur., trains of rolls, cut and wire nail machines, tack machines, horseshoe machines, railway spike and ship spike machines, etc. Fuel, bit. coal.

Product: bar iron and bar steel, concrete bars, light rails, shovel plate, railway spikes, ship spikes, cut nails, wire nails, tacks, iron and steel horseshoes, washers, etc.

Peerless Crucible Steel Casting Co., see Buchanan Electric Steel Co.

PELTON STEEL CO., Chicago Ave. and Elliott Place, Milwaukee, Wis.

Org. and inc. Mar. 1, 1916. Capital stock: \$100,000.

G. A. Reuss, P. & T.; Wm. H. Schuchardt, V. P. & Sc.; T. H. Harvey, A. Sc.; E. T. Pelton, G. M.

Works at Chicago Ave. and Elliott Place, Milwaukee: blt. 1906; nine 8-pot crucible fur.; first crucible steel made Oct. 1, 1906; adding one Snyder electric fur. (3,000-lb.). (Formerly owned by Prime Steel Co.; acquired by present owners Mar. 1, 1916).

Product: steel castings for sale; annual cap., 2,100 tons crucible, and 1,800 tons electric steel castings.

Peninsular Steel Castings Co. built a crucible steel casting plant at Iron and Wight Sts., Detroit, Mich., in 1912. Property sold Jan. 7, 1915, by Security Trust Co., trustee, to Matthew Finn, and dismantled.

PENN IRON AND COAL CO. (The), 1300 Leader-News Bldg., Cleveland, Ohio.

Org. and inc. Sept. 27, 1881. Capital stock: \$1,000,000; bonds \$90,000.

D. R. Hanna, P.; M. McMurray, V. P. & G. M.; R. L. Ireland, T.; at Cleveland, Ohio. H. S. Ream, Sc.; P. R. Conlin, G. S.; at Canal Dover, Ohio.

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

Dover Furnace, Canal Dover, Ohio: 1 stack, 85' x 20', blt. 1854; last reblt. 1902-03; 3 Cowper-Roberts fire-brick stoves, 70' x 18'; 1 Foote stove, 75' x 19'; 1 McKee stove, 90' x 22'; 3 steam blowing eng. (65,000 cfm.); 12 water-tube boilers, 2,400 H. P. Coke; Lake ore. Pittsburg Coal Washer Co. casting machine. Machine shop for own use.

Product: Bessemer, basic and malleable pig iron, annual cap., 146,000 tons.

PENN IRON CO., LTD., 241 N. Plum St., Lancaster, Pa.

Limited partnership: org. 1879. Capital stock: auth. \$200,000, issued \$176,000.

A. J. Steinman, Ch.; J. F. Steinman, V. Ch. & P. A.; J. H. Steinman, Sc.; C. S. Foltz, T.

Brand: "Penn."

Penn Iron Works, Lancaster, Pa.: f. o. April, 1873; 7 double puddling fur.: 2 busheling fur., 5 heat. fur. (3 2-d., 2 3-d.); 4 trains (18" 3-h. 2-st. muck, 16" 3-h. 3-st., 10" 3-h. 6-st., 8" 3-h. 4-st. merchant); 2 ham. Fuel, bit. coal.

Product: merchant bar iron, shafting iron, screw blanks, hammered and rolled axles, car forgings, bridge work, railroad splices, fish joints, bolts, nuts, railroad, ship and wharf spikes, bolt ends, etc., annual cap., 25,000 tons of rolled products.

PENN MARINE & ORDNANCE CASTINGS CO., Inc., New Castle, Del.

Org. and inc., Jan., 1916. Capital stock: 200,000 shares common; 40,000 shares preferred; no stated par value.

Rodney Thayer, P. & G. M.; C. Ferris Jemison, Sc.; Ivers S. Adams, T.; at New Castle, Del. W. S. Bickley, V. P.; Frank Briner, G. S.; at Chester, Pa.

The company took over the Baldt Steel Co. of New Castle, Del. and the Penn Steel Castings and Machine Co. of Chester, Pa. on Feb. 1, 1916., see under those companies.

Penn Shovel Manufacturing Co., see 1908 Directory, p. 357, went into hands of receiver, March, 1908. Plant purchased from the receiver by the Warren Iron and Steel Co., May 25, 1909.

PENN STEEL CASTINGS & MACHINE CO., Front and Penn Sts., Chester, Pa.

Org. and inc. 1892. Capital stock: \$200,000. Acquired by Penn Marine & Ordnance Castings Co., Inc., Feb. 1, 1916.

Walter S. Bickley, P. & G. M.; George M. Booth, Sc. & T.

Selling agents:

Cincinnati, Hulbert Block, Moesta & Ruehrwein; New York, 30 Church St., James W. Sanders Co.; San Francisco, 110 Market St., I. E. Thayer & Co.

Works at Chester, Pa.: blt. 1892; f. o. Sept. 25, 1892; 5 A. O. H. fur. (three 30-ton, two 7-ton); 4 annealing fur. Fuel, prod. gas. Machine shop for jobbing and own use. Pattern shop and fire proof pattern storage. (2 2-ton Tropenas steel converters, added 1906-7, dismantled 1912).

Product: steel castings; locomotive and general railway, and marine castings; high pressure pipes and fittings, gears, rolls, gun mounts and carriages, anchors, cylinders, and miscellaneous castings from 1 to 100,000 lbs., for sale, annual cap., 20,000 tons.

PENNSYLVANIA BRAKE BEAM CO., lessee, 943 E. Market St., Danville, Pa.

Org. and inc. May 11, 1904. Capital stock: \$20,000.

James W. Trenchard, P.; Samuel H. Hitchner, Sc.; at Bridgeton, N. J. E. M. Applebaugh, V. P., G. M., T., G. S. M., & P. A.; at Danville, Pa.

Works at Danville: est. 1871; 1 4-d. coal heat. fur., 36' x 11'; 24" 3-h. 1-st. train. Fuel, coal. Machine shop for own use. (Owned by T. J. Price, trustee).

Product: special shapes for brake beams, deck and I beams and channels, annual cap., 15,000 tons.

Pennsylvania Malleable Co., see 1908 Directory, p. 298; works at McKees Rocks, Pa., leased to Pressed Steel Car Co., July 1, 1909.

PENNSYLVANIA STEEL CO. (of New Jersey), 1800 Morris Bldg., Philadelphia, Pa.

Org. and inc. April 29, 1901. Capital stock: com. auth. \$25,000,000, issued \$10,750,000; pref. 7% auth. \$25,000,000, issued \$20,560,800. Controlling interest acquired by Bethlehem Steel Corporation in Feb., 1916.

W. H. Donner, Ch.; E. C. Felton, P.; Frank Tenney, Sc.; E. T. Stuart, T.; Frank S. Reitzel, C.; at Philadelphia, Pa. F. W. Wood, V. P.; at Sparrow's Point, Md.

The company owns practically all the capital stock of The Pennsylvania Steel Co. of Pennsylvania, with works at Steelton, Harrisburg, and Lebanon, Pa., and the entire capital stock of the Maryland Steel Co., with works at Sparrow's Point, Md.

It also owns all the stock of the Spanish-American Iron Co., which operates extensive iron ore mines in Cuba; the Daiquiri mines at Daiquiri, with an annual cap. of 500,000 tons and the Mayari mines, near Felton, with an annual cap. of 1,000,000 tons.

It also owns the entire stock of the Penn-Mary Coal Co., org. and inc. Jan. 16, 1906, which owns about 16,000 acres of coal lands at Heilwood, Indiana County, Pa. Annual cap. of the mines, 850,000 tons.

It also owns a majority of the stock of the Possum Glory Coal and Coke Co., which operates coal mines in Indiana County, Pa.

PENNSYLVANIA STEEL CO. (The) of Pennsylvania, 1800 Morris Bldg., Philadelphia, Pa.

Org. and inc. July 12, 1895. Capital stock: com. \$5,000,000; pref. \$1,500,000.

E. C. Felton, P.; Frank Tenney, Sc.; E. T. Stuart, T.; Frank S. Reitzel, C.; R. W. Gillispie, G. M. S.; W. B. Enck, P. A.; at Philadelphia, Pa. Quincy Bent, G. W. M.; F. D. Carney, G. S.; at Steelton, Pa. B. D. Coleman, Resident Director; at Lebanon, Pa.

Selling agents:

Baltimore, Continental Bldg., J. A. Davis.
 Boston, 70 Kilby St., C. S. Clark.
 Chicago, McCormick Bldg., Stanley Smith.
 London, E. C., England, 110 Cannon St., Watson & Co.
 New York, 71 Broadway, R. E. Belknap.
 Philadelphia, Morris Bldg., N. E. Salsich.
 Philadelphia, Morris Bldg., Robert Gross, (pig iron.)
 St. Louis, Commonwealth Trust Bldg., J. G. Miller.
 San Francisco, Cal., Chronicle Bldg., H. B. Green.
 Steelton, Forge Dept., H. L. Rittenhouse.
 Steelton, Frog and Switch Dept., R. L. Gillespie.
 Steelton, R. W. Read.

Product: Bessemer, low-phosphorus and basic pig iron, spiegeleisen; ingots, blooms, slabs, forging ingots, forging blooms, forging billets; standard rails, high tee, girder and guard rails, light rails; I beams, channels, angles, and other structural shapes; merchant bars, rounds, flats, splice bars, tie plates, spring steel, seamless tube round billets, small billets, etc.; build and erect railway and highway bridges, steel frame buildings and other heavy and light structural work; frogs, switches and crossings for steam and street railways; miscellaneous steel forgings, heavy eye-bars for bridges; Mayari heat-treated track bolts, machine bolts, and structural rivets; high speed crucible tool steel; steel castings, 5 to 60,000 lb. for general machinery purposes, steel rolls, and pinions for rolling mills; "Manard" steel castings for frogs, switches, and crossings; wearing parts of mining machinery, dredges, steam shovels, stove crushers, etc.

Lebanon Furnaces, Lebanon, Pa.: 2 stacks; No. 1, 80' x 18', blt. 1845, last rebt. 1885; No. 3, 100' x 20', blt. 1872-73, f. o. Aug., 1873, rebt. 1898; 4 Massicks & Crooke, 1 Roberts and 3 Cowper stoves; 6 steam blowing eng. (93,700 cfm.); 20 water-tube boilers, 5,000 H. P.; 4 nodulizing fur. for fine ore concentrates, annual cap., 150,000 tons; to be enlarged in 1916 to an annual cap. of 330,000 tons. 1 double-strand Uehling casting machine. By-product coke; Cornwall ore. Machine shop for own use. Product: Bessemer and low-phosphorus pig iron, annual cap., 190,000 tons.

Lochiel Furnace, Harrisburg, Pa.: 1 stack, 65' x 13½', blt. 1872; f. o. April, 1873; remod. 1886; 2 Whitwell stoves; 2 steam blowing eng. (18,500 cfm.); 4 water-tube boilers, 1,000 H. P.; 1 slag gran. pit, annual cap., 35,000 tons. Anthracite coal and coke; foreign and domestic ore. Product: Bessemer and low-phosphorus pig iron and spiegeleisen. Annual cap., 40,000 tons of spiegeleisen or 55,000 tons of pig iron. *Last active in 1913.*

Steelton Works, Steelton, Pa.: Steelton Furnaces, 5 stacks: No. 1, 60' x 16', blt. 1872-73, f. o. Oct., 1873, remod. 1883, 2 Whitwell, 1 P. S. Co. stoves; No. 2, 80' x 18', blt. 1874-76, f. o. June, 1876,

remod. 1877, 2 Whitwell, 2 Kennedy, 1 P. S. Co. stoves; No. 3, 85' x 18', blt. 1883-4, f. o. Feb., 1884, 3 Whitwell, 2 Kennedy, 1 P. S. Co. stoves; No. 4, 80' x 18½', blt. 1883-84, f. o. April, 1884, rebt. 1908, 3 Whitwell, 2 Kennedy, 1 P. S. Co. stoves; No. 5, 85' x 21½', blt. 1914-15, f. o. Sept. 21, 1915; 4 hot blast stoves; 8 blowing eng. (6 steam, 2 gas) 177,200 cfm., 40 water-tube boilers, 13,750 H. P.; 2 pig iron casting machines. Present sintering plant, annual cap., 30,000 tons, to be relocated in 1916 and increased to two Greenawalt pans, annual cap., 60,000 tons. Coke, by-product coke and mixed anthracite and coke; foreign and domestic ore. Molten metal to mixers and open hearth fur. Product: Bessemer, low-phosphorus and basic pig iron and spiegeleisen, annual cap., 610,000 tons.

Bessemer Dept.: blt. 1913; 2 20-ton converters; 2 metal mixers (400 and 800-ton), molten metal from Steelton Furnaces. (This plant replaces one blt. 1865-67, f. o. May 25, 1867, rebt. 1881, dismantled 1913.) Product: Bessemer steel ingots and blown metal for duplexing, annual cap., 800,000 tons.

Open Hearth Dept.: blt. 1907, rebt. 1913; 8 B. O. H. fur. (2 200-ton tilting; 6 90-ton stationary); 2 25-ton A. O. H. fur. (blt. 1900-01; enl. 1903; first O. H. castings made Aug. 24, 1901) used for steel castings. Molten metal from Steelton Furnaces. Product: ingots and castings. Annual cap., 715,000 tons ingots, and 20,000 tons castings for sale and for own use.

Crucible Steel Dept.: blt. 1903-05; first steel made Sept. 28, 1903; 17 4-pot crucible fur. Product: high-speed tool steel, annual cap., 3,750 tons.

Rail Mill: orig. blt. 1867-68; 6 soaking pits; 34" 3-h. 1-st. blooming mill; 26" 3-h. 3-st. rail mill; first steel rails rolled May 15, 1868; 5 14-d. horizontal heat. fur. Product: standard sections of rails, street rails, etc., annual cap., 300,000 tons.

Blooming Mill, No. 2: blt. 1885-86, f. o. 1886; 30¾" 2-h. 1-st. reversing mill; 6 1-hole soaking pits; 1 2-h. 1-st. slabbing mill with 26½" horizontal and 20½" vertical rolls, blt. 1893; 8 1-hole soaking pits; can roll slabs 48" wide and 32" thick. Product: blooms and slabs for structural purposes; forging blooms, forging billets, nail slabs, and high carbon special steel billets. Annual cap., 200,000 tons of slabs, 240,000 tons blooms and billets.

New Rail and Structural Mill: blt. 1915; f. o. May, 1915; 44" 2-h. 1-st. blooming mill; 4 4-hole soaking pits; 35" 2-h. 1-st. roughing; 3 8-d. regenerative horizontal heat. fur.; 28" 3-h. 2-st. intermediate, 28" 2-h. 1-st. finishing. Product: light and heavy standard tee rails, high tee, girder and guard rails, I beams, channels, angles and other structural shapes and flats, annual cap., 400,000 tons.

Merchant Mill No. 2 (formerly Billet mill): blt. 1887, rebt. 1913-14; 20" 3-h. 3-st. train; 2 coal-fired mechanical stoker cont. fur. Mill blt. 1883, 2 trains (13" 3-h. 5-st. and 20" 3-h. 4-st.); 10 coal-fired

heat. fur. (7 2-d., 3 3-d.). Machine, repair and other auxiliary departments. Product: bars, angles, I beams, channels, shapes, splice bars, tie plates, spring steel, flats, rounds, light rails, seamless tube round billets, small billets, etc., annual cap., 170,000 tons. Will add in 1916, 14" 2-h. 6-st. and 16" 3-h. 2-st. merchant mills. Forge Department: 1 2,000-ton, 1 800-ton steam hydraulic press; 1½-ton ham; also equipped with upsetting and finishing machine for the manufacture of eye-bars up to largest size required for heavy bridge work. Product: miscellaneous steel forgings from medium to heavy weight, annual cap., 20,000 tons.; eye-bars, annual cap., 8,000 tons.

Bridge and Construction Dept.: Product: railroad, highway and various types of rolling, lift and swing bridges; also erects iron and steel buildings and other light and heavy structural work, annual cap., 100,000 tons.

Frog and Switch Departments: Product: frogs, switches and crossings of all kinds for steam and street railway requirements.

Bolt and Rivet Dept.: Product: "Mayari" steel heat-treated track bolts; machine bolts and rivets are also made for own use; annual cap., 24,000 kegs.

The company also operates 2 iron foundries, castings for own use only.

The Pennsylvania Steel Company owns a majority interest in the Cornwall Ore Banks, at Cornwall, Pa., with an annual cap. of 1,000,000 tons.

The company owns and operates an extensive limestone quarry of 148 acres at Steelton adjoining its property at that place. The limestone quarried is all consumed by the Steelton Furnaces, annual cap., 200,000 tons.

It also owns 90 Semet-Solvay by-product coke ovens at Lebanon, Pa., annual cap., 300,000 net tons. At Steelton the company has 120 Semet-Solvay by-product coke ovens, with an annual cap. of 400,000 net tons of coke.

Pennsylvania Swedish Iron Co., see 1908 Directory, p. 291, charcoal forge at Cheswick, Pa., blt. 1905-06, closed down in 1907, sold and dismantled in 1910.

Pequest Co., see 1908 Directory, p. 250. Pequest Furnace at Buttzville, N. J., abandoned in 1911.

PERRY IRON CO., Western Reserve Bldg., Cleveland, Ohio.

Inc. July 12, 1906, org. July 12, 1914. Capital stock: com. auth. \$400,000, issued \$340,000; bonds \$475,000.

H. G. Dalton, P.; G. H. Beaumont, V. P. & G. M.; S. E. Bool, Sc. & A.; E. P. Williams, T.; H. S. Pickands, P. A.; at Cleveland, Ohio. C. F. Kaufholz, G. S.; at Erie, Pa.

Brand: "Perry."

Selling agents: Cleveland, Ohio, Pickands, Mather & Co.

Perry Furnace, Erie, Pa.: 1 stack, 75' x 18'; construction commenced July 25, 1906; completed and f. o. June 16, 1907; 3 McClure stoves, 70' x 21', 1 McKee stove, 70' x 22'; 2 steam blowing eng. (40,000 cfm.); 6 Rust water-tube boilers, 3,000 H. P. Coke; Lake ore. Machine shop for own use. Uehling single-strand pig iron casting machine.

Product: foundry, malleable and Bessemer pig iron, annual cap., 109,500 tons.

PETTIBONE MULLIKEN CO., 725 Marquette Bldg., Chicago, Ill.

Inc. June 21, 1912. Capital stock: com. \$7,000,000; pref. 7% cum. auth. \$3,000,000, issued \$2,875,000.

A. H. Mulliken, P.; A. A. Strom, 1 V. P., Sc. & T.; W. C. Winter, 2 V. P.

Works at 48th Ave. & Division St., Chicago: blt. 1908, f. o. Feb., 1909; 2 4-ton Schwartz steel fur. Fuel, crude oil.

Product: steel castings for sale and for own use; railroad appliances; manganese steel frogs, crossings, switches, switch stands, guard rails, etc.; annual cap., 1,200 tons castings.

Philadelphia Forge Co., corporate title changed to Philadelphia Steel and Forge Co., Mar. 15, 1909.

Philadelphia Iron and Tin Plate Works, at Beach and East Berks Sts., Philadelphia, Pa., rolling mill blt. 1858; tinning plant added 1893; idle since 1894; see 1908 Directory, pp. 257 and 471. Formerly owned by Hughes & Patterson, Inc.; plant dismantled and sold for other purposes.

PHILADELPHIA STEEL AND FORGE CO., 50 Church St., New York.

Org. and inc. Nov. 3, 1899. Capital stock: com. auth. \$200,000. Formerly known as Philadelphia Forge Co., corporate title changed to Philadelphia Steel and Forge Co., Mar. 15, 1909.

D. G. Gautier, P.; W. C. Pearson, V. P.; J. B. Warren, Sc. & G. S. M.; W. H. Brudi, T.; at New York. F. Luning, G. S. & P. A.; at Tacony, Philadelphia, Pa.

Selling agent: New York, 50 Church St., D. G. Gautier & Co.

Works at Tacony, Philadelphia, Pa.: orig. blt. 1898; rolling mill added 1907; first products forged, May 26, 1898; first products rolled, Dec., 1907; 7 heat. fur. (3 2-d. billet, 4 4-d. bar); 4 annealing fur.; 3 trains (two 12" 3-h. 3-st., one 10" 3-h. 7-st. merchant); 4 ham. (1,600 to 14,000-lb.) Fuel, bit. coal. Machine shop for jobbing and own use.

Product: rolled steel rounds, squares, flat bars, and specialties in shapes and carbon and alloy steels; also forged bars, die blocks, shafts, crank shafts, axles, etc. Annual cap., 60,000 tons rolled, 8,000 tons forged products.

Phillemac Rolling Mill Co., Glendale, Ohio, see 1910 Supplement, p. 26; rolling mill at Woodlawn, Hamilton County, Ohio, blt. 1908; plant sold at receiver's sale in June, 1912 and dismantled.

PHILLIPS SHEET AND TIN PLATE CO., Weirton, W. Va.

Org. 1905, inc. April 27, 1905. Capital stock: com. auth. \$5,500,000, issued \$5,410,000; bonds \$648,000.

E. T. Weir, P.; at Pittsburgh, Pa. D. M. Weir, V. P. & Sc.; F. S. Loeb, T.; E. M. Mentzer, M.; at Steubenville, Ohio. W. H. Baldridge, V. P.; at New York. J. C. Williams, A. P. & G. M.; C. V. Erdmann, M.; at Weirton, W. Va. O. H. Burgham, M.; at Clarksburg, W. Va. E. L. Cronmeyer, Special Agent.

Sales offices:

Boston, Chicago, Los Angeles, Omaha, Philadelphia, Portland, Ore., San Francisco, Seattle, St. Louis, Tacoma, and Vancouver, B. C.

Product: black plates for tinning; tin and terne plates; cold rolled strip steel.

Clarksburg Plant, Clarksburg, W. Va.: blt. 1901-02; f. o. June, 1902; 12 pair and 12 sheet fur.; 9 annealing fur.; 12 28" hot black plate mills, 12 24" cold mills, 6 stands in tandem of 2; 3 Mesta 3-arm pickling machines; 5 box annealing fur. Fuel, nat. gas. Tinhouse: 27 sets for coke tinplates. **Product:** black plates for tinning, annual cap., 45,000 tons; coke tinplates, annual cap., 1,100,000 base boxes.

Steubenville Plant, Steubenville, Ohio: blt. 1901-02; f. o. July, 1902; 12 pair and 12 sheet fur.; 12 28" hot black plate mills; 12 22" cold mills, 6 stands in tandem of 2; 2 Mesta 3-arm pickling machines; 5 box annealing fur. Fuel, coal and nat. gas. Tinhouse: 20 sets for coke tinplates. (Formerly owned and operated by the Pope Tin Plate Co., acquired by Phillips Sheet and Tin Plate Co., Jan. 1, 1912). **Product:** black plates for tinning, annual cap., 40,000 tons; coke tinplates, annual cap., 1,000,000 base boxes.

Weirton Plant, Weirton, W. Va.: blt. 1909; f. o. Jan., 1910; 20 pair and 20 sheet fur.; 24 28" hot black plate mills; 13 24" cold mills (6 sets in tandem of 2, 1 single stand); 4 Mesta 3- and 4-arm pickling machines; 8 box annealing fur. Fuel, coal and nat. gas. Tinhouse; 50 sets, 42 for coke and 2 for charcoal tinplates, 6 for terne plates. **Product:** black plates for tinning; also small sheets, annual cap., 75,000 tons; tinplates and terne plates, annual cap., 2,000,000 base boxes.

Cold Rolled Strip Steel Dept.: Plant of Weirton Steel Co., Weirton, W. Va., acquired Feb. 1, 1915; product, 30,000 tons cold rolled strip steel; adding one 2-high semi-continuous hoop and band mill, with 20" 6-st. and 16" 5-st. trains; annual cap., from 100,000 to 120,000 tons of hoops and bands from 1" to 16½" wide.

PHOENIX HORSE SHOE CO., Rookery Bldg., Chicago, Ill.

J. W. Kiser, P.; Samuel H. Roberts, Sc. & T.; at Rookery Bldg., Chicago, Ill. Thomas F. Hotchkiss, V. P., G. S. & P. A.; at Joliet, Ill.

Brands: "Phoenix," "Bull Dog."

Product: horseshoe bars; horse and mule shoes and toe calks.

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; 2 gas regenerative and 23 coal heat. fur.; 6 trains (four 9", 10", 20"). Fuel, coal and prod. gas. Product and annual cap., 24,000 tons bars.

Poughkeepsie Works, Poughkeepsie, N. Y.: blt. 1873; 1 single puddling fur., 2 gas and 22 coal heat. fur.; 6 trains (four 9", two 18"). Fuel, coal and prod. gas. Product and annual cap., 20,000 tons bars.

PHOENIX IRON CO. (The), 410 Walnut St., Philadelphia, Pa.

Org. and inc. April 27, 1855. Capital stock: com. \$700,000; pref., 7% cum., \$800,000; bonds, \$1,200,000.

David Reeves, P.; George Gerry White, Sc.; George C. Carson, Jr., T.; A. H. Cordery, G. S. M.; Samuel J. Reeves, P. A.; at 410 Walnut St., Philadelphia. William H. Reeves, V. P. & G. S.; Frank P. Norris, M.; at Phoenixville, Pa.

Sales offices:

Atlanta, 901 Hurt Bldg.

Baltimore, Continental Trust Bldg.

Boston, 110 State St.

New York, 49 William St.

St. Louis, 527-28 Pierce Bldg.

Product: ingots, steel bars, beams, channels, angles, tees, miscellaneous structural shapes, eye-bars, bolts, nuts and rivets, forged steel eye-bars, steel rounds, etc.; gray iron and steel castings; erect railroad and highway bridges, iron and steel buildings.

Phoenix Iron Works, Phoenixville, Pa.

Steel Works: blt. 1888-89; enl. 1899, 1906; first steel made Feb., 1889; 6 B. O. H. fur. (one 60-ton, two 150-ton, three 200-ton); 14 Siemens and 2 Duff gas prod.; 4 4-hole soaking pits; 36" 2-h. 1-st. reversing blooming mill. Product and annual cap.; 226,000 tons of ingots. Rolling mill: original works blt. 1790; enl. 1809; new mill blt. 1873; 9 Siemens heat. fur.; 1 Laughlin cont. heat. fur.; 1 Siemens and 19 Phoenix gas prod.; 5 trains (9'3-h. 4-st., 13'3-h. 4-st., two 22'3-h. 4-st., 24'3-h. 4-st.) Fuel, bit. coal and prod. gas. Product: steel bars, beams, channels, angles, tees, miscellaneous structural shapes, annual cap., 200,000 tons.

Bridge Works: Product: railroad and highway bridges; iron and

steel buildings; annual cap., 75,000 tons. An eye-bar plant, making bars from 3" to 16" inclusive in width; also a hydraulic testing machine with a cap. of 2,800,000 lbs. Product: forged steel eye-bars, forged steel rounds, etc., annual cap., 8,000 tons. Foundry: Product: all kinds of heavy gray iron and open hearth steel castings. Annual cap., 6,000 tons of iron and 2,500 tons of steel castings.

Bolt, Nut and Rivet Works: Product: bolts, nuts and rivets, for own use only; sizes from $\frac{1}{2}$ " to $1\frac{1}{2}$ " inclusive.

The company owns 1,330 acres of iron ore lands in Chester, Montgomery, Berks, and Lancaster counties, Pennsylvania. It also owns 15 acres of limestone lands at Port Kennedy, Pennsylvania.

PINE IRON WORKS CO., Pine Forge, Pa. (Telegraph address, Pottstown, Pa.)

Org. and inc. 1902. Capital stock: \$75,000.

James B. Bailey, P.; J. Albert Whitacre, G. S.; at Pine Forge, Pa. James P. Rogers, Sec. & T.; at Warren, Pa.

Brand: "Pine".

Pine Iron Works, Pine Forge, Pa.: blt. 1881; 1 3-d. heat. fur.; 26" x 84" 2-h. and 26" x 72" 3-h. plate mills; 1 100" Morgan shear. Fuel, bit. coal.

Product: iron and steel, boiler, ship, tank and floor plates, annual cap., 10,000 tons.

PIONEER IRON CO., Negaunee, Mich.

Org. and inc. April, 1857. Capital stock: \$125,000.

William G. Mather, P.; R. C. Mann, V. P.; S. L. Mather, Sec. & T.; at Cleveland, Ohio.

Selling agents: Cleveland, Ohio, Cleveland-Cliffs Iron Co. for chemicals; Grand Rapids, Mich., Superior Charcoal Iron Co. for pig iron.

Brand: "Marquette."

Pioneer Furnace, No. 2, Marquette, Mich.: 1 stack, 70' x 12', blt. 1901-03, f. o. April 16, 1903; 3 hot blast stoves; 2 steam blowing eng. (12,000 cfm.); 9 water-tube boilers, 2,970 H. P. Charcoal; Lake ore. Gayley dry-air plant. Machine shop for own use.

Product: charcoal car wheel, foundry, malleable, and low-phosphorus pig iron, annual cap., 42,000 tons.

Carp Furnace, Marquette, Mich.: 1 stack, dismantled in 1914.

At Marquette the company operates a plant for the manufacture of charcoal, with recovery of by-products. The plant is equipped with 6 90-cord and 80 80-cord kilns and has an annual cap. of 3,500,000 bushels of charcoal; 350,000 gallons of wood alcohol; 5,000,000 lbs. of acetate of lime; 2,500,000 lbs. of acetone; 2,400,000 lbs. of acetic acid; 10,800 tons of sulphuric acid; and 3,500,000 lbs. of formaldehyde.

Pioneer Iron and Steel Co., Tulsa, Okla., blt. rolling mill at Sand Springs, Okla. Leased and operated for few months in 1913-14 by Iron and Steel Products Co. (of Okla.) Taken over in satisfaction of mortgage by Charles Page, Tulsa, Okla., and sold to the Osage Iron & Steel Co., Jan. 1, 1916.

Pioneer Steel Co., see 1908 Directory, p. 387, closed down late in 1909. Works dismantled in 1912. Plant sold and used for other purposes.

Pittsburgh Axle Co., see 1908 Directory, p. 305. Plant for rolling axles at Morado, near Beaver Falls, Pa., idle for several years, was dismantled in 1911.

PITTSBURGH CRUCIBLE STEEL CO., Oliver Bldg., Pittsburgh, Pa. Org. and inc. Feb. 20, 1911. Capital stock: \$5,000; bonds \$7,500,000. Entire capital stock owned, and bonds guaranteed by Crucible Steel Co. of America.

J. W. Dougherty, P.; C. C. Ramsey, V. P.; G. A. Turville, Sc. & T.; H. H. Stewart, A; N. W. Nolen, C.; T. Burns, G. S.; Bryan Robertson, G. S. M.; J. W. Todd, P. A.

Midland Works at Midland, Beaver Co., Pa. Midland Furnace: 1 stack, 85' x 21', blt. 1905-06, f. o. Sept. 6, 1906, rebt. 1914; 5 McClure 3-pass stoves, 100' x 21'; 4 steam blowing eng. (50,000 cfm.); 14 boilers (4 water-tube, 10 tubular) 5,932 H. P.; 1 Uehling double-strand casting machine; 1 slag granulating pit, annual cap., 100,000 tons. Small gray iron foundry, direct castings for own use. Coke; Lake ore. (Formerly owned by Midland Steel Co.; acquired by present owners, Mar. 1, 1911.) Product: basic pig iron, annual cap., 180,000 tons.

Bee-hive Coke Plant at Midland, Pa., consisting of 240 bee-hive coke ovens, annual cap., 150,000 net tons. Not operated at present time.

Steel Works: blt. 1911-12, first steel made Aug. 4, first rolled products Aug. 5, 1913, metal mixer (600-ton); 6 B. O. H. fur. (90-ton); 4 A. O. H. fur. (90-ton); 7 4-hole soaking pits (214 ingots); 1 cont. heat. fur.; 3 trains (40" 2-h. reversing blooming; Morgan continuous with 6-st. 14" and 12" to 8" finishing stands and 2 Morgan cont. heating fur.; 24" 2-h. 3-st. bar with 2 reheating fur.); adding 28" 3-h. 1-st. billet mill. Fuel, natural and producer gas.

Product: ingots, merchant bars, nickel, chrome and chrome-vanadium alloy steel ingots and bars. Annual cap., 500,000 tons ingots, (300,000 tons basic, 200,000 tons acid); 400,000 tons rolled products.

The company owns 445 acres of limestone lands at Walford, Lawrence Co., Pa., and operates a quarry, annual cap., 180,000 tons.

PITTSBURGH FORGE AND IRON CO., 10th St. and Penn Ave., Pittsburgh, Pa.

Org. 1863; inc. 1867. Capital stock: \$200,000. F. E. Richardson, P. & T.; W. I. Miller, Sc.; John H. Barr, M.

Selling agents: Chicago, R. A. Dugan; New York, L. A. Shepard. Brands: "Atlas" and "Atlas Special" for rolled products.

Works in the 9th Ward, Pittsburgh, Pa.: blt. 1864; 38 single puddling fur.; 15 regenerative heat. fur. (1 1-d., 6 2-d., 6 3-d., 2 4-d.); 2 annealing fur.; 5 trains (two 20" 3-h. 2-st. muck, 16" 3-h. 3-st. bar, 16" vertical, 9" 3-h. 5-st. guide); 11 steam ham. (800-lb. to 7-ton). Fuel, mfd. and nat. gas and coal. Machine shop for own use.

Product: bar iron and steel, splice bars, track bolts, machine bolts, arch bars, links and pins, engine and staybolt iron, hammered steel car and locomotive axles, and marine and locomotive forgings. Annual cap., 36,000 tons finished rolled products, 24,000 tons forged products.

PITTSBURGH IRON AND STEEL FOUNDRIES CO., Midland, Pa.

Est. 1837; inc. Oct. 23, 1899. Capital stock: \$600,000.

J. Ramsey Speer, P.; Weaver H. Rogers, V. P. & G. M.; Charles McKnight, T.; at Pittsburgh, Pa. Clyde Brooks, Sc. & P. A.; Floyd Clifton, G. S.; at Midland, Pa.

Works at Midland, Pa.: blt. 1907; 2 A. O. H. fur. (20 and 25-ton); first steel made June 27, 1912; 3 iron and special cupolas. Fuel, nat. gas. (Formerly operated by the S. Jarvis Adams Co., name changed to the Pittsburgh Iron and Steel Foundries Co., Aug. 12, 1912.)

Product: "Adamite" rolls, iron and steel castings and ingot molds for sale; annual cap., 41,000 tons steel castings and 70,000 tons iron castings.

PITTSBURGH SEAMLESS TUBE CO., Beaver Falls, Pa.

Org. July 23, 1901; inc. Aug. 15, 1901. Capital stock: com. auth. \$500,000, issued \$425,000.

G. H. Blaxter, P.; E. E. McPherson, Sc.; F. J. Cluley, T.

Works at Morado Station on the Pittsburgh, Fort Wayne, and Chicago Ry.: blt. 1899; f. o. Dec. 20, 1899; 2 heat. fur. (1 2-d., 1 3-d.); 1 piercing mill; 2 trains (22" 2-h. 1-st., 14" 2-h. 1-st).

Product: steel blanks for seamless drawn tubes. Annual cap., 25,000 tons of blanks and 2,000,000 feet of tubes.

Pittsburgh Sheet and Tin Plate Co., Pittsburgh, Pa., see Commonwealth Title Insurance and Trust Co., may acquire plant at Marietta, Ohio.

Pittsburgh Spring and Steel Co., see 1908 Directory p. 302, project, for adding hot rolls abandoned.

PITTSBURGH STEAMSHIP CO.; General offices, Rockefeller Bldg., Cleveland, Ohio, and Wolvin Bldg., Duluth, Minn.

A subsidiary of the United States Steel Corporation.

H. Coulby, P. & G. M.; A. F. Harvey, V. P.; E. C. Collins, V. P.; James H. Hoyt, Sc.; at Cleveland. J. H. McLean, V. P.; George D. Swift, A. T.; John L. Mullin, A.; at Duluth. Charles E. Scheide, T.; at 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, 71 steamships and 21 barges.

PITTSBURGH STEEL CO., Frick Bldg., Pittsburgh, Pa.

Org. and inc. July 1, 1901. Capital stock: com. \$7,000,000; pref. 7% cum. \$10,500,000.

Wallace H. Rowe, P.; John Bindley, V. P.; D. P. Bennett, V. P. & T.; C. E. Beeson, Sc.; E. Steytler, F. H. Forman, M. E. Johnson, M. S.; C. J. Mogan, G. S.; Robert McMillan, P. A.

Sales offices:

Chicago, McCormick Bldg.	Memphis, Exchange Bldg.
Dallas, Southwestern Life Bldg.	New York, Singer Bldg.
Duluth, First National Bank Bldg.	Pittsburgh, Frick Bldg.

Product: pig iron, billets, rounds for seamless tubes, hoops, bands and cotton ties, bright, annealed and galvanized wire, barbed wire, wire fence, wire nails and staples.

The company owns and operates plants at Monessen and Glassport, Pa. It controls the following subsidiary companies:

Pittsburgh Perfect Fence Company, Ltd.

Pittsburgh Steel Ore Company, which owns the Rowe Mine on the Cuyuna Range.

Pittsburgh Steel Sales Company.

Standard Land & Improvement Company.

Monessen Coal & Coke Company.

Monessen Southwestern Railway Company.

Monessen Works, Monessen, Pa. Monessen Furnaces: 2 stacks, blt. 1912-13, blown in Aug. 5 and Aug. 28, 1913, 90' x 22' 6"; 8 McClure 3-pass stoves, 100' x 22'; 4 cross-compound steam blowing eng.; 17 boilers, 8,500 H. P.; five 15,000,000 gal. pumping eng.; 1 pig casting machine; 2 Greenawalt iron ore sintering pans, annual cap., 24,000 tons. Coke; Lake ore. Product: basic pig iron, annual cap., 360,000 tons.

Open Hearth Dept.: 8 B. O. H. fur. (60-ton); metal mixer (600-ton) blt. 1908, first steel made Aug. 3, 1908. Annual cap., 400,000 tons of ingots. Adding two 60-ton B. O. H. fur.; will probably be completed by June 1, 1916.

Rolling Mill Dept.: orig. blt. 1901-02; 6 trains (46" 3-h. 1-st. blooming mill; two 28" billet mills; 18" Morgan cont. bar mill; Garrett & Cromwell continuous rod mill; Morgan cont. rod mill.) Annual cap., 300,000 tons wire rods, etc.

Wire Drawing Dept.: annual cap., 400,000 tons; galvanizing dept., annual cap., 120,000 tons; barbed wire and fence mach., annual cap., 120,000 tons; wire nail machines, annual cap., 2,400,000 kegs. Glassport Works, Glassport, Pa.: blt. 1899-00, 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 and annual cap.: 36,000 tons hoops, bands and cotton ties.

PITTSBURGH STEEL FOUNDRY CO., 1208 House Bldg., Pittsburgh, Pa.

Org. and inc. 1899. Capital stock: com. auth. \$1,000,000, issued \$965,400.

Stewart Johnston, P.; John M. Lockhart, V. P.; O. S. Pulliam, Sc. & G. M.; John Bright, T.; G. A. Hassel, G. S.; E. R. Williams, G. S. M.

Sales offices: Chicago, 1502 Fisher Bldg., James E. Simons; Philadelphia, 927 Real Estate Trust Bldg., H. V. Seth.

Works at Glassport, Pa.: blt. 1899; first steel made Nov., 1899; 2 20-ton B. O. H. fur.; 3 20-ton A. O. H. fur. Fuel, nat. gas. Machine shop for jobbing and own use.

Product: steel castings for sale, annual cap., 24,000 tons (16,000 tons basic, 8,000 tons acid).

PITTSBURGH STEEL PRODUCTS CO., Frick Bldg., Pittsburgh, Pa.

Org. and inc. 1909.

Willis F. McCook, P.; Edward H. Bindley, V. P.; W. C. Reitz, Sc. & T.; Wm. L. Rowe, A. Sc. & A. T.

Works at Monessen: built in 1904-05 and first put in operation in 1905; 3 billet heating fur., 2 hydraulic billet breakers, 3 Mannesmann billet piercing mills, two 20" mills for drawing hot pierced billets into tubes and supplementary machinery for finishing tubes. Fuel, nat. gas. Machine shop for own use. (Formerly owned and operated by the Seamless Tube Company of America; acquired by Pittsburgh Steel Products Company in 1909.)

Product: tubes of all gauges and forms, from 1 inch to about 6 inches; annual capacity, 60,000 tons.

Pope Tin Plate Co.; acquired by the Phillips Sheet and Tin Plate Co., Jan. 1, 1912.

Portland Bronze and Crucible Steel Foundry, Portland, Oregon, see 1912 Supplement, p. 54, acquired by Electric Steel Foundry, Sept. 1, 1913.

Portland Iron and Steel Co., see 1908 Directory, p. 231, works at Portland, Me., leased to Bancroft and Martin Rolling Mills Co., June 1, 1912.

PORTLAND ROLLING MILLS, LTD. (The), St. John, New Brunswick, Canada.

Inc. Mar. 22, 1899. Capital stock: pref. \$90,000.

R. G. Wallace, P.; Walter L. Smith, Sc., T., G. M., & G. S.
Brand: "Monarch."

Works at St. John: blt. 1856; rolling mill added 1860, burned and rebt. 1889; 1 single puddling fur.; 6 3-d. heat. fur.; 3 trains (18" 2-h. 1-st., 12" 3-h. 1-st., 9" 3-h. 1-st. bar); 1 5-ton helve ham.; 3 spike machines; also complete set of horseshoe machinery. Machine shop for own use. Fuel, coal. (Manufacture of cut nails abandoned, 38 cut nail machines, 18 tack and shoe nail machines still in works.) Three galvanizing pots.

Product: bar iron, car axles, street and mine rails, fish plates, ship and railway spikes, knees for ships, shafting, horseshoes, bolts, nuts, etc. Annual cap., s. t., 10,000 tons finished rolled products, 2,300 tons of ship and railway spikes, 14,000 kegs horseshoes, 900 kegs of bolts and nuts.

PORT MOODY STEEL WORKS, LTD., 701 Standard Bank Bldg., Vancouver, B. C., Canada. Capital stock: \$150,000.

Edmond Francis, P.; P. H. Mynahan, G. M.; A. T. Jones, Sc.

Works at Port Moody, B. C.: steel plant under construction: 2 B. O. H. fur. (15-ton); rolling mill, to be completed in March, 1916; one 12" bar mill. Will make merchant bars, bands, concrete bars, angles, light rails, and other sections.

Portsmouth Steel Co., Portsmouth, Ohio, see Whitaker-Glessner Co., Portsmouth Works.

Potter, John A., see 1908 Directory, p. 407, direct process furnace abandoned.

POTTS BROTHERS IRON CO., LTD., Pottstown, Pa.

Org. and inc. Dec. 31, 1878; charter renewed in 1898 for 20 years. Capital stock: \$100,000.

George H. Potts, Ch. & G. M.; Charles R. Potts, Sc.; H. Leonard Potts, T. & G. S.

Pottsgrove Iron Works, Pottstown, Pa.: blt. 1846; 8 double puddling fur.; 4 1-d. heat. fur.; 21" 2-h. 1-st. muck mill and 17" x 50" 2-h. plate mill. Fuel, bit. coal. *For sale.*

Product: muck bar, boiler plate and tank, flue and pipe iron; specialties, pipe and flue iron. Annual cap., 10,000 tons muck bar, 12,000 tons plate iron.

Potts, William M., Wyebrooke, Pa.

Isabella Furnace Wyebrooke, Pa.: 1 stack, 60' x 7 $\frac{3}{4}$ ", blt. 1835; last rebt. 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.*

Pottstown Iron Co. owns Anvil Furnace and Pottstown Iron Works, leased to the Glasgow Iron Co., Pottstown, Pa.

Poughkeepsie Iron Co., see 1908 Directory, p. 241, 2 blast furnace stacks at Poughkeepsie, N. Y., sold as scrap July 10, 1912, and dismantled.

POWERS FOUNDRY CO. (The James F.), Elkton, Md.

George McQuilken, P.; C. B. Finley, V. P.; William Sterling Evans, Sc.; William R. Whitworth, T.; T. B. Miller, A. & G. S. M. Works at Elkton, Md.: blt. 1909, first steel made Dec. 8, 1909; 2-ton Paxson-Deemer steel converter served with 1 cupola. Fuel, coke.

Product: converter steel castings for sale, annual cap., 500 tons.

PRATT & LETCHWORTH CO., Buffalo, N. Y.

Inc. Jan. 1, 1896. Capital stock: \$2,400,000; bonds \$350,000.

John C. Bradley, P. & G. M.; Franklin D. Locke, V. P.; Willis M. Edwards, Sc. & T.; Sherman E. Townsend, A.; Alexander McNaughton, G. S.; George P. Wagner, G. S. M.; Edward W. Kerr, P. A.; J. H. Bradley, A. P.; John P. Williams, A. G. S. M.; Harry M. Lewis, A. G. S.

Buffalo Steel Foundry, Buffalo, N. Y.: orig. blt. 1861; O. H. fur. added and first O. H. steel made 1876; 3 15-ton A. O. H. fur. Fuel, oil. Machine shop for own use.

Product: steel castings for locomotive, car and electrical machinery purposes for sale, also malleable iron castings. Annual cap., 24,000 tons steel; 24,000 tons malleable castings.

Prescott Co. (The), see 1908 Directory, p. 393, have given up manufacture of steel; open hearth furnace abandoned.

PRESSED STEEL CAR CO., Farmers Bank Bldg., Pittsburgh, Pa.

Inc. Jan. 13, 1899. Capital stock: com. \$12,500,000; pref. 7% non-cum. \$12,500,000.

F. N. Hoffstott, P.; N. S. Reeder, V. P.; J. F. MacEnulty, V. P.; A. H. Larkin, Sc.; J. H. Regan, A. Sc. & A. T.; at 24 Broad St., New York. W. A. Chamberlain, A.; J. B. Rider, V. P. & G. M.; H. E. Swartz, A. T.; at Pittsburgh, Pa. B. D. Lockwood, C. E.; C. W. Wrenshall, G. S.; H. J. Gearhart, P. A.; H. E. Graham, G. F. A.; at McKees Rocks, Pa.

Selling agents:

Chicago, Ill., Old Colony Bldg., J. H. Mitchell, M. S., Western District.

New York, 24 Broad St., C. E. Postlethwaite, G. M. S.

Pittsburgh, Pa., Henry P. Hoffstott, A. M. S., Central District.

Washington, D. C., L. O. Cameron, M. S., Southern District.

Product: Pressed and structural steel and composite cars for all classes of railway traffic, tank cars, street cars, mining cars, trucks, truck frames, bolsters, centre plates, brake beams, stake pockets, stakes, gray iron car wheels, and miscellaneous appliances and specialties for railway cars and miscellaneous pressed steel specialties.

The company owns and operates two carbuilding 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-underframe and all steel 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. It 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 controls the Western Steel Car and Foundry Co. with a plant at Hegewisch, Ill., for the manufacture of freight cars and car parts. 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.: blt. 1898; f. o. 1899; 1 Swindell & Smythe A. O. H. fur. (15-ton); first O. H. steel made Nov. 3, 1903. Fuel, nat. gas. Malleable iron foundry with 30 annealing fur. (Formerly operated by Pennsylvania Malleable Co.; leased by Pressed Steel Car Co., July 1, 1909.) Product: steel castings for sale, annual cap., 7,200 tons; malleable iron castings, annual cap., 20,000 tons; car couplers, cast iron car wheels.

Prime Steel Co., Milwaukee, Wis.; formerly operated 2 steel casting plants at Milwaukee—1 plant on Chicago Ave., blt. 1906, crucible steel castings, and 1 plant on Kinnickinnic Ave., (formerly operated by Dutcher Co., and later by the Dutcher Steel Casting Co.) O. H. and crucible steel castings; both plants acquired by Harris Bros. of Chicago in 1915; Chicago Ave. plant sold to Pelton Steel Co., Dutcher plant dismantled.

PRIMOS CHEMICAL CO., Primos, Pa.

Org., 1899; inc. Sept., 1901. Capital stock: com. \$350,000; pref. auth. \$150,000, issued \$145,100.

Walter M. Stein, P.; John J. Boericke, Sc.; Gideon Boericke, T. Works at Primos, Pa.: blt. 1899; f. o. Feb. 11, 1899; partially destroyed by fire Aug., 1912; rebld. and f. o. Sept. 12, 1912; 67 4-pot crucible fur.; 3 cont. melting fur.; 7 reverberatory fur.; 2 tilting fur.; 1 electric fur. Fuel, coal, coke and prod. gas.

Product: tungsten metal, molybdenum metal, ferro-tungsten, ferro-molybdenum, ferro-vanadium, oxides and salts of tungsten, molybdenum and vanadium.

PRINCESS FURNACE CO., INC., Glen Wilton, Va.

Org. and inc. May 15, 1906. Capital stock: com. \$200,000; pref. \$300,000; bonds \$65,000.

Wm. S. Rowe, P.; James A. Green, V. P.; E. M. Radway, T.; at Cincinnati, Ohio. J. Banks Hudson, M.; at Glen Wilton, Va. Brand: "Princess."

Princess Furnace, Glen Wilton, Va.: 1 stack, 65' x 15', blt. 1883-84, rebt. 1912; 3 2-pass Foote stoves, 60' x 15'; 1 3-pass McClure stove, 65' x 19'; 2 steam blowing eng. (24,000 cfm.); 6 boilers (5 water-tube, 1 tubular) 1,250 H. P. New River coke; local ore. 1 rotary kiln nodulizing fur. working on pyrites cinder (foreign), annual cap., 12,000 tons.

Company owns iron ore mine in Botetourt County, Va., annual cap., 50,000 tons.

Product: soft, strong, and very fluid foundry pig iron, annual cap., 36,000 tons.

Principio Forge Co., formerly operated under lease a charcoal bloomary at Principio Furnace P. O., Md.; plant leased and now operated by the Tyler Tube and Pipe Co., Washington, Pa.; see 1908 Directory, p. 323.

Providence Steel Casting Co., see 1908 Directory, pp. 236, 480. Plant sold at receiver's sale in August, 1908. Converters dismantled in 1909. Buildings used for other purposes.

Provincial Steel Co., Ltd. (The), Cobourg, Ont., Canada, built a rolling mill at Cobourg in 1909 for rerolling rails and rolling merchant bars and concrete bars. Property acquired by the A. R. Williams Machinery Co., Ltd., Toronto, in 1914. Rail-rerolling machinery and power engines sold and transferred to Port Moody, B. C.

PUGET SOUND IRON AND STEEL WORKS (The), Tacoma, Wash. Org. and inc. Dec. 9, 1895. Capital stock: \$30,000.

John L. Roberts, P., T. & G. M.; E. D. Roberts, V. P.; A. C. Marconnier, Sc. & P. A.; John L. Roberts, T. & G. M.; Thomas S. Morrissey, G. S.

Selling agents:

Portland, Oregon, F. B. Mallory Co.

San Francisco, Cal., Leland Equipment Co.

Seattle, Wash., 536 First Ave., So. (Branch office.)

Vancouver, B. C., Gibson's Ltd.

Works at Tacoma, Wash.: blt. 1895; one 5,000-lb. modified Bessemer converter added 1910; first steel made Dec., 1910; 3 cupolas. Fuel, coke. Machine shop for jobbing and for the manufacture of logging, hoisting, and mine engines. Gray iron and brass foundry.

Product: steel castings for sale; also manganese and high carbon steel castings; annual cap., 2,400 tons steel castings.

PULASKI IRON CO., Real Estate Trust Bldg., Philadelphia, Pa.

Inc. Mar. 17, 1884. Capital stock: \$450,000.

Horace L. Haldeman, P.; E. P. Borden, V. P., Sc. & T.; at Real Estate Trust Bldg., Philadelphia, Pa. Percival Johnson, G. M.; at Pulaski, Va.

Brand: "Pulaski."

Furnace at Pulaski, Va.: 1 stack, 74' x 18', blt. 1887; f. o. Feb., 1888; rebt. 1898; to be rebt. in 1916, 80' x 17'9"; 4 Whitwell stoves; 3 steam blowing eng. (27,720 cfm.): 8 water-tube boilers, 1,700 H. P. Pocahontas coke; local ore. Company owns iron ore mines in Virginia and Northern Georgia; also limestone quarries in Virginia; coal mine and 260 bee-hive coke ovens at Eckman, W. Va., with an annual cap. of 96,000 net tons of coke.

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

PULLMAN CO. (The), Chicago, Ill.

Org. and inc. Feb. 22, 1867. Capital stock: \$120,000,000.

J. S. Runnells, P.; Richmond Dean, V. P.; Le Roy Kramer, V. P.; A. S. Weinsheimer, Sc.; L. S. Taylor, T.; William Hough, A.; E. R. Slagle, G. S. M.; A. P. Bowen, P. A.

The company owns and operates a large carbuilding works at Pullman, 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.

Works at Pullman, Ill.: blt. 1883-84; 2 forge fires; 3 gas heat. fur.; 7 coal heat. fur. (6 3-d. 1 4-d.); 3 trains (18" 3-h. 3-st. bar, 10" 3-h. 4-st. guide, 8" 3-h. 4-st. guide). Fuel, coal and mfd. gas.

Product: scrap bar, car and merchant iron and steel and special shapes. Annual cap., 15,000 tons scrap bar, 60,000 tons bar iron.

PUNXSUTAWNEY FURNACE CO., lessee, DuBois, Pa.

Org. April 1, 1912; inc. July 15, 1912. Capital stock: \$300,000.

L. W. Robinson, P.; at Punxsutawney, Pa. T. W. Kennedy, V. P., G. M., & P. A.; F. G. St. Clair, Sc., T. & A.; J. G. Miller, G. S. M.; at DuBois, Pa.

Brand: "Punxy."

Punxy Furnace, Punxsutawney, Pa.: 1 stack, 80' x 18', blt. 1896-97; f. o. Sept. 29, 1897; 4 80' x 18' Kennedy center-combustion stoves; steam blowing eng. Coke; Lake ore. (Formerly owned and operated by Punxsutawney Iron Co.; acquired April 1, 1912, by Rochester and Pittsburgh Coal and Iron Co.; leased to Punxsutawney Furnace Co., April 1, 1912.)

Product: foundry and forge pig iron, annual cap., 75,000 tons.

Punxsutawney Iron Co. sold Punxy Furnace at Punxsutawney, Pa., to the Rochester & Pittsburgh Coal and Iron Co., April 1, 1912.

Quinn Furnace Co., see 1908 Directory, p. 349. Quinn Furnace at Gadsden, Ala., sold by trustees in bankruptcy under a mortgage decree, Oct. 11, 1909, to P. P. Williams and James F. Hunter of Memphis, Tenn., holders of the mortgage. Furnace dismantled in Dec., 1911.

Racine Iron and Metal Co., Racine, Wis.

M. L. Fox, P. & T.; K. Fox, V. P.; Nate I. Silver, Sc. & G. M. Works at South Milwaukee: blt. 1892; rebt. 1901; 7 busheling fur. (6 single, 1 double); 3 heat. fur.; 3 trains (16" 3-h. 1-st. roughing, 10" and 9" finishing). Fuel, coal. Annual cap., 35,000 tons of bar iron. *Long idle and for sale or lease.* Address A. C. Pond, Com. Savings Bank, Racine. (Formerly owned by Eagle Horse Shoe Co.: acquired by Racine Iron & Metal Co., May 18, 1910.)

RACINE STEEL CASTINGS CO., Racine, Wis.

Org. and inc. Aug. 18, 1908. Capital stock: \$10,000; all owned by Belle City Malleable Iron Co.

J. A. Chapman, P.; at Chicago, Ill. J. H. Dwight, V. P. & G. M.; C. S. Anderson, Sc. & T.; G. M. Goepfert, G. S.; at Racine.

Works at Racine: blt. 1908; 7 4-pot crucible fur.; first crucible steel made Oct. 8, 1908; adding one 3-ton Heroult electric fur. Fuel, oil. Malleable iron foundry.

Product: steel castings for sale; annual cap., 600 tons crucible, 3,000 tons electric. Malleable iron castings, annual cap., 10,000 tons.

Radford Iron Co., see 1908 Directory, p. 326; 1910 Supplement, p. 22; 1912 Supplement, p. 36. Radford Furnace at Allisonia, Va., last active in 1900, abandoned and in ruins.

RAIL JOINT CO. (The), 61 Broadway, New York, N. Y.

Org. 1905. Capital stock: com. \$2,000,000; pref. \$2,000,000. Frederick T. Fearey, P.; George G. Frelinghuysen, Ch. Ex. Com.; L. F. Braine, Percy Holbrook, W. Paton Thomson, V. P.; F. C. Runyon, T.; Benjamin Wolhaupter, Sc.

Sales offices:

Boston, India Bldg.

Chicago, Railway Exchange Bldg.

Denver, Equitable Bldg.

New York, 185 Madison Ave.

Philadelphia, Pennsylvania Bldg.

Pittsburgh, Oliver Bldg.

Portland, Ore., Wilcox Bldg.

St. Louis, Commonwealth Trust Bldg.

Troy, N. Y., Burden Ave.

London, England, 36 New Broad St., E. C.

Montreal, Canada, Board of Trade Bldg.

Product: base-supported and 100% rail joints for standard, girder and special rail sections; also joints for frogs and switches, insulated rail joints, and step or compromise rail joints.

Albany Iron and Steel Works Dept., Troy, N. Y.: orig. blt. 1819; 2 cont. billet heat. fur.; 2 cont. re-heat. fur.; two 21" 2-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, the company has nine other distributing points where its patented machinery and devices are used to produce rail joints under contract with other mills. Delivery points are, Milwaukee, Wis.; Joliet, and So. Chicago, Ill.; Columbus, Ohio; Pittsburgh, Johnstown and Steelton, Pa.; New Castle, Del.; New York City and Troy, N. Y.

RAILWAY STEEL-SPRING CO., 30 Church St., New York, N. Y.

Org. and inc. Feb. 25, 1902. Capital stock: com. \$13,500,000; pref. 7% cum., \$13,500,000; bonds \$6,628,000.

F. F. Fitzpatrick, P.; A. S. Henry, V. P.; S. T. Fulton, V. P.; M. B. Parker, Sc.; E. McCormick, T.; J. L. Suffern, A.; H. Inman, P. A.

Sales offices:

Chicago, Ill., Denver, Colo., Detroit, Mich., Louisville, Ky., New Orleans, La., Norfolk, Va., St. Louis, Mo., St. Paul, Minn.

Brand: "Latrobe."

Product: merchant steel, locomotive and car wheel tires, steel rings and flanges, elliptical and coil springs for locomotive, passenger and freight equipment, machinery springs, vanadium and chrome-nickel alloy steel ingots.

Latrobe Plant, Latrobe, Pa.: blt. 1888-89; f. o. Aug., 1889; 5 A. O. H. fur., (two 20, one 30, and two 40-ton) first steel made, Aug. 5, 1889; 5 2-d., 4 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 for sale and own use, also vanadium and chrome-nickel alloy steel ingots. Annual cap., 65,000 tons ingots, 50,000 tons locomotive and car wheel tires, steel rings, etc.

Detroit Works, Steel Department, Michigan and Hubbard Aves., Detroit, Mich.: f. o. May, 1882; 7 2-d., 4 3-d. heat. fur.; 3 trains (18" 3-h. 4-st., 12" 3-h. 1-st., 9" 3-h. 4-st.). Fuel, bit. coal. Machine shop for own use.

Product: merchant steel, annual cap., 40,000 tons.

Inter-Ocean Plant, Chicago Heights, Ill.: blt. 1909-10; first steel made, April 20, 1910; first products rolled, June 15, 1910; 3 50-ton B. O. H. fur.; 1 2-d. and 2 cont. heat fur., 3 pit fur.; 3 tire mills; 1 hydraulic forging press. Fuel, mfd. gas. Machine shop for own use. (Formerly operated by the Inter-Ocean Steel Co., acquired by the present owners, Oct. 2, 1911.)

Product: ingots, locomotive and car wheel tires, and car wheels with rolled steel tires. Annual cap., 60,000 tons ingots.

The company operates the following steel-spring works: Chicago Works, Chicago Heights, Ill.; French Works, Liberty Ave. and Twentieth St., Pittsburgh; National Works, Oswego, N. Y.; Scott Works, Germantown Ave. and New Market St., Philadelphia; and St. Louis Works, Lansdowne, East St. Louis, Ill. These works produce elliptical and coil springs for locomotive, passenger, and freight equipment; machinery springs, etc. Total annual capacity, 100,000 gross tons of springs.

The company also operates the following steel-tired wheel works: Denver Works, Denver, Col.; Depew Works, Depew, N. Y.; Hudson Works, Hudson, N. Y.; Pullman Works, Pullman, Ill.; and Scranton Works, Scranton, Pa. Product: steel-tired engine, truck, tender, coach and motor wheels. Total annual cap., about 69,500 steel-tired wheels.

Reading-Bayonne Steel Casting Co.; capital stock: \$500,000 com., \$250,000 7% cum. pref.; consolidation on Dec. 1, 1911, of 2 steel casting plants, one at Reading, Pa., formerly operated by Reading Steel Casting Co., and one at Bayonne, N. J., formerly operated by Bayonne Steel Casting Co.; plant at Reading, Pa., re-acquired May 10, 1915, by Reading Steel Casting Co., and plant at Bayonne, N. J., by Bayonne Steel Casting Co.: see 1908 Directory, p. 270; also 1912 Supplement, pp. 18-19.

READING IRON CO., Baer Bldg., Reading, Pa.

Org. and inc. Aug. 12, 1889. Capital stock: \$1,000,000; bonds \$758,500.

F. C. Smink, P.; George Schuhmann, V. P. & G. M.; George W. Delany, Sec.; J. M. Callen, A. G. M.; Frederick Butler, T.; Paul E. Butler, A.; E. J. Mishler, S. M.; G. F. D. Hallman, P. A. Selling agents: New York, 28 Platt St., A. B. Richards; Philadelphia, Drexel Bldg., A. R. Kinsler.

Products: pig iron, merchant iron bars, angle bars, tie plates, wrought iron pipe, charcoal iron boiler tubes; muck bar and skelp for own use.

BLAST FURNACES.

Keystone Furnace Dept., Reading, Pa.: 1 stack, blt. 1898-99, rebld. 1913, 80' x 18'; 4 Massicks & Croke stoves, 75' x 19' 6"; 4 steam blowing eng. (32,000 cfm.); 4 batteries water-tube boilers, 2,000 H. P. Coke; Lake, local hematite, N. J. magnetite and Swedish ore. Product: foundry and forge pig iron, annual cap., 110,000 tons.

Crumwold Furnace Dept., Emaus, Pa.: 1 stack, blt. 1872, rebld. 1909; 75' x 17'; 3 Roberts stoves, 80' x 20'; 2 steam blowing eng. (20,000 cfm.); 4 bat. water-tube, 2 bat. cylindrical boilers, 1,500 H. P. Coke: N. Y. and N. J. magnetite, Lake and Swedish ore. Product: foundry and forge pig iron, annual cap., 70,000 tons. Total pig iron capacity, 180,000 tons.

ROLLING MILLS, TUBE WORKS, ETC.

- Montour Rolling Mills Dept., Danville, Pa. : blt. 1845, reblt. 1901-02; 21 double and 1 single puddling fur.; 6 3-d. heat. fur.; 7 trains (four 20" 3-h. 1-st. muck, 20" 3-h. 3-st. bar and skelp, 16" 3-h. 2-st. bar, 12" 3-h. 5-st. bar). Fuel, anth. and bit. coal. Product: muck bar, merchant bar iron, angles, tie plates, angle and plain splice bars, grooved skelp. Annual cap., 28,000 tons muck bar; 60,000 tons finished rolled products.
- Danville Puddle Dept., Danville, Pa. : blt. 1883; 8 double puddling fur.; 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. : blt. 1868, last remod. 1902; 17 double puddling fur.; 2 squeezers; 6 4-d. Laughlin gas heat. fur.; 3 trains (23½" 3-h. 2-st. muck, 15" 3-h. 3-st. skelp, and a universal mill with 22" 1-st. roughing, 23" 1-st. finishing). Fuel, bit. coal. Product: muck bar, skelp, socket and tool iron. Annual cap., 24,000 tons muck bar, 70,000 tons finished rolled products.
- Oley Street Mills Dept., Reading, Pa. : blt. 1896-7, enl. 1906; 33 double puddling fur.; 4 3-d. gas heat. fur.; 2 coal-fired fagot heat. fur.; 3 trains (two 20" 3-h. 2-st. muck, 22" 3-h. 1-st. universal). Fuel, bit. coal. Product: muck bar (annual cap., 50,000 tons) and skelp (annual cap., 40,000 tons).
- Sheet Mill Dept., Reading, Pa. : blt. 1863; 12 double puddling fur.; 4 1-d. heat. fur.; 2 trains (22" 2-h. 1-st. muck, 22" sheared plate mill with one roughing and one finishing stand). Fuel, bit. coal. Charcoal bloomary: blt. 1910, first blooms made May 24, 1910; 12 knobbling fires; 1 hammer (4,500-lb.). Product: muck bar, sheared skelp, and charcoal boiler tube iron. Annual cap., 20,000 tons muck bar, 12,000 tons skelp.
- Tube Works Dept., Reading, Pa. : blt. 1856, last reblt. 1906; 9 pipe mills. Product: wrought iron pipe, boiler tubes, oil well tubing and casing, trolley poles, etc.; pipe from ½" to 20" dia. Annual cap., 175,000 tons.
- Scott Foundry Dept., Reading, Pa. : blt. 1854, enl. 1906; 1 Tropenas converter (2-ton), blt. 1910, first steel made Oct. 18, 1910. Product: steel castings for own use only, annual cap., 2,500 tons. Gray iron foundry for rolling mill and general machinery castings, annual cap., 20,000 tons.
- Forge Dept., Reading, Pa. : blt. 1850, reblt. 1901, several hammers (15-ton, 6-ton, 5-ton, 3-ton, several smaller). Product: marine, engine, cotton-press and general iron and steel forgings; annual cap., 5,000 tons light, and 100,000 tons heavy forgings.

IRON-ORE MINES, COAL LANDS, AND OTHER PROPERTIES.

The Reading Iron Company owns iron ore rights in Albemarle, Amherst, and Nelson Counties, Virginia, aggregating 3,400 acres; also the Big Pond Furnace lands in Cumberland County, Pa., con-

taining 5,923 acres. The company also owns 7,538 acres of coal lands at Kimmelton, Somerset County, Pa., which are in operation and are producing daily about 1,000 tons of bituminous coal.

In addition to the above the company owns 260 acres of timber and ore lands at New Ringgold, Schuylkill County, Pa., and 600 acres of timber and farming lands at Millerstown, Perry County, Pa.

READING STEEL CASTING CO., Reading, Pa.

Org. Nov. 23, 1911; inc. Nov. 27, 1911. Capital stock: com. auth. \$500,000, issued \$162,900; pref. auth. \$250,000, issued \$74,000; bonds \$50,000.

J. Turner Moore, P., G. M., & P. A.; M. G. Moore, V. P. & G. S. M.; H. M. Doty, Sc. & T.; J. Douglas Genger, S.

Works at Reading: blt. 1901, f. o. May 1, 1901; 4 2-ton Tropenas converters; 1 cupola. Fuel, coal and coke. Machine shop for own use. (Formerly operated by the Reading Steel Casting Co.; acquired by the Reading-Bayonne Steel Casting Co. Dec. 1, 1911; reacquired by present company May 10, 1915.)

Product: steel castings for sale, also alloy-treated steel castings, annual cap., 7,200 tons.

REDCLIFF ROLLING MILLS & BOLT CO., LTD. (The), Redcliff, Alberta, Canada.

Org. and inc. 1913. Capital stock: \$250,000.

W. B. Marshall, P.; Dr. J. C. Hargrave, V. P.; H. A. Hunter, Sc. & T.; at Medicine Hat, Alberta. Leonard J. McLean, G. M.; T. Freed, G. S.; at Redcliff, Alberta.

Works at Redcliff, Alberta: blt. 1913; f. o. Oct., 1913; 1 single puddling fur.; 3 busheling fur.; 1 4-d. heat. fur.; 18" 3-h. 1-st., 14" 3-h. 1-st. roughing, 10" 3-h. 4-st. merchant mills. Fuel, nat. gas. Machine shop for own use. (Plant for the manufacture of bolts and nuts being installed.)

Product: bar, angle, and channel iron, annual cap., 10,000 tons.

RED RIVER FURNACE CO., Clarksville, Tenn.

Org. 1901. Capital stock: com. \$100,000; pref. 7% cum. \$100,000; bonds, \$35,000.

G. Macfarlane, P.; H. L. Williams, V. P.; R. B. Hickman, Sc.; at Louisville, Ky.

Selling agents: Hickman, Williams & Co.

Brands: "Red River," "Helen."

Helen Furnace at Clarksville: 1 stack; blt. 1892, f. o. Dec. 8, 1895; 70' x 15' 6"; 3 Whitwell stoves; 3 steam blowing eng.; 1 slag granulating pit. Coke; local brown ore from company's mines.

Product: foundry, high-silicon and Tennessee-Scotch pig iron, annual cap., 30,000 tons high-silicon or 50,000 tons foundry.

REED FOUNDRY AND MACHINE CO., Kalamazoo, Mich.

Inc. 1913. Formerly known as Reed Manufacturing Co.; corporate title changed May 12, 1913. Capital stock: auth. \$100,000, issued \$50,000.

Joseph E. Brown, P.; J. E. Welborn, Sc.; B. W. Raseman, T.; at Kalamazoo. E. E. Reed, V. P.; at Oakfield, N. Y.

Works at Kalamazoo: crucible steel furnaces blt. 1907 have been abandoned but not completely dismantled; one converter (1½ ton), 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.

Reed Manufacturing Co., Kalamazoo, Mich., corporate title changed to Reed Foundry and Machine Co., May 12, 1913.

REEVES MANUFACTURING CO., Canal Dover, Ohio.

Org. and inc. 1900. Capital stock: \$1,000,000.

H. C. Greer, P.; at Morgantown, W. Va. James Rees, V. P.; Jos. A. Krantz, Sc.; Arthur J. Krantz, T.; Albert H. Reeves, S.; at Canal Dover.

Dover Rolling Mill at Canal Dover: blt. 1903-04, f. o. Oct. 13, 1904; 2 double puddling fur.; 1 scrap fur.; 3 3-d. heating fur.; squeezer; 20" 3-h. 2-st. skelp mill; 7 28" black sheet mills, first sheets made June 3, 1912; 7 comb. heat. fur.; 4 26" single-stand cold mills; 4 box annealing fur.; 1 Mesta 3-arm pickling mach.; 4 galvanizing pots for galvanizing sheets. Fuel, coal.

Forge: blt. 1903-04, f. o. Oct. 19, 1904; 10 knobbling fires, one hammer (5,000-lb.) Make charcoal blooms for own use and for sale, annual cap., 12,000 tons. (Formerly owned by The Dover Forge and Iron Co.; acquired by the Reeves Manufacturing Co., April, 1911.)

Product: iron forging billets, iron sheet bars; charcoal iron blooms, sheet bars, and skelp; iron and steel sheets, black and galvanized. Annual cap., 15,000 tons billets and bars, 10,000 tons skelp and 35,000 tons sheets.

Refined Iron and Steel Co., Inc., see 1908 Directory, p. 299, went into hands of receiver in August, 1908; plant at Wireton, Pa., acquired at receiver's sale, June 5, 1911, by John W. McKinnon, Pittsburgh, and dismantled in 1914.

REILY, JOHN W. (owner), Fort Hunter, Dauphin County, Pa.

Lucknow Forge at Lucknow, Pa.: blt. 1883, f. o. Dec. 10, 1883; 10 forge fires; 1 heat. fur.; 1 run-out fire; 1 steam ham. Fuel, charcoal. (Formerly operated under lease by Lucknow Iron and Steel Co.)

Product: charcoal blooms from pig iron and scrap, annual cap., 6,500 tons.

RELIANCE STEEL CASTING CO., Pittsburgh, Pa.

Org. and inc. 1910. Capital stock: \$200,000.

J. A. Kelly, P.; E. A. Blasdel, Sc., T., & G. M.

Works at 28th and Smallman Sts., Pittsburgh: blt. 1910, first steel made Jan. 2, 1911; 1 A. O. H. fur. (15-ton). Fuel, nat. gas. Machine shop for jobbing.

Product: steel castings and alloy steel castings for sale, annual cap., 6,000 tons.

Reliance Steel Foundry Co., see 1908 Directory, p. 254, sold by receiver to committee representing the bondholders and subsequently purchased by the Bayonne Steel Casting Co. The open hearth furnace was dismantled and the remainder of the plant moved to Bayonne, N. J., in 1910.

REPUBLIC IRON AND STEEL CO., Republic Bldg., Youngstown, Ohio.

Inc. May 3, 1899. Capital stock: com. auth. \$30,000,000, issued \$27,191,000; pref. 7% cum. auth. and issued \$25,000,000; bonds \$17,833,000.

John A. Topping, Ch.; at 17 Battery Place, New York. T. J. Bray, P.; H. L. Rownd, V. P.; R. Jones, Jr., Sc.; H. M. Hurd, T.; Charles M. Pierce, A.; J. W. Deetrick, G. M.; P. J. Gordon, G. S.; C. T. Johnston, G. S. M.; C. I. Starrett, P. A.; G. C. Shackleford, C. E.; at Youngstown.

Sales offices:

Birmingham, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco, Seattle.

Product: pig iron, blooms, slabs, billets, sheet bars, skelp, pipe, sheared plates, merchant bars, reinforcing bars, shapes, small I beams, channels, cold rolled shafting, spikes, turnbuckles, bolts, nuts, washers, etc.

Haselton Furnaces, Youngstown, Ohio: 4 stacks. No. 1, blt. 1867, last rebt. 1913, 74' 5" x 15' 8"; No. 2, blt. 1905-06, last rebt. 1914, 85' x 20'; No. 3, blt. 1905-06, last rebt. 1914, 85' x 21'; No. 4, blt. 1910-11, last rebt. 1914, 90' x 22'. No. 1 has 1 side combustion and 3 Julian Kennedy central combustion stoves, 102' 10" x 22'; Nos. 2 and 3 have each 4 Julian Kennedy central combustion stoves, 97' 10" x 22'; No. 4 has 4 Julian Kennedy central combustion stoves 102' 10" x 22'; 13 steam blowing eng. (209,633 cfm.); 29 water-tube boilers, 14,000 H. P.; 2 double-strand Uehling casting machines; 4 slag granulating pits. Blacksmith, plate and machine shops for own use. Conn. and by-product coke; Lake ore. Molten metal to Bessemer and open hearth steel plants, see below. Product: Bessemer and basic pig iron, annual cap., 605,000 tons.

Plan to add a fifth stack in 1916, 95' x 22', annual cap., 215,000 tons.

Hannah Furnace, Youngstown, Ohio: 1 stack, blt. 1880, last rebt. 1913, 75' 6" x 15' 3"; 3 Kennedy side-combustion (80' x 18') and 2 Massicks & Crooke stoves (one 70' x 18', one 85' x 18'); 3 steam blowing eng. (49,133 cfm.); 8 water-tube boilers, 2,600 H. P.; 1 slag granulating pit. Coke; Lake ore. Machine, blacksmith and plate shop for own use. Product: Bessemer pig iron, annual cap., 120,000 tons.

Atlantic Furnace, New Castle, Pa.: 1 stack, blt. 1868, last rebt. 1913, 75' x 15' 6", 4 side-combustion stoves, 80' x 18'; 3 steam blowing eng. (45,302 cfm.); 6 water-tube boilers, 2,400 H. P.; 1 slag granulating pit. Coke; Lake ore. Machine, blacksmith and plate shops for own use. Product: Bessemer pig iron, annual cap., 120,000 tons.

Hall Furnace, Sharon, Pa.: 1 stack, blt. 1845, last rebt. 1910, 62' x 14' 6", 5 iron-pipe stoves; 3 steam blowing eng. (24,545 cfm.); 9 boilers (1 water-tube, 8 flue) 750 H. P. Coke; Lake ore. Machine and blacksmith shops for own use. Product: Bessemer, basic (in chills), mill and foundry pig iron, annual cap., 50,000 tons.

Pioneer Furnaces, Thomas, Ala.: 3 stacks. No. 1, blt. 1886-88, last rebt. 1914, 85' x 20'; No. 2, blt. 1889-90, last rebt. 1913, 90' x 18'; No. 3, blt. 1901-02, last rebt. 1911, 85' x 20'; 12 Massicks and Crooke stoves, 85' x 21'; 14 steam blowing eng. (196,000 cfm.); 22 water-tube boilers, 9,400 H. P.; 1 double-strand Uehling casting machine. Machine and blacksmith shop for own use. Coke from own ovens at Thomas and Republic, Ala.; local red and brown hematite from own mines. Product: foundry and mill pig iron, annual cap., 315,000 tons.

Total annual cap. of the 10 blast furnaces, 1,210,000 tons.

Open Hearth Steel Works, Youngstown, Ohio: blt. 1910-13; 12 B. O. H. fur. (70-ton); 1 mixer (400-ton) molten metal from Haselton Furnaces; 5 soaking pits; 5 trains (40" 2-h. 1-st. blooming mill; 21" 2-h. 4-st. cont. billet mill; 18" 2-h. cont. combination mill, 6 st. for billets, 6 st. for sheet bars; 16" 2-h. cont. merchant mill with 16" 8-st. and 14" 3-st.; 90" 3-h. plate mill). First ingots made June 12, billets June 13, sheet bars June 16, and plates Nov. 29, 1911; first merchant products, Jan. 2, 1912. Fuel, coal and natural, producer and coke-oven gas. Machine, blacksmith and plate shops for own use. Product: ingots, blooms, billets, sheet bars, plates (boiler, tank, ship and bridge), skelp, rounds, ovals, half ovals, flats, angles, Z bars, small channels and I beams. Annual cap., 575,000 tons of ingots.

Bessemer Steel Works, Youngstown: blt. 1900; first steel made Sept. 10, 1900, enl. 1902-03; 2 Bessemer converters (10-ton); 6 cupolas; mixer (250-ton) hot metal from Haselton Furnaces; 5 4-hole soaking pits; 4 trains (40" 2-h. 1-st. blooming; 26" 2-h. 3-st. semi-cont. billet; 28" sheet bar mill with 28" 3-h. 1-st., 28" 2-h. 1-st., 18" 2-h. 1-st.; 18" 2-h. 4-st. cont. billet). Fuel, coke,

coal, producer gas. Machine, blacksmith and plate shops for own use. Product: ingots, billets, sheet and tinplate bars, and flats. Annual cap., 725,000 tons of ingots.

Brown-Bonnell Works, Youngstown: est. 1846, rebld. and enl. 1902-13; 9 cont. heat. fur. (4 Morgan, 2 Laughlin, 3 own design); 8 trains, (20" skelp mill with 20" 3-h. 1-st. roughing, 20" 3-h. 1-st. strand, 20" 2-h. 1-st. finishing; 20" bar mill with 20" 3-h. 1-st. roughing, 20" 3-h. 1-st. strand, 20" 2-h. 1-st. finishing; 12" bar mill with 12" 3-h. 1-st. roughing, 12" 3-h. 2-st. strand, 12" 3-h. 1-st. and 12" 2-h. 1-st. finishing; 10" cont. mill with 10" 2-h. 2-st. roughing, 10" 3-h. 7-st. strand and finishing; 10" to 8" hoop mill with 10" 3-h. 1-st. roughing, 10" 3-h. 3-st. strand, 8" 3-h. 2-st. and 10" 2-h. 1-st. finishing; 12" to 10" cont. skelp mill with 12" 2-h. 2-st. hor., 12" 2-st. vert., and 10" 2-h. 3-st. hor. roughing, 12" 1-st. edging, 10" 2-h. 3-st. finishing; 8" cont. mill with 10" 2-h. 4-st. roughing, 8" 2-h. 1-st. and 8" 3-h. 4-st. strand and finishing; 7" cont. mill with 10" 2-h. 5-st. roughing, 7" 2-h. 2-st. and 7" 3-h. 4-st. strand and finishing). Installing one 10" Morgan cont. mill with 10" 2-h. 4-st. roughing, 10" 3-h. 3-st. strand, 10" 2-h. 1-st. strand, 10" 2-h. 1-st. finishing from Sylvan Works. Spike and washer dept.: 10 spike mach., 7 washer mach. Fuel, coal, natural and producer gas. Machine, blacksmith and plate shops for own use. Product: merchant steel bars, hoops, angles, spikes and washers. Annual cap., 450,000 tons of rolled products, 15,000 tons of spikes, 1,800 tons of washers.

Mahoning Valley Works, Youngstown: Puddle mill and rolling mill dismantled in 1913 and 1914. 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. Gray iron foundry for own use, annual cap., 2,500 tons.

Haselton Steel Tube Works, Youngstown: bld. 1909-10, f. o. April, 1910; 2 butt-weld and 2 lap-weld furnaces; 18 gas producers; 1 galvanizing pot. Electric power from Haselton Furnaces. Machine pattern and blacksmith shop. Fuel, coal, prod., nat. and coke-oven gas. Make butt-weld pipe $\frac{1}{4}$ " to 3"; lap-weld, 2" to 13" O. D. Adding butt-weld mill to make down to $\frac{1}{8}$ " pipe and lap-weld mill to make up to 16" pipe. Product: standard, extra strong, double extra strong, tubing, casing, drive and misc. pipe, annual cap., 175,000 tons.

Inland Works, East Chicago, Ind.: bld. 1889, recently remod.; 5 single and 11 double puddling fur.; 8 heat. fur. coal-fired (6 3-d., 2 4-d.); 5 trains (22" 3-h. 2-st. muck; 18" bar with 18" 3-h. 2-st. roughing and strand, 18" 2-h. 1-st. finishing; 16" bar with 16" 3-h. 2-st. roughing and strand, 16" 2-h. 1-st. finishing; 9" merchant with 14" 3-h. 1-st. roughing, 14" 3-h. 1-st. strand, 9" 3-h. 3-st. strand, 9" 2-h. 1-st. finishing; 8" merchant mill with 10" 3-h. 1-st. roughing, 8" 3-h. 3-st. strand, 8" 2-h. 1-st. finishing).

✓ Fuel, coal. Machine and blacksmith shop for own use. Product: bar iron, annual cap., 60,000 tons.

Sylvan Works, Moline, Ill.: blt. 1894, remod. 1908; 1 Morgan cont. gas-fired heat. fur.; 1 coal-fired cont. heat. fur.; 2 trains (12" old rail mill with 16" 3-h. 1-st. slitting and roughing, 12" 3-h. 4-st. strand, 12" 3-h. 2-st. and 12" 2-h. 1-st. finishing.) Fuel, coal and prod. gas. Machine and blacksmith shop for own use. Product: soft and hard merchant steel, steel agricultural shapes, etc., annual cap., 50,000 tons.

Indiana Bolt Works, Muncie, Ind. Product: bolts, nuts, and washers. Bolts, usual sizes for carriages, machinery, plows, coaches, etc.; nuts, usual sizes and all kinds. Gimlet-pointed coach screws. Annual cap., 17,000 tons. Brazil wrought iron open hexagonal turnbuckles, annual cap., 1,200 tons.

The following works have been dismantled:

Alabama Works, Gate City, Ala., in 1912.

Birmingham Mill, Birmingham, Ala., in 1910.

Corns Works, Massillon, Ohio, in 1910.

Toledo Works, East Toledo, Ohio, in 1911-12.

Tudor Works, East St. Louis, Ill., in 1912.

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 Monica mines in the Mesabi range. The estimated annual cap. of these mines is 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 and 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: Alfretha (4 slopes), Raimund (3 slopes), Houston, Tannehill and Spaulding. The company also owns a one-half interest in the Potter Ore Co.

COAL AND COKE PROPERTIES.

By-product Coke Works, consisting of 143 Koppers ovens, were built at Youngstown, Ohio, in 1913-15, and first operated in April, 1914. The plant has an annual cap. of 700,000 net tons of coke. A benzol plant of the Otto type, annual cap., 930,000 gallons, is connected with the works.

The company owns coking coal lands in Fayette Co., Pa., where it operates 766 bee-hive coke ovens—120 at Gans, 400 at Republic and 246 at Martin, with an annual cap. of 546,750 net tons.

The company also owns about 1,900 acres of steam coal lands in Washington County, Pa.

In Alabama the company owns and operates the Warner, Sayreton, Thompson, Thomas and Palos mines and 1,010 bee-hive coke ovens, 910 at Thomas and 100 at Republic, with an annual cap. of 606,000 net tons of coke.

The Republic Iron and Steel Co. owns an interest in the Lake Erie Limestone Co. and the Union Limestone Co., which operate quarries near Carbon, Pa.; also owns and operates the Dale quarry at Dale, Ala., and the Dolomite quarry at Thomas, Ala.

The company owns an interest in the Republic Transportation Co. and 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., the General Water Co. and the Jefferson Powder Co.

RHODE ISLAND CRUCIBLE STEEL CO., 477 Main St., Pawtucket, R. I. Org. May, 1910; not inc.

Carl A. Hagstrom, P.; Carl U. Svecker, T.; G. C. Hagstrom, G. M. Works at 477 Main St., Pawtucket: blt. 1910, first crucible steel made May 16, 1910; two 8-pot crucible fur. Fuel, oil.

Product: steel castings for sale for automobiles and machinery parts; vanadium, chrome and nickel alloy steel castings; annual cap., 600 tons.

RHODE ISLAND-PERKINS HORSE SHOE CO., Grosvenor Bldg., Providence, R. I.

Inc. Oct. 29, 1891. Capital stock: com. \$1,000,000; pref. 7% cum. \$1,750,000.

Frederick E. Perkins, P.; Charles R. Stark, Sc. & T.; Charles H. Perkins, Jr., G. M.

Brand: "Perkins."

Works at Valley Falls, R. I.: 7 scrap fur.; 8 3-d. heat. fur.; 6 trains (18" 2-h. 1-st. and 18" 3-h. 1-st. muck mills, four 9" bar mills); 28 horseshoe mach. Fuel, bit. coal.

Product: horseshoe bars for own use; horse and mule shoes, toe calks; annual cap., s. t., 18,000 tons bars.

Rhodes, Curry & Co., Ltd., see Canadian Supplement, 1908, p. 6, merged in Canadian Car and Foundry Co. in Nov., 1909.

RICHMOND IRON WORKS, Richmond Furnace, Mass.

Org. and inc., April 1, 1905. Capital stock: \$80,000; bonds \$5,000.

Samuel G. Colt, P. & T.; Ray C. Williams, V. P. & Sc.

Selling agents: Rogers, Brown & Co.

Brand: "Richmond."

Richmond Furnace, Richmond Furnace, Mass.: 1 stack, blt. 1829, rebt. 1863, remod. 1905; 35' x 9'; 28-pipe iron stove; 2 steam blowing eng. (3,000 cfm.); 2 water-tube boilers, 150 H. P.; 2

charcoal kilns (idle). Charcoal; local ore. Company owns iron ore mine 1,500 ft. from furnace, annual cap., 12,000 tons.

Product: warm blast charcoal pig iron, annual cap., 5,000 tons. Cheshire Furnace, Cheshire, Mass.: 1 stack, blt. 1850, rebt. 1870, remod. 1906-07; 32' x 8'; iron-pipe stove; 1 steam blowing eng. (2,500 cfm.); 2 cylindrical boilers, 25 H. P. Charcoal; local (Richmond) ore. 3 charcoal kilns (idle). (Formerly owned and operated by Berkshire Iron Works; acquired by Richmond Iron Works, Oct. 1, 1908.) Product: warm blast charcoal pig iron, annual cap., 5,000 tons.

Rippel (E. G.) Steel Foundry Co., see 1908 Directory, p. 248, built crucible steel casting plant on premises leased from T. J. O'Brien. Company made a general assignment in 1908 and went out of business. Plant reverted to owner, Julia O'Brien, wife of T. J. O'Brien. Crucible furnaces were dismantled in 1911.

RIVER FURNACE COMPANY (The), Perry-Payne Bldg., Cleveland, Ohio.

Price McKinney, P.; James W. Corrigan, V. P.; J. E. Ferris, Sc. & T.; Charles E. Ash, S. Furnace Dept.; J. A. Nichols, S. Steel Works Dept.

Furnace Dept.: River Furnaces at Cleveland: 2 stacks. No. 1, blt. 1909-10, blown in May 28, 1910; No. 2, blt. 1910-11, blown in June 20, 1912; each 83' x 20' 3"; 8 McClure stoves, 95' x 22'. Conn. coke; Lake ore.

Product: malleable, basic, Bessemer and foundry pig iron, annual cap., 275,000 tons.

Company is building 2 additional stacks, to be known as No. 3 and No. 4, each 90' x 22', construction begun April 15, 1915 (No. 3 to be completed in March, No. 4 in June, 1916); annual cap., 360,000 tons; also 204 Koppers by-product coke ovens, annual cap., 750,000 tons, will probably be completed in Aug., 1916.

Steel Works Dept.: construction begun March 13, 1913; to be completed about Jan. 25, 1916; 8 B. O. H. fur. (75-ton); 1 metal mixer (1,000-ton); 23 gas producers; 2 trains (40" blooming, 21" and 18" cont. sheet bar and billet mill); plans to add rail, structural and merchant mills. Molten metal from River Furnaces. Product: ingots, sheet bars and billets, annual cap., 500,000 tons of ingots and 500,000 tons rolled products.

Riverdale Iron and Steel Co., see 1910 Supplement, p. 28, and 1912 Supplement, p. 47, built rolling mill at Riverdale, Ill., in 1908, f. o. Dec. 1, 1908. Plant was leased to Chicago-Riverdale Iron and Steel Co., Nov. 1, 1911. Closed down about Dec. 15, 1911, and not operated since. Receiver appointed in Jan., 1913, for Riverdale Iron and Steel Co. Plant purchased by Armour Steel Co. in June, 1914, is equipped with 10" merchant bar mill. *For sale or lease. Address Edwin R. Kent, 10,848 Longwood Drive, Chicago.*

RIVERSIDE STEEL CASTING CO., Passaic Ave. and Plank Road, Newark, N. J.

Inc. April 7, 1905. Capital stock: com., auth. \$100,000, issued \$33,800; pref. 8% cum. auth. \$25,000, issued \$20,200.

Thomas Malcolm, P.; John W. Ferguson, V. P.; J. Smylie Kinne, Sc. & T.; Carl S. Illig, A.

Works at Kearney, N. J.: blt. 1911, first crucible steel made Dec. 22, 1911; 2 10-pot crucible fur.; 1 A. O. H. fur. (4-ton), first O. H. steel made Dec. 11, 1911. Fuel, crude oil. (Formerly operated a plant at 451 Riverside Ave., Newark; dismantled in 1912).

Product: steel castings, and vanadium and titanium alloy steel castings for sale. Annual cap., 400 tons crucible, 1,000 tons open hearth steel castings.

ROANE IRON CO., Chattanooga, Tenn.

Org. and inc. 1867. Capital stock: \$1,000,000; bonds \$342,000.

D. P. Montague, V. P.; M. Chamberlain, Sc. & T.; at Chattanooga, Tenn. F. H. Clymer, G. S. at Rockwood, Tenn.

Selling agents: Boston, Mass., J. Brooks Fenno & Co. for New England and Eastern New York; Chicago, Cincinnati, and Cleveland, Domhoff and 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., rebld. 1901; No. 2, 80' x 17', partly erected 1893; completed and f. o. July, 1901; 8 Hugh Kennedy stoves remod. to Amsler type (3 18' x 75, 5 20' x 75'); 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 bee-hive coke ovens (150 idle) at Rockwood, annual cap. of active ovens, 85,000 net tons; 75% of ore used is mined by contractor on company property at Rockwood, 25% mined by company on own property south of Tennessee River at or near Chamberlain, Tenn., annual cap., from all ore mines, 300,000 tons. Company also owns coal property, leased to a mining company, annual cap., 200,000 tons. Iron foundry for the manufacture of general machinery castings (annual cap., 600 tons); also machine shop.

Product: foundry and forge pig iron, annual cap., 140,000 tons.

ROBESONIA IRON CO., LTD. (The), Stephen Girard Bldg., Philadelphia, Pa.

Org. and inc. April 1, 1885. Capital stock: \$300,000.

William C. Freeman, Ch.; Robert C. Lea, Sc. & T.; at Philadelphia. S. B. Patterson, S.; at Robesonia.

Selling agents: Philadelphia, Stephen Girard Bldg., Robert C. Lea & Co.

Brand: "Robesonia."

Robeson Furnace, Robeson, Pa.: 1 stack, blt. 1855, last re-blt. 1915; 80' x 18'; 4 stoves (2 McClure, 85' x 18'; 2 Roberts, 90' x 18'); 3 steam blowing eng. (34,000 cfm.); 7 water-tube boilers, 2,200 H. P. Coke; Cornwall ore. Machine shop for own use. One Greenawalt sintering pan blt. 1915; 3 projected.

Company owns mining rights at Cornwall Ore Banks, Cornwall, Pa., annual cap. of mines, 100,000 tons.

Product: low-phosphorus pig iron, annual cap., 50,000 tons.

Rochester & Pittsburgh Coal and Iron Co. own Adrian Furnace at Dubois, Pa., leased to Adrian Furnace Co.: purchased Punxy Furnace at Punxsutawney, Pa., from the Punxsutawney Iron Co., April 1, 1912, and leased it on the same day to Punxsutawney Furnace Co.

Rochester Steel Castings Co., Rochester, N. Y., see 1912 Supplement, p. 24, steel casting plant blt. 1911, dismantled.

ROCKAWAY ROLLING MILL (The), Rockaway, N. J.

Org. and inc. June, 1914. Capital stock: auth. \$100,000, issued \$22,700; bonds \$40,000.

Edward Ehlers, P., G. M., G. S. M., & P. A.; M. L. Houck, V. P.; C. C. Grovers, Sc., T. & G. S.

Rockaway Rolling Mill, Rockaway: blt. 1900-01, reblt. after fire, 1907; 3 3-d. heat. fur.; 12' 3-h. 1-st. roughing, 10' 3-h. 4-st. finishing mills. Fuel, coal. Machine shop for own use.

Product: bar iron and steel; double refined iron, and staybolt iron. Annual cap., 12,000 tons.

Rockdale Furnace, Rockdale, Tenn., see J. J. Gray, Jr.

Rockdale Iron Co., see 1908 Directory, p. 340, formerly owned Rockdale Furnace, Rockdale, Tenn. Company dissolved; incorporation papers cancelled, April 1, 1911. J. J. Gray, Jr., owner since April 1, 1911.

Rockhill Furnace Co., see 1908 Directory, p. 286, formerly leased Rockhill Furnaces, at Rockhill Furnace, Huntingdon County, Pa., gave up the lease March 1, 1910.

Rockhill Iron and Coal Co., see 1908 Directory, p. 286, owned Rockhill Furnaces, 2 alternate coke stacks at Rockhill Furnace, Huntingdon County, Pa., last active in 1908. Sold for scrap in April, 1914, and dismantled.

ROEBLING'S (John A.) SONS CO., 612 South Broad St., Trenton, N. J. Capital stock: \$15,000,000.

Charles G. Roebling, P.; Washington A. Roebling, V. P.; Ferdinand W. Roebling, Sc. & T.; Karl G. Roebling, G. S. M.; J. W. Gaskill, P. A.

Sales offices and warehouses :

Atlanta.
 Boston, 93 Pearl St.
 Chicago, 165 W. Lake St.
 Cleveland, 701 St. Clair Ave., N. E.
 Los Angeles, 216 South Alameda St.
 New York, 117 Liberty St.
 Philadelphia, 627 Market St.
 Pittsburgh, North Diamond St.
 Portland, Ore., Lumbermen's Bldg.
 San Francisco, 624 Folsom St.
 Seattle, 900 First Ave., S.

Product: iron, steel and copper rods and wire, wire strand and rope, flat wire, insulated wire and cables, wire cloth.

Kinkora Works, Roebling, N. J.: blt. 1905-06; 4 B. O. H. fur. (three 40-ton, one 30-ton); 5 A. O. H. fur. (30-ton); 5 cont. heat. fur.; 26" 3-h. 1-st. blooming mill; 3 cont. heat. fur.; 18" cont. and looping rod mill with 20 st. 18" to 11". Fuel, coal, prod. gas and oil. Heavy and fine wire drawing mills, galvanizing, tempering and annealing shops. Wire cloth and netting shops. Product: ingots, 4" billets, steel and copper rods, wire and wire cloth.

Trenton Works, Trenton, N. J.: est. 1852; 2 cont. heat. fur.; 18" modified Garrett rod mill, with 18" 3-h. 2-st. roughing and 18" to 11" 12-st. looping; this mill will be replaced later by a new one at Kinkora Works. Wire mills, galvanizing, tinning, and heat-treating departments. Product: wire rods, iron and steel wire, wire rope, wire cables, copper wire, insulated wire and cables.

Total annual capacity of the two plants; 120,000 tons ingots, (60,000 basic, 60,000 acid), 150,000 tons wire rods (rolled in part from purchased billets), 100,000 tons iron and steel wire (12,000 wire drawing blocks), 50,000,000 pounds of copper rods and copper wire.

ROGERS-BROWN IRON CO., Erie County Bank Bldg., Buffalo, N. Y.

Org. and inc. Dec. 27, 1909. Capital stock: com. \$5,000,000; pref. 7% cum. \$1,519,500; bonds, Oct. 1, 1915, \$8,907,000.

William A. Rogers, P.; Hugh Kennedy, 1 V. P. & G. M.; John D. Larkin, 2 V. P.; Harry D. Carson, Sc.; William T. Shepard, T.; David G. Williams, A.; Charles H. Byron, P. A.

Selling agents: Rogers, Brown & Co.

Brand: "Susquehanna."

Rogers-Brown Iron Co. Furnaces, Buffalo: 4 stacks, 2 thin-lined: Susquehanna Furnaces Nos. 1 and 2, each 80' x 20', blt. 1902-04; No. 1 blown in Sept. 27, 1904; No. 2, July 5, 1905; Nos. 3 and 4, each 85' x 21', blt. 1910-12; No. 3 blown in Feb. 5, 1912, and No. 4 Aug. 1, 1912; 16 Kennedy one-pass stoves, 102' x 22'; 9 steam blowing eng. (82,000 cfm.); 48 water-tube boilers, 12,000 H. P.

Coke; Lake ore. 1 Uehling double-strand casting machine; slag granulating pit, annual cap., 137,500 tons. (Nos. 1 and 2, formerly operated by Buffalo and Susquehanna Iron Co.; acquired by Rogers-Brown Iron Co., April 22, 1910.)

Product: foundry, malleable, basic, and Bessemer pig iron, annual cap., 500,000 tons.

The company owns the Susquehanna mine at Hibbing, Minn. It also 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 and Coke Co., which has 800 bee-hive ovens at Sykesville and Tyler, Pa., with an annual cap. of about 500,000 net tons.

Rome Furnace Co., see 1908 Directory, p. 343, formerly owned Rome Furnace, Rome, Ga. Furnace was leased to T. J. Deane, Jan. 20, 1908, who purchased the furnace in Nov., 1908, and formed the Silver Creek Furnace Co., to take over the property. Property was acquired by R. G. Peters, Manistee, Mich., June 1, 1909. The Michigan Trust Co., Grand Rapids, Mich., was appointed receiver for R. G. Peters, Jan. 28, 1911. Operation of furnace stopped on that date and property for sale, see Michigan Trust Co.

ROME MERCHANT IRON MILL, Rome, N. Y.

Inc. 1868.

E. M. Zehnder, P.; Lee Deutsch, Sc. & T.; Weston Jenkins, Jr., S. Brands: "Rome Superior Staybolt Iron," "Rome Perfection Engine Bolt Iron."

Rome Merchant Iron Mill, Rome, N. Y.: blt. 1868, last rebt. 1912; 14 double puddling fur.; 5 3-d. reverberatory heat. fur.; 4 trains (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 for own use.

Product: staybolt and engine bolt iron, annual cap., 25,000 tons.

ROSS-MEEHAN FOUNDRIES, Chattanooga, Tenn.

Org. Jan. 15, 1889; inc. 1889. Capital stock: \$60,000.

G. F. Meehan, P. & G. M.; R. E. L. Meehan, V. P.; P. A. Brawner, Sc. & T. Formerly called Ross-Meehan Foundry Co.

Works at Chattanooga: blt. 1889, enl. 1901 and 1914; 1 Tropenas converter (2,200-lb.), first steel made Feb. 5, 1914. Fuel, coal and coke. Machine shop for jobbing. Gray iron and malleable foundry. Adding one Tropenas converter (2-ton).

Product and annual cap.: steel castings for sale, including manganese and vanadium alloy steel castings (3,000 tons); gray iron castings (20,000), semi-steel (15,000), white iron (5,000) and malleable iron (12,000 tons.)

Rothert Process Steel Co., Leavenworth, Wash.

E. H. Rothert, P. & G. M.; E. B. Foss, Sc. & T.

Works at Leavenworth under construction; to be equipped with Rothert Process fur.; 1,100-lb. hammer; to make steel ingots for own use and for sale; high grade tool steel, lathe tools, cutlery, etc.

Rothert Steel Co., see **Shaw Crucible Steel Co.**

Round Mountain Iron and Wood Alcohol Co., see 1908 Directory, p. 350; charcoal blast furnace at Round Mountain, Ala., last active in 1906, abandoned and in ruins.

RUDGEAR-MERLE CO., 198 Bay St., San Francisco, Cal.

Org. July 1, 1910 to succeed the A. Merle Co. and the Rudgear Steel Co. Capital stock: com. \$1,000,000; pref. 7% cum. \$500,000; bonds, \$400,000.

A. Rudgear, P.; James F. Leahy, V. P.; W. A. Rudgear, Sc.; A. J. Merle, T.; F. P. Simmen, G. M.; W. M. Kreling, G. S.; W. Meussdorffer, G. S. M.; C. Merritt, P. A.

Sales offices: Los Angeles, Cal., 1548 Industrial St.; Portland, Oregon, 1186 Macadam St.

Works at San Francisco: blt. 1900; 2 heat. fur., 1 cont. rail heat. fur.; 12" 3-h. 7-st. bar mill added 1906-07; first products rolled Mar. 4, 1907. Fuel, crude oil. Machine shop for own use. One 15-ton B. O. H. fur., blt. 1906-07, dismantled 1911. (Formerly operated by the Rudgear Steel Co.; acquired by the present company July 1, 1910.)

Product: splits and rerolls old rails into angles, rounds, and squares for bedsteads, and concrete bars, annual cap., 15,000 tons.

Rudgear Steel Co., merged in **Rudgear-Merle Co.**, July 1, 1910.

RUSSELL (J. C.) SHOVEL CO. (The), Magee Bldg., Pittsburgh, Pa.

Works at Aliquippa, Pa.: blt. 1893: 3 heat. fur.; 1 train rolls.

Product: shovel blanks for own use only, annual cap., 1,700 tons.

Safety Insulated Wire and Cable Co., 114 Liberty St., New York, N. Y.
Works at New Haven, Conn.: blt. 1903; 2 A. O. H. fur. (25-ton).
Annual cap., 10,000 tons castings. *Idle and for sale.* (Formerly
owned by National Steel Foundry Co., acquired by Safety Insulated
Wire & Cable Co. Mar. 21, 1910).

St. Louis Blast Furnace Co., see 1908 Directory, p. 400, formerly owned
Missouri Furnace at South St. Louis. The property was sold
under foreclosure proceedings Nov. 26, 1912, and purchased by
the State National Bank of St. Louis, representing the bond-
holders; reported sold to Mississippi Valley Iron Co. in March, 1916.

ST. LOUIS FROG AND SWITCH CO., Chemical Bldg., St. Louis, Mo.
Org. May, 1906; inc. June 12, 1906. 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, Sc. & T.
Sales offices:

Chicago, Railway Exchange Bldg., P. & M. Co.

Denver, Majestic Bldg., Alfred Connor.

Houston, Carter Bldg., T. G. Frazee.

Los Angeles, Pacific El. Bldg., Western Eng. Sales Co.

St. Paul, Contractors Supply & Equipment Co.

Salt Lake City, Kerns Bldg., R. J. Cooper.

San Francisco, Rialto Bldg., Western Engineering Sales Co.

Works at 6500 Easton Ave., St. Louis: 2 Tropenas converters
(3-ton), blt. 1914, f. o. Oct., 1914; 2 cupolas. Fuel, coke.

Product: manganese steel and small carbon steel castings for sale;
annual cap., 3,500 tons. Make 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 and Bulwer Aves., St. Louis, Mo.
Org. 1887; inc. 1911. Capital stock: auth. \$750,000, issued
\$660,000.

E. J. Miller, P. & G. S. M.; W. S. Ashton, V. P.; George Gruene-
wald, Sc., T., & P. A.; C. P. Burgess, M.

Works at St. Louis: orig. works blt. in 1904; rolling mill added in
1914-15, first rolled products May, 1915; 4 pile fur. (2 4-d., 2 5-d.);
6 busheling fur.; squeezer; 2 forge fires; 4 trains (20" 3-h. 2-st.
muck; 14" 3-h. 2-st. roughing; 9" finishing, with 2-st. 3-h. and
2-st. 2-h.; 18" bar, with 2-st. 3-h. and 1-st. 2-h.); 1 hammer

(500-lb.). Fuel, pulverized coal. Factory for the manufacture of bolts, nuts, screws, washers, spikes, etc. Electric power.

Product and annual cap.: merchant bars, rounds and squares, $\frac{3}{8}$ " to 3", flats to 10" wide (45,000 tons); forged products (12,500 tons); spikes (10,000 kegs of 200 lb.); bolts, nuts, rivets and washers (100,000 kegs of 200 lb.); screws and special parts 10 million pieces.

St. Louis Steam Forge and Iron Works, see 1908 Directory, p. 388. Rolling mill and forge shop at East St. Louis, abandoned in 1908, not yet dismantled.

ST. LOUIS STEEL FOUNDRY CO., Wellston P. O., St. Louis, Mo. Org. 1905; inc. 1912. Owned by Curtis and Co. Manufacturing Co. G. F. Steedman, P.; J. H. Steedman, 1 V. P.; E. H. Steedman, 2 V. P.; W. C. Hecker, Sc. & T.

Steel Foundry at Wellston: blt. 1907; 2 3-ton special side-blown Bessemer converters; 2 Whiting cupolas; f. o. Aug. 15, 1907. Fuel, coal and fuel oil. Machine shop for jobbing and manufacturing. Open hearth steel furnaces abandoned.

Product: manganese, high carbon, chrome, and soft castings for sale, annual cap., from 4,000 to 5,000 tons.

Salem Charcoal Furnace Co., Dover, N. J.

Edward Kelly, P.; Augustus Munson, V. P.; John J. Howard, Sc. & T. The company converted an old iron cupola into a charcoal blast furnace, 30' x 3' 2", in 1914; first pig iron made Oct. 2, 1914; furnace dismantled in Nov., 1914. Intend to rebuild 33' x 6', with an annual cap. of about 900 tons.

Salem Iron Co. (The), formerly owned McKeefrey Furnace at Leetonia, Ohio, see Leetonia Steel Co.

SALT LAKE IRON AND STEEL CO., Salt Lake City, Utah.

Org. 1863. Capital stock: \$300,000.

O. C. Beebe, P.; David Smith, V. P.; James W. Silver, G. M.

Works at Salt Lake City: blt. 1904; 1 side blown Bessemer converter (5,000-lb.); first steel made Sept. 2, 1911; 2 cupolas; gray iron foundry. Fuel, coke.

Product: general steel castings, alloy steel castings for sale and for own use, annual cap., 3,600 tons. Also makes gray iron, brass and bronze castings. Fabricates structural steel and makes mining and milling machinery.

Sam Lanham Furnace, see State of Texas.

SAMSON IRON WORKS, Stockton, Cal.

Org. 1898; inc. July, 1902. Capital stock: \$50,000.

J. M. Kroyer, P. & G. M.; C. M. Jackson, V. P.; J. W. Kinnear, A. M. & Sc.; J. F. Hough, T.; Edward Williams, G. S.; C. H. Kroyer, G. S. M.; H. P. Cowley, P. A.

Works at Aurora and Jefferson Sts., Stockton: blt. 1902; first crucible steel, Sept. 26, 1908; 3 8-pot crucible fur. Fuel, oil. Product: small crucible castings for own use and for sale, annual cap., 700 tons. Make "Samson" sieve-grip tractors, gas and oil engines, centrifugal pumps.

Sapulpa Steel and Iron Mills, Sapulpa, Okla., see 1912 Supplement, p. 52. Works at Sapulpa, construction begun Jan. 10, 1910; work suspended July 1, 1910. Abandoned.

Schoen Steel Wheel Co. Works with special mills for rolling steel wheels at McKees Rocks, Pa., see 1908 Directory, p. 300, acquired by Carnegie Steel Co. of Pa., July 1, 1908.

Schuylkill Haven Iron and Steel Co., see 1908 Directory, p. 270, property sold to H. H. Light in July, 1913. Schuylkill Haven Rolling Mill incorporated to take over the property in April, 1914.

SCHUYLKILL HAVEN ROLLING MILL, Schuylkill Haven, Pa.

Org. and inc. 1914. Capital stock: com. auth. \$75,000, issued \$62,500.

H. H. Light, P. & T.; at Lebanon, Pa. Charles E. McInnes, V. P.; at Philadelphia, Pa.

Works at Schuylkill Haven: blt. 1873; 2 bar heat. fur.; 3 busheling fur.; 2 trains (18" 3-h. 1-st. muck, 10" 3-h. 5-st. bar.) Fuel, coal. (Formerly owned by Schuylkill Haven Iron & Steel Co.; acquired by present owners July, 1913.)

Product: merchant bar iron and steel, rounds and squares $\frac{1}{2}$ " to $2\frac{1}{2}$ ", flats $\frac{3}{4}$ " x $\frac{1}{4}$ " to 4" x 1", annual cap., 12,000 tons.

Scott Iron and Steel Co., see 1910 Supplement, p. 20; 1912 Supplement, p. 32; plant sold and now leased for other purposes than iron and steel manufacture.

SCOTTTDALE FURNACE CO., lessee, Perry-Payne Bldg., Cleveland, Ohio.

Price McKinney, P.; James W. Corrigan, V. P.; J. E. Ferris, Sc. & T.; E. P. Laughrey, S.

Selling agents: Corrigan, McKinney & Co.

Brand: "Scottdale."

Scottdale Furnace, Scottdale, Pa.: 1 stack, blt. 1872-73; last rebt. 1911, 75'3" x 19'3"; 1 Oldman stove, 85' x 21'; 3 Foote fire brick stoves, 75' x 19'. Conn. coke; Lake ore. (Owned by the United States Cast Iron Pipe & Foundry Co.)

Product: Bessemer, malleable, forge, and foundry pig iron, annual cap., 110,000 tons.

SCRANTON BOLT AND NUT CO., Scranton, Pa.

Org. and inc. May, 1899. Capital stock: \$500,000.

E. M. Zehnder, P.; L. M. Horton, Sc. & T.; J. W. Leverich,

G. S.; C. E. Broadhead, S. M.; at Scranton. C. H. Zehnder V. P.; at 90 West St., New York.

Brand: "Diamond Z."

Works at Scranton: blt. 1899, enl. 1905; 7 double puddling fur.; 6 3-d. heat. fur.; squeezer; 5 trains (20" 3-h. 2-st. muck, 18" 3-h. 2-st. bar, 12" 3-h. 5-st. guide, 10" with 14" 3-h. 1-st. and 10" 3-h. 5-st., 16" 2-h. 1-st. universal mill used for bars up to 10" wide); 6 spike mach. 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.

Org. and inc. July 7, 1899. Capital stock: \$1,500,000; bonds \$891,000. Formerly called Scullin-Gallagher Iron and Steel Co., corporate title changed July 1, 1915.

Harry Scullin, P. & G. M.; G. L. L. Davis, V. P.; V. C. Turner, Sc. & T.; W. T. Hays, G. S.; L. L. Middleton, P. A.; at St. Louis. F. L. Norton, V. P.; at New York.

Sales offices:

Chicago, McCormick Bldg., Ross Wortham & Co.

New York, Grand Central Terminal.

St. Paul, Pioneer Press Bldg., B. W. Parsons.

Seattle, White Bldg., H. H. Peck.

Works at St. Louis: 8 B. O. H. fur. (25-ton). Fuel, oil. (2 Bessemer converters (4-ton), blt. 1906, dismantled and sold.)

Product: steel castings for sale, bolsters and truck sides, annual cap., 100,000 tons.

SEABOARD STEEL CASTING CO., Chester, Pa.

Org. and inc., 1900. Capital stock: com. auth. \$750,000, issued \$726,500.

Wm. C. Sproul, P.; D. G. Stokes, T. & P. A.; S. E. Sproul, G. M.; E. J. Birtwell, G. S.; at Chester. Joseph W. Cochran, Jr., Sc.; at Williamsport, Pa.

Selling agents: New York, 81 Fulton St., Charles Hubbard & Co.; Philadelphia, Crozer Bldg., A. R. Brunner & Co.

Brand: "Seaboard."

Works at foot of Jeffrey St., Delaware River, Chester: blt. 1900, f. o. Dec. 29, 1900; 3 A. O. H. fur. (1 25-ton, 2 20-ton). Fuel, producer gas. Machine shop for own use.

Product: acid open hearth and vanadium steel castings for sale for locomotives, shipbuilding and general machinery purposes; annual cap., 16,000 tons.

Seamless Tube Co. of America succeeded by Pittsburgh Steel Products Co.

Seattle Steel Co., see 1908 Directory, p. 404, works at Youngstown, Wash., acquired by the Pacific Coast Steel Co., Jan. 1, 1911.

Security Construction and Engineering Co., see 1908 Directory, p. 235, abandoned project for steel casting plant at South Boston.

SEIDEL BROTHERS, Marysville, Pa.

Perry Forge at Marysville: blt. 1862; 7 forge fires; 1 hammer. Charcoal pits, annual cap., 60,000 bushels.

Product: charcoal blooms, billets and slabs for boiler tubes from scrap, annual cap., d. t., 4,000 tons.

SEIDEL, H. C., (owner), Lorane, Pa.

Exeter Steam Forge, Lorane: blt. 1868, rebt. 1894; 1 heat. fur.; 1 ham. (2,000-lb.). Fuel, bit. coal.

Product: bars and forgings from charcoal blooms and wrought iron scrap, annual cap., 500 tons.

SELLERS MANUFACTURING CO., 4651 Malcolm Ave., (Irving Park, P. O.), Chicago, Ill.

Inc. April 24, 1895. Capital stock: issued, com. \$300,000; 1st. pref. cum. \$200,000; 2nd. pref. cum. \$150,000.

John M. Sellers, P. & G. S. M.; T. F. Geraghty, 1 V. P.; J. C. Duranceau, 2 V. P. & G. M.; E. M. Kerwin, Sc., T., & P. A.; F. Knaus, G. S.

Works at Mayfair, Chicago: blt. 1907; 4 rotary (special type) busheling and puddling fur.; 4 heat. fur. (1 3-d. 3 4-d.); 2 trains (22" 3-h. 3-st. bar, 22" 3-h. 1-st. bar); one double frame ham., 6,000-lb. Fuel, coal. Machine shop for own use. Finishing dept. for shearing, punching, etc., tie plates, angle bars, etc.

Chicago Ave. Works formerly operated by this company dismantled in 1908.

Product: iron tie plates, angle bars, switch slide plates and merchant iron, annual cap., 45,000 tons.

SENECA IRON AND STEEL CO., Erie County Savings Bank Bldg., Buffalo, N. Y.

Org. and inc., Nov. 7, 1906. Capital stock: \$750,000.

James S. Patterson, P.; Hugh Kennedy, V. P.; H. M. VanHorn, Sc.; Alexander Paterson, T. & G. M.

Works at Blasdell, Erie Co., N. Y.: blt. 1907, f. o. Oct. 7, 1907; 5 pair, 5 sheet fur.; 11 hot sheet mills, 26" and 28" dia.; 5 cold sheet mills, 24"; 8 double box annealing fur.; 2 pickling mach.; 3 galvanizing pots (annual cap., 17,000 tons). Fuel, coal and producer gas. Erecting 3 additional hot mills.

Product: black and galvanized sheets, flat and corrugated, all forms of roofing and siding; annual cap., 30,000 tons.

Seyfert, Samuel R., and Brother, Reading, Pa., (owners.) Seyfert Rolling Mill at Seyfert Station, Reading: blt. 1880-81; 9 double

puddling fur.; 4 heat. fur.; squeezer; 2 trains (22" 2-st. muck, 22" x 66" plate and skelp); 1 ham. (4-ton). Fuel, bit. coal.
 Product and annual cap.: puddled bar (10,000 tons) and skelp (15,000 tons). *Idle for many years but not dismantled.*

Seyfert, Simon, Estate of, see 1908 Directory, p. 268, owned Gibraltar Iron Works at Reading, Pa. Forge burned down in 1909 and was dismantled in 1910. Rolling mill dismantled in 1914.

SEYFERT, SIMON, ESTATE OF, Blandon, Pa.

Blandon Rolling Mill: blt. 1867, since enl.; 1 single, 6 double puddling fur.; 4 4-d. heat. fur.; squeezer; 2 trains (11" 3-h. 3-st. skelp, 8" 3-h. 3-st. skelp). Fuel, bit. coal.

Product: iron grooved pipe skelp, annual cap., 20,000 tons.

SHARON FOUNDRY CO., Sharon, Pa.

Org. and inc., March, 1902. Capital stock: auth. \$250,000, issued \$231,000.

W. W. Shilling, P. & G. M.; Thomas Kennedy, G. S., Sc. & T.; Wm M. McIntyre, G. S. M.

Works at Wheatland, Mercer County, Pa.: blt. 1903; 2 A. O. H. fur. (20-ton); 2 Laughlin gas prod.; first steel made, Dec. 18, 1905. Fuel, oil.

Product: steel castings for sale, annual cap., 8,400 tons.

SHARON STEEL HOOP CO., Sharon, Pa.

Org. and inc. Oct. 8, 1900. Capital stock: \$2,500,000.

Severn P. Ker, P.; George W. Short, V. P. & G. S.; J. Reid Evans, Sc. & T.; Everett A. Thatcher, G.S.M.; A. D. Troth, P.A.

Selling agents:

Chicago, McCormick Bldg., H. T. Gilbert.

Cincinnati, Second Nat'l Bank Bldg., L. A. Burrell.

New Orleans, Wm. B. Bloomfield.

New York, 17 Battery Pl., Edward Caterson.

Philadelphia, Harrison Bldg., The Crowther Co.

Portland, Ore., H. A. Heppner Co.

St. Louis, Security Bldg., E. R. Hensel Steel & Copper Co.

San Francisco, Monadnock Bldg., J. W. Richards.

Works at Sharon: blt. 1900-01, f. o. March 15, 1901; 3 Swindell stationary A. O. H. fur. (35-ton); 3 Swindell stationary B. O. H. fur. (35-ton); first acid steel made, Apr. 24, 1903; first basic steel, Feb. 8, 1905. Annual cap., 140,000 tons ingots for own use, (70,000 tons acid, 70,000 tons basic).

8 regenerative heat. fur. (6 5-d.; 2 6-d.); 2 cont. heat. fur. (1 Laughlin, 1 Morgan); 7 trains (22" 3-h. 1-st. blooming; 14" 3-h. 2-st.; 12" 3-h. 3-st. billet; 14" 3-h. 8-st.; 10" 3-h. 9-st.; and 9" 3-h. 9 st. comb. finishing; 8" 3-h. 5-st. finishing). Fuel, prod. gas, oil and bit. coal. Galvanizing plant with 2 pots for galvanizing hoops, bands and strips. Machine shop for own use.

Product: billets, sheet bars, hoops, bands and cotton ties. Annual cap., 144,000 tons billets and sheet bars, 160,000 net tons hoops, bands, and cotton ties.

SHARPSVILLE FURNACE CO. (The), 2514 Oliver Bldg., Pittsburgh, Pa.

Org. and inc., May, 1906. Capital stock: com. \$100,000; pref. 6% cum. auth. \$100,000, none issued; bonds \$150,000.

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'; 3 stoves; 3 steam blowing eng. (21,000 cfm.); 5 water-tube boilers, 1,500 H. P. Slag granulating pit, 25,000 tons. Coke; Lake ore.

Product: Bessemer, malleable and foundry pig iron, annual cap., 60,000 tons.

Shaw Crucible Steel Co., Hoquiam, Wash. Works at Hoquiam, see 1908 Directory, p. 404, acquired by Rothert Steel Co. in 1908; in 1909 the Rothert Steel Co. was acquired by the Washington Steel and Iron Co.

SHAWINIGAN ELECTRO PRODUCTS CO. (The), U. S. Fidelity and Guaranty Bldg., Baltimore, Md.

Org. and inc., May 11, 1915. Capital stock: auth. \$250,000, issued \$15,300.

Charles E. F. Clarke, P.; at 24 Exchange Pl., New York. J. A. Walls, V. P.; James L. Rintoul, Sc., T., & A.; P. H. Falter, G. M.; J. E. O'Connor, P. A.; at Baltimore.

Works at Highlandtown, Md.: construction begun Aug. 14, 1915; one electric furnace for the manufacture of ferro-silicon; first ferro-silicon made Dec. 23, 1915; installing a second electric furnace. Hydro-electric power from Susquehanna plant of Pennsylvania Water and Power Co.

SHEFFIELD COAL AND IRON CO., 71 Broadway, New York, N. Y.

Org. and inc. Feb., 1909. Capital stock: com. auth. and issued, \$2,500,000; pref. auth. \$750,000, issued \$635,161.35; bonds \$614,550. James Gayley, P.; J. R. Floyd, V. P. & T.; Walter S. Reed, Sc.; John S. Levis, A. Sc. & A. T.

Sheffield Furnaces, Sheffield, Ala.; 3 stacks, each 75' x 18', blt. 1887-88, all remod. 1903, No. 2 rebt. 1906; 12 Whitwell-Cowper stoves (6 90' x 23' and 6 70' x 19'); 6 steam blowing eng. (8,493 cfm.); 11 water-tube boilers, 4,300 H. P. Stonegap coke; local brown hematite ore. Machine shop for own use. *Last active in 1910.*

Product: foundry and forge pig iron, annual cap., 210,000 tons.

The company owns iron ore mines at Russellville, Ala., and West Point, Tenn., annual cap., 120,000 tons; 225 bee-hive coke ovens at Jasper, Ala., annual cap., 200,000 net tons.

Sheffield Rolling Mill Co., see 1908 Directory, p. 352, went into bankruptcy in 1908. The North Alabama Rolling Mill Co. was organized and took over the plant, August 7, 1909.

SHELBY IRON CO., Shelby, Ala.

Org. and inc. 1890. Capital stock: \$1,000,000.

M. W. Bush, P.; at Birmingham, Ala. W. W. Jacobs, V. P.; at Hartford, Conn. B. Y. Frost, Sc. & T.; at 80 Broadway, New York. J. G. Hendrick, A. T.; B. F. Wilson, Jr., S.; at Shelby, Ala.

Selling agents: Birmingham, Ala., Hammond-Byrd Iron Co.; New York, 16 Exchange Place, Alley & Page; Pittsburgh, Hickman, Williams & Co.

Brand: "Shelby."

Shelby Furnaces, Shelby, Ala.: 2 stacks, No. 1, blt. 1863, rebt. 1899, 60' x 14'; No. 2, blt. 1873, 60' x 14'; 6 iron pipe stoves, 18' x 12'; 3 steam blowing eng. (30,000 cfm.); 5 water-tube boilers, 1,200 H. P. Charcoal; local brown hematite ore. Foundry and machine shop for own use.

The company owns iron ore mine at Shelby; annual cap., 60,000 tons; also 49 charcoal kilns at various points in Alabama; annual cap., 2,100,000 bushels.

Product: warm-blast charcoal pig iron, annual cap., 50,000 tons.

SHELBY STEEL TUBE CO., Frick Bldg., Pittsburgh, Pa.

Org. and inc. Feb. 8, 1900.

Subsidiary of the United States Steel Corporation.

Wm. B. Schiller, P.; Edward Worcester, 1 V. P.; J. H. Nicholson, 2 V. P.; B. C. Moise, Sc. & A.; G. E. Benson, T.; John J. Kennedy, G. M. S.; D. H. Ramsbottom, A. G. M. S.; S. M. Lynch, P. A.; J. J. Dunn, G. S.; John W. McKee, A. T.; C. B. Foster, A. S.

Selling agents: National Tube Co., Pittsburgh, Pa.

Product: seamless steel tubes.

Standard Works at Ellwood City, Pa. Mill "A": blt. 1898, enl. 1907; 2 cont. heat. fur.; 20" 3-h. 3-st. bar mill; 3 hot mill units for seamless tubes, each consisting of a piercing, and rolling mill (22" 2-h. 1-st.), reeling and sizing machines with 3 heating fur.; 1 hand mill unit, 14" 2-h. 2-st. rolls with heat. fur.; cold drawing equipment. Mill "B": blt. 1895; f. o. June, 1895; 2 heat. fur.; 1 piercing mill, 1 cont. rolling mill (12" 2-h. 5 st.). Cold drawing equipment. Fuel, bit. coal and prod. gas. Machine shop for own use. Annual cap., 85,000 tons seamless tube blanks, 60,000 tons of hot finished and cold drawn seamless steel tubes, 250 tons gray iron castings.

Adding a continuous bar mill, annual cap., 165,000 tons; 2 piercing mill's with auxiliary rolling mills and heating furnaces, annual cap., 62,000 tons finished seamless tubes.

SHENANDOAH IRON AND COAL CO., 13th and Chestnut Sts., Philadelphia, Pa.

Org. and inc. Jan. 30, 1905. Capital stock: \$100,000.

J. T. Jackson, P.; A. T. Yarnall, Sc. & T.; at Philadelphia.
F. E. Searle, V. P.; at New York.

Liberty Furnace at Liberty Furnace, Va.: 1 stack, blt. 1890-91, remod. 1903, 55' x 11'; Durham stove. Charcoal; local brown hematite. *Last active in 1906.*

Charcoal pits connected with the furnace. Company owns iron ore mines near furnace, also 3-ft. gauge railroad, furnace to Edinburg, 12 miles.

Product: charcoal pig iron, annual cap., 25,000 tons.

SHENANGO FURNACE CO. (The), Oliver Bldg., Pittsburgh, Pa.

Inc. Jan. 23, 1906. Capital stock: \$5,000,000; bonds \$3,312,000.

W. P. Snyder, P.; C. D. Dyer, V. P.; W. P. Snyder, Jr., A. P.; H. M. Wilson, Sc.; Henry Irwin, Jr., T.; at Pittsburgh.
E. J. Maney, Manager Mines; at Duluth, Minn. G. L. Collord, Manager Furnaces; at Sharpsville, Pa. A. K. Renwick, Supt. Coke Works; at Wilpen, Pa.

Selling agents: W. P. Snyder & Co., Pittsburgh.

Brand: "Shenango."

Products: Pig iron, iron ore, coal and coke.

Shenango Furnaces, Sharpsville, Pa.: 3 stacks. No. 1 (new) blt. 1906, rebt. 1914, blown in Aug., 1914, 88' x 20'; 4 McClure stoves, 85' x 20'. No. 3, blt. 1895, rebt. 1911, 76' x 18' 6"; 4 McClure stoves, 85' x 19' 6". No. 4 acquired in 1905, blt. 1872, last rebt. 1906, 75' x 15' 6", 4 Pollock iron-pipe stoves. 1 Uehling casting machine; 3 slag granulating pits for slag ballast, annual cap., 200,000 tons; 10 steam blowing eng. (140,000 cfm.); 19 water-tube boilers, 7,000 H. P. Gray iron foundry; machine shop for own use. Conn. coke; Lake ore. Old No. 1 Furnace and No. 2 Furnace dismantled, 1908. Product: Bessemer, basic and malleable pig iron for sale; annual cap., 325,000 tons.

Iron ore properties: On the Mesabi Range, owns the lease of the Shenango, Webb and Whiteside mines, annual cap., 2,000,000 tons; also the South Tener and Tioga mines as reserves. On the Menominee Range, owns one-half interest in the Antoine Ore Co., which operates the Clifford, Traders, Cornell, Vulcan, Silicon, and Keel Ridge mines. On the Cuyuna Range, owns in fee 680 acres undeveloped ore lands.

Steamship properties: Owns the Shenango Steamship and Transportation Co. Steamers, "Shenango," 11,500 tons; "Col. J. M. Schoonmaker," 13,000 tons; "Wm. P. Snyder, Jr.," 13,000 tons. Associated interests own the stock of The Shenango Steamship Co. Steamers, "W. P. Snyder," 10,000 tons; "Wilpen," 11,000 tons.

Coal and coke properties: Owns 800 acres of coal lands at Wilpen,

Westmoreland County, Pa. Annual cap. of Wilpen mine, 225,000 tons. Also 200 bee-hive coke ovens at Wilpen, annual cap., 120,000 net tons.

Limestone: Owns interest in capital stock of the Lake Erie Limestone Co. with quarries at Lowellville, Ohio, annual cap., 200,000 tons.

Shenango Iron and Steel Co., see 1908 Directory, p. 307. Receiver appointed in 1908. Property sold Dec. 21, 1910, to John B. Finley, representing the creditors. Purchased from the committee in Oct., 1911, by Max Solomon, Pittsburgh, Pa.; partly dismantled.

Shull Steel Castings and Manufacturing Co., see 1908 Directory, p. 374, corporate title changed to The Canton Steel Foundry Co., Jan. 1, 1912.

Silver Creek Furnace Co., see Rome Furnace Co.

SIMONDS MANUFACTURING CO., 35 North St., Fitchburg, Mass.

Org. and inc. 1868. Capital stock: \$2,000,000, issued \$1,800,000. Alvan T. Simonds, P.; Thomas F. Howarth, V. P. & A.; Gifford K. Simonds, T. & G. M.; John E. Kelley, Sec. & G. S. M.; at Fitchburg. Charles F. Braffett, V. P.; at Chicago. Henry A. Sargent, V. P.; at Portland, Ore.

Sales offices in the large cities.

Product: saw plate, saws, machine knives, files, etc.

Operates plants at Fitchburg, Mass., Chicago, Ill., Lockport, N. Y., and Montreal, P. Q. Steel and rolled products made only at Lockport.

Lockport Works, Lockport, N. Y.: blt. 1910-11, using machinery from Chicago plant dismantled, 1910; 3 30-pot crucible fur.; 2 electric fur. (one 1½-ton special, one 5½-ton Heroult); first crucible steel made Jan. 7, 1911; first electric steel made Sept. 7, 1911; 2 4-d. billet heat. fur., 6 3-d. sheet reheatt. fur.; one forge fire; 5 sheet mills (24" x 54" roughing; 24" x 72" circular saw finishing mill; 22" band saw mill with 1-st. 3-h. roughing, 1-st. edging, 1-st. 3-h. and 1-st. 2-h. finishing; 20" hand saw mill with 1 st. 3-h. and 1-st. 2-h.; 18" 2-h. 2-st. cross-cut mill); first rolled products made Jan. 2, 1911. Installing 16" to 10" bar mill with 16" 3-h. 3-st. and 10" 3-h. 5-st. Fuel, producer gas. Product: saw plates for own use and crucible and open hearth sheets for sale. Annual cap., 7,500 tons crucible, 500 tons electric ingots; 3,100 tons of rolled products.

Sims-Kent Works, see 1908 Directory, p. 255. Plant sold to Lackawanna Foundries, March 31, 1908, for use as a gray iron foundry. Subsequently leased to United States Aluminum Co.

SINGER MANUFACTURING CO., Elizabeth, N. J.

Works at Elizabethport: blt. 1903; heat. fur.; hot and cold trains;

annealing fur.; wire drawing blocks. Product: rounds, flats, etc. for own use only; estimated annual cap., 15,000 tons.

Sinnemahoning Iron and Coal Co. own Emporium Furnace, Emporium, Pa., leased to the Emporium Iron Co.

SIVYER STEEL CASTING CO., Milwaukee, Wis.

Org. and inc. Jan., 1909. Capital stock: auth. \$100,000, issued, \$55,000.

F. L. Sivyver, P.; C. R. Messinger, 1 V. P.; Donald Fraser, 2 V. P.; Wm. C. Frye, Sc. & T.; Wm. J. Nugent, G. S.

Selling agents: Indianapolis, 1215 Fletcher Trust Bldg., E. W. Levering; Saint Paul, Pioneer Bldg., S. J. Pfaff; Salt Lake City, 320 Kearns Bldg., The C. H. Jones Co.

(Formerly operated crucible steel plant, Park St., Milwaukee, blt. 1909, dismantled in 1910, machinery used to partly equip 37th Ave. Works.)

Works at 37th Ave. and Mitchell St., Milwaukee: blt. 1910, first steel made April 3, 1910; 3 6-pot crucible fur.; 1 Tropenas converter (1-ton), blt. 1912, f. o. Jan. 6, 1913. Installing one 3,500-lb. electric furnace, construction begun Dec. 8, 1915, annual cap., 4,000 tons.

Product: steel castings for sale for automobiles and general machinery purposes, vanadium and nickel steel castings. Annual cap., 1,000 tons of crucible, 2,000 tons of converter, and 4,000 tons electric steel castings.

Sizer Forge Co., see 1908 Directory, p. 243, do not make charcoal blooms.

SKAGIT STEEL AND IRON WORKS, Sedro-Woolley, Wash.

Org. and inc., Nov. 1, 1914. Capital stock: \$15,000.

F. R. Faller, P. & G. M.; Frank Fritsch, V. P.; F. E. Powell, Sc. & T.

Works at Sedro-Woolley, Wash.: blt. 1913; 1 Tropenas converter (1-ton); 1 cupola; first steel made June 14, 1913. Fuel, oil. Machine shop for jobbing. Gray iron foundry.

Product: steel castings for sale for machinery purposes, annual cap., 1,500 tons. Gray iron castings, annual cap., 2,500 tons.

Slatington Rolling Mill Co., see 1908 Directory, p. 262, rolling mill at Slatington acquired by the Slatington Rolling Mills (inc., July 6, 1911) on Aug. 11, 1911. Placed in the hands of Oscar A. Neff, trustee for the bondholders in 1915 and sold Dec. 24, 1915, to Edwin German, Slatington, Pa.

SLIGO FURNACE CO., 915 Olive St., St. Louis, Mo.

J. M. Buick, P. & G. M.; S. S. DeLano, T.; N. A. Doyle, Sc. & A.; W. E. Hedgcock, P. A.

Sligo Furnace at Sligo, Mo.: 1 stack, blt. 1880, rebt. 1891; Foote hot-blast stoves. Charcoal; local ore. Company owns iron ore mines near furnace; also charcoal kilns, annual cap., 2,160,000 bu.

Product: charcoal pig iron, foundry, car wheel, malleable and basic; annual cap., 20,000 tons.

Sligo Iron and Steel Co., see 1908 Directory, p. 317, placed in hands of receiver July 14, 1914, and was sold by the trustee in bankruptcy Feb. 15, 1915, to H. L. Robinson, Uniontown, Pa., representing Charles Davidson of Connellsville, Pa.; sold to Sligo Steel Co.

SLIGO STEEL CO., Connellsville, Pa.

Acquired plant formerly owned by Sligo Iron & Steel Co., Feb. 1, 1916, see Charles Davidson.

SLOSS-SHEFFIELD STEEL AND IRON CO., Birmingham, Ala.

Org. and inc., 1899. Capital stock: com. auth. and issued \$10,000,000; pref. 7% non-cum. auth. \$10,000,000, issued \$6,700,000; bonds \$4,000,000.

Registrar: Lawyers Title Insurance & Trust Co., 160 Broadway, New York.

J. C. Maben, P.; at 74 Broadway, New York. J. W. McQueen, V. P. & G. S. M.; J. C. Maben, Jr., V. P.; E. L. Morris, Sc. & T.; Hugh Franklin, A.; W. B. Dowell, P. A.; at Birmingham.

Selling agents:

Birmingham, American Trust Bldg., J. W. McQueen.

Birmingham, H. Tutwiler.

Boston, 84 State St., William J. Breen.

Chicago, 804 The Rookery, David Evans.

Cincinnati, The Domhoff & Joyce Co.

El Paso, Texas, 511 Guaranty Trust Bldg., Darbyshire & Evans.

Los Angeles, Cal., 214 Wilcox Bldg., Spreckles Bros. Commercial Co.

New York, 56 Liberty St., Debevoise-Anderson Co.

Philadelphia, 2025 Land Title Bldg., F. D. Dimmick.

Portland, Ore., 431 Railway Exchange Bldg., W. H. Williams & Co.

St. Louis, 1113 Central Nat'l Bank Bldg., J. B. Fisher.

San Francisco, Ralph Mills & Co.

Glasgow, Scotland, 19 St. Vincent Place, Wm. Jacks & Co.

Brands: "Sloss," "Noala."

Product: foundry and forge pig iron.

Sloss Furnaces: 4 stacks, Nos. 1 and 2 at Birmingham, Nos. 3 and 4 at North Birmingham. No. 1, blt. 1881-82, last rebt. 1913-14, 82' 6" x 18'; No. 2, blt. 1882, last rebt. 1906, 82' 6" x 18'; No. 3, blt. 1887-88, rebt. 1901, 73' x 17' 6"; No. 4, blt. 1887-89, rebt. 1907, 82' 6" x 17' 6"; 18 Whitwell and 3 Gordon-Whitwell-Cowper stoves; 13 steam blowing eng. (202,344 cfm.); 38 boilers (20 water-tube, 18 tubular) 9,150 H. P. Coke; local red and brown hematite ore. Product: foundry and forge pig iron, annual cap., 360,000 tons.

Philadelphia Furnace, Florence, Ala.: 1 stack; blt. 1887-91, last rebt. 1906, 75' x 17'; 5 Whitwell stoves, 70' x 20', 4 steam blowing

eng. (62,598 cfm.); 6 water-tube boilers, 1,625 H. P. Coke; Russellville brown ore. Product: foundry and forge pig iron, annual cap., 85,000 tons.

Hattie Ensley Furnace, Sheffield, Ala.: 1 stack, blt. 1887, rebt. 1903, 75' x 17'; 5 4-pass Whitwell stoves, (three 65' x 18', two 70' x 20'); 3 steam blowing eng. (41,046 cfm.); 9 water-tube boilers, 1,965 H. P. Coke; local brown hematite. Product: foundry and forge pig iron, annual cap., 85,000 tons. Building one additional stack, 81' x 17'6", annual cap., 98,500 tons, to be completed about Aug. 1, 1916.

Lady Ensley Furnace, Sheffield, Ala.: 1 stack, blt. 1887-89, last rebt. 1906, 75' x 17'; 5 Whitwell stoves; 2 Dixon (old) steam blowing eng.; 7 water-tube (old) boilers, 1,465 H. P. Furnace practically dismantled in 1913-14.

Total annual cap. of blast furnaces, exclusive of Lady Ensley Furnace and furnace building, 530,000 tons.

IRON ORE LANDS, COAL LANDS, COKE OVENS, ETC.

In April, 1900, the Sloss-Sheffield Steel & Iron Company purchased the four blast furnaces of the Sloss Iron & Steel Company located at Birmingham and North Birmingham, 951 coke ovens, of which 288 were located at the City Furnace, Birmingham, 214 at Coalburg, 99 at Brookside and 350 at Blossburg. Since then the Sloss-Sheffield Steel & Iron Company has built 200 coke ovens at Flat Top and 87 ovens at New Found (Brookside), making a total of 1,238 ovens. Also owns 200 coke ovens at Ivy, see below.

The Sloss-Sheffield Steel & Iron Company owns all of the stock of the North Alabama Furnace Company of Sheffield, which formerly operated the Lady Ensley Furnace. It also owns all of the stock of the Lady Ensley Coal, Iron & Railroad Company, including 200 bee-hive coke ovens at Ivy.

The Sloss-Sheffield Steel & Iron Company owns 8,407 acres of red fossiliferous ore lands in Etowah, 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, Etowah, Fayette, Jefferson, Marion and Walker Counties.

The Sloss-Sheffield Steel & Iron Company in addition to operating two furnaces at Birmingham, two at North Birmingham, one at Sheffield and one at Florence, operates red ore mines at Irondale and Sloss in Jefferson County, with an annual capacity of 455,000 tons of ore, and at Russellville, Franklin County, with an annual capacity of 350,000 tons of brown ore. They also operate coke ovens at Brookside, New Found, Blossburg, Flat Top and Ivy, with an annual capacity of 475,000 tons of coke. They operate coal mines at Brookside, Cardiff, Blossburg, Flat Top, Bessie, Ivy and Drifton, with an annual capacity of 1,500,000 tons.

SMITH (GEORGE H.) STEEL CASTING CO., 500 Clinton St., Milwaukee, Wis.

Org. and inc. Oct. 15, 1901. Capital stock: \$50,000.

E. P. Smith, P.; Charles Pfeiffer, V. P.; F. E. Hinnners, Sc. & T.

Selling agent: Chicago, 1657 Conway Bldg., J. B. Marshall.

Works at Milwaukee: blt. 1897; last rebt. 1904; 3 modified Tropenas converters (2-ton); 2 4-pot crucible furnaces for melting final mixtures. Fuel, coke and oil.

Product: steel castings for sale for general and electrical machinery, automobiles, etc.; alloy steel castings, nickel, chrome, vanadium, manganese, etc.; annual cap., 6,000 tons.

Snyder Electric Furnace Co., Monadnock Bldg., Chicago; one small electric fur.

Solid Steel Casting Co., see 1908 Directory, p. 274. Company placed in hands of receiver, May 4, 1909. Plant sold at receiver's sale Nov. 9, 1909, but sale not confirmed by court. Again sold by receiver, Jan. 11, 1910, to Burrows Sloan of Philadelphia. Machinery and equipment sold and plant dismantled in 1912.

Solomon (Max), owner, Oliver Bldg., Pittsburgh, Pa.

Rolling Mill at Wheatland, Pa.: blt. 1872, rebt. 1906; 15 single puddling fur.; 2 pile fur.; 5 2-d. heat. fur.; squeezer; 3 trains (21" 3-h. 2-st. muck, 10" 3-h. 5-st. with 14" 3-h. 1-st. roughing and 10" 3-h. 4-st. finishing, 18" 3-h. 3-st. finishing). Annual cap., 25,000 tons muck bar, 40,000 tons bar iron. (Formerly owned by Shenango Iron and Steel Co.; acquired by present owner, Oct., 1911.) *Machinery, etc., for sale; plant being dismantled.*

SOUTHERN CALIFORNIA IRON AND STEEL CO., 4th and Mateo Sts., Los Angeles, Cal.

Org. and inc. Nov. 25, 1901. Formerly called California Industrial Co.; corporate title changed as above April, 1914. Capital stock: auth. \$1,500,000, issued \$475,000; bonds \$150,000.

W. L. Stewart, P.; A. C. Denman, Jr., V. P. & G. M.; A. W. Grier, Sc.; S. K. Rindge, T.; G. B. Stephens, S.; G. H. Pettengill, P. A.

Works at 4th and Mateo Sts., Los Angeles: blt. 1893-94; 1 B.O. H. fur. (15-ton) blt. 1914, first steel made April 10, 1915; building 1 B. O. H. (30-ton) annual cap. 20,000 tons; 2 heat. fur. (1 4-d., 1 5-d.); 2 trains (20" 3-h. 3-st. bar, 14" 3-h. 1-st. roughing and 9" 3-h. 5-st. merchant mill). Fuel, oil. Bolt and nut factory, blt. 1906; make bolts $\frac{3}{8}$ " to 3" dia., nuts $\frac{3}{8}$ " to 2", rivets $\frac{1}{2}$ " to 1".

Product: steel ingots for own use, annual cap., 10,000 tons; merchant bar steel, annual cap., 15,000 tons. Bolts and nuts.

Southern Car Wheel Iron Co., see 1908 Directory, p. 344. Company became bankrupt. Tallapoosa Furnace was sold by trustee in

bankruptcy in Jan., 1910, to W. H. Patterson, acting for the bondholders. Purchased in April, 1913, by J. M. Garvin who formed the Blue Ridge Iron Co. in August, 1913, to take over the property.

SOUTHERN IRON AND COMMISSION CO. (lessee), Birmingham, Ala.

Org. 1909; inc. 1911. Capital stock: \$2,000.

R. C. Foster, P. & G. M.; W. G. Winburn, V. P. & Sc.

Eclipse Rolling Mill, East Birmingham, Ala.: blt. 1904; 2 2-d. heat. fur.; 8" guide mill with 2-st. 3-h. and 2-st. 2-h. Fuel, coal and coke. (Owned by W. C. Shackelford; leased by Southern Iron and Commission Co. Oct. 1, 1909.)

Product: merchant bar iron, annual cap., 6,000 tons.

Southern Iron and Steel Co., see Southern Steel Co., and Gulf States Steel Co.

SOUTHERN PACIFIC CO., San Francisco, Cal.

T. W. Younger, Superintendent Motive Power.

Rolling Mill at Sacramento, Cal.: blt. 1881; 14 reverberatory fur. (6 2-d., 8 3-d.); 4 trains (two 18" 3-h. 3-st., two 12" 3-h. 3-st. bar mills); 8 ham. Fuel, oil. Machine shop for own use. Gray iron foundry (13,000 tons). Bolt and spike department.

Product: merchant bar iron and shapes, beams, angles and channels; annual cap., 25,800 tons rolled and 4,000 tons forged products.

Southern Steel Casting Co., see 1910 Supplement, p. 23, electric steel casting plant not built.

Southern Steel Co., see 1908 Directory, pp. 200-202, became involved in the panic of 1907 and went into the hands of a receiver in Oct., 1907. In March, 1908, the properties were turned over to trustees in bankruptcy representing the creditors. The properties were sold at public auction April 12, 1909, and bid in by the reorganization committee for \$5,111,000. The Southern Iron and Steel Co., inc. in New Jersey, Mar. 15, 1909, with a capital stock of \$17,000,000 (\$7,000,000 6% non-cum. pref. and \$10,000,000 com.) was formed to take over the properties. The transfer was made by deed dated April 20, 1909. In 1911 plans were completed for a merger of the Southern Iron and Steel Co. and the Alabama Consolidated Coal and Iron Co. but the project was not accepted by the foreign bondholders. In 1911 the company defaulted in the payment of interest on the underlying bonds and the Chattanooga, Rising Fawn, and Trussville furnaces, iron ore, coal and limestone properties covered by the several mortgages were taken over by the bondholders. See under Georgia Steel Co., Chattanooga Iron & Coal Corp., Michigan Trust Co.

The Southern Iron and Steel Co. was declared bankrupt Aug. 1, 1912, James Bowron being appointed sole receiver. The proper-

ties were sold at public auction Jan. 31, 1913, and bid in for \$1,530,000. The properties were taken over by the Standard Steel Co., a temporary corporation with nominal capitalization formed to represent the reorganization committee.

The Standard Steel Co. also purchased the Shannon-McDonough iron ore property at Shannon, Ala.

The Gulf States Steel Co., inc. in Delaware Nov. 1, 1913, acquired the properties of the Standard Steel Co. as of Dec. 1, 1913.

Southern Steel Works, (not a corporation).

N. Thayer Montague, trustee, 122 W. Eighth St., Chattanooga, Tenn.

Works at 610 Boyce St., Chattanooga: 1 Tropenas converter (2-ton); 2 cupolas; 1 ham. (4,000-lb.) Crucible fur. (8-pot) dismantled 1906. Fuel, coal and coke. Annual cap., 1,500 tons. *Idle, for sale or for lease.*

Southwestern Iron Works, Wellington, Kansas, see 1910 Supplement, p. 31, 1912 Supplement, p. 52; 2-ton Schwartz fur. removed to works of Central Foundry Co., Oklahoma City, Okla.

SPANG, CHALFANT AND CO., INC., Union Bank Bldg., Pittsburgh, Pa.

Org. June 9, 1899; inc. July 3, 1899. Capital stock: auth. \$2,000,000, issued \$1,856,000.

Henry Chalfant, P.; George Matheson, Jr., V. P., & G. M.; A. M. Bell, Sec. & T.; R. D. Morris, G. M. S.; W. J. Hampton, G. S.

Sales offices: Chicago, 1922 McCormick Bldg.; St. Louis, 1706 Boatmans Bank Bldg.

Brand: "Etna."

Etna Iron and Tube Works, Etna, Pa.: blt. 1828; Rolling mill dept.: 24 single puddling fur.; 2 scrap fur.; 6 heat. fur.; 4 trains (18" muck, 12" skelp, 16" skelp, 22" plate); 3 ham. Product: iron skelp, annual cap., 90,000 tons. Forge Dept.: blt. 1909, f. o. Feb., 1909; 6 charcoal fires; 1 ham. Fuel, charcoal. Product: charcoal blooms for own use, annual cap., 7,200 tons. Tube Dept.: 2 butt-weld and 5 lap-weld fur. Fuel, nat. and prod. gas and coal. First mill to use nat. gas exclusively. Two galvanizing pots for galvanizing pipe. Product: pipes, $\frac{1}{8}$ " to 24"; tubes, $1\frac{1}{2}$ " to 13", annual cap., 200,000 tons.

SPENCER WIRE CO., Worcester, Mass. Est. 1828.

H. W. Goddard, P. & T.; E. B. Dunn, Sec.

In connection with its wire works at Worcester the company operates a forge.

Forge at Worcester: blt. 1909, first charcoal blooms made May 26, 1909; 2 forge fires; one 3-ton hammer. Fuel, charcoal.

Product: charcoal billets from scrap for own use only, annual cap., 1,500 tons.

SPRING CITY BLOOM WORKS, Real Estate Trust Bldg., Philadelphia, Pa.

G. H. Leaf, P.; Jacob Rech, Jr., T.

Works at Spring City, Pa.: blt. 1884, rebt. 1907; 8 forge fires; 1 ham. Fuel, charcoal.

Product: charcoal iron blooms, billets and slabs from scrap, annual cap., 4,800 tons.

Spring Lake Iron Co. (The), see 1908 Directory, p. 391. Fruitport Furnace at Fruitport, Mich., dismantled in 1913.

SPRING VALLEY IRON AND ORE CO., Spring Valley, Wis.

Org. and inc. 1904. Capital stock: \$125,000; bonds, \$5,000.

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 at Spring Valley: 1 stack; blt. 1892-93 for charcoal fuel, f. o. Feb. 20, 1894; remod. 1905 for coke fuel; 66' x 13' 6"; 3 2-pass Siemens hot-blast stoves, 63' x 17'; steam blowing eng. (16,000 cfm.). Coke; local brown hematite. Company owns Cady Creek iron ore mine, Spring Valley. Charcoal kilns (idle), annual cap., 1,800,000 bushels. *Last active in 1910.*

Product: malleable, Bessemer and foundry pig iron, annual cap., 35,000 tons.

STANDARD BRAKE SHOE & FOUNDRY CO., Pine Bluff, Ark

Org. Aug. 2, 1915; not inc. Investment, \$40,000.

S. F. Dilley, Owner; F. L. Dilley, G. M.

May install 1 5-ton A. O. H. steel fur. early in 1916; estimated annual cap., 5,000 tons steel and manganese steel castings. Fuel, nat. gas.

Product and annual cap.: gray iron castings, 4,000 tons; brass and semi-steel castings, 200 tons, for sale.

STANDARD CHAIN CO., First National Bank Bldg., Pittsburgh, Pa.

Org. and inc. Feb. 2, 1900. Capital stock: com. auth. \$285,000, issued \$284,871.43; pref. auth. and issued, \$515,700; bonds \$389,000.

John C. Schmidt, P.; at York, Pa. W. A. Myler, V. P.; Frank A. Bond, Sc., G. M., G. S., & P. A.; Stanley Mann, T. & A.; C. M. Power, G. S. M.; at Pittsburgh.

Selling agents in Atlanta, Baltimore, Chicago, Denver, Montreal, Nashville, New York, Philadelphia, St. Louis, St. Paul, San Francisco, Tacoma, and Wooster (Ohio).

Product: merchant bars, light rails, chain iron, chains and saddlery hardware.

The company operates a rolling mill at Columbus, Ohio; and chain works at Braddock, Carlisle, and York (2 plants), Pa., Columbus and St. Marys, Ohio, and Marion, Ind.

Hayden Rolling Mill, Columbus, Ohio (formerly known as Columbus Iron Works): blt. 1854; 2 single and 7 double puddling fur.;

2 4-d. and 1 6-d. heat. fur.; 5 trains (17" 3-h. 1-st. muck; 16" bar mill with 3-h. 1-st. roughing, 2-h. 1-st. finishing; 12" 3-h. 3-st. bar; 10" 3-h. 4-st. guide; 8" 3-h. 5-st. guide (idle). Fuel, coal, prod. gas and oil. Product: merchant bars, light rails, chain iron, iron for saddlery work, annual cap., 25,000 tons.

IRON AND STEEL CHAIN AND FORGING WORKS.

Carlisle Chain Works, Gettysburg Junction, Pa. Product, coil, cable, trace, fancy, and other chains; sizes, from $\frac{1}{8}$ " to 1".

Krein Chain Works, Marion, Indiana. Product, oil-welded, proof-tested coil, log, boom, dredge, and other chains; sizes, from $\frac{3}{16}$ " to 1".

Krein Chain Works, St. Marys Ohio. Product, coil, trace, and, fancy chains; also German coil chains; sizes, from $\frac{1}{8}$ " to 1".

P. Hayden Saddlery Hardware Company's Chain Works Department, Columbus, Ohio. Product, coil, trace, stud, and other chains; sizes, from $\frac{1}{8}$ " to $2\frac{1}{2}$ ".

Standard Chain Company, Braddock, Pa. Product, coil, cable, wagon, conveyor, hand-made, and shackle chains; sizes, from $\frac{3}{16}$ " to $2\frac{1}{4}$ ".

York Chain Works, York, Pa. Product, coil, cable, trace, and other chains; sizes, from No. 8 wire to 1-inch cable.

All the above works also make light forgings for railroad cars.

York Electric Welding Works, York, Pa. Product, electrically welded chains.

Standard Chemical Co. (The), of Toronto, Ltd., see Canadian Supplement, p. 11; succeeded by The Standard Chemical Iron and Lumber Co. Deseronto Furnace at Deseronto, Ont., leased to Standard Iron Co. in 1912, and sold to that company in 1913.

STANDARD CRUCIBLE STEEL CASTING CO., Milwaukee, Wis.
Org. and inc. Aug. 10, 1910. Capital stock: \$10,000.

F. M. Weis, P.; M. A. Koosch, V. P.; H. M. Koosch, Sc. & T. Works at 30th and Lloyd Sts., Milwaukee: blt. 1910, first steel made Aug. 12, 1910; 3 8-pot and 1 4-pot crucible fur. Fuel, crude oil. Adding one 3-ton A. O. H. fur.

Product: crucible steel castings for sale, annual cap., 1,500 tons.

STANDARD IRON CO., Goodrich, Tenn.

Inc. May, 1899. Capital stock: auth. \$50,000, issued \$35,000.

J. H. Ambrose, P.; A. H. Robinson, V. P.; H. F. Ambrose, Sc. & T.; at Nashville, Tenn.

Selling agents: Hickman, Williams & Co.; Rogers, Brown & Co.; Dornhoff, Joyce & Co.

Brand: "Standard."

Standard Furnace at Goodrich, Tenn.: 1 stack; blt. 1885, rebt. 1891; 55' x 12'; iron pipe stove; 3 steam blowing eng. Coke: local brown ore from company's mines. *Last active in 1913.*

Product: foundry and soft pig iron, annual cap., 24,000 tons.

STANDARD IRON CO., LTD., 319 Coristine Bldg., Montreal, P. Q., Canada.

Inc. Feb., 1912. Capital stock: com. \$150,000; pref. 7% cum. \$150,000.

R. J. Mercur, P.; S. F. Belknap, Sc. & T.; at Montreal. F. H. Hardy, V. P.; at 1836 Peoples Gas Bldg., Chicago, Ill.

Selling agents: R. J. Mercur & Co., Ltd., Montreal.

Brands: "Deseronto," "Parry Sound."

Product: charcoal pig iron, total annual cap., 56,000 tons.

Deseronto Furnace, Deseronto, Ontario: 1 stack, 61' x 10½', blt. 1898, last rebt. 1912; warm blast; 1 steam blowing eng.; 4 water-tube boilers, 150 H. P. Charcoal; imported Lake and local ore. (Formerly owned by The Standard Chemical Co. of Toronto, Ltd.; later by The Standard Chemical Iron and Lumber Co. of Canada, Ltd.; leased by Standard Iron Co. in 1912 and purchased by that company in 1913.) Product: malleable and car wheel pig iron, annual cap., 20,000 tons.

Parry Sound Furnace, Parry Sound, Ontario: 1 stack, 60' x 12', construction commenced July, 1912; f. o. Aug. 22, 1913; 2 Durham stoves, 30' x 26'; 1 turbo blower (2,000 cfm.); 3 tubular boilers, 200 H. P. Charcoal; hematite and magnetite ore. Product: warm blast charcoal pig iron, annual cap., 36,000 tons.

Standard Iron Mining and Furnace Co., see 1908 Directory, p. 279, formerly owned Chickies Furnace at Chickies, Pa. Property sold at receiver's sale in 1909 to a committee representing the bondholders. The blast furnaces were dismantled in 1910.

Standard Roller Bearing Co., see 1908 Directory, p. 259. Crucible steel furnaces were dismantled in 1912.

STANDARD STEEL CASTINGS CO. (The), 3315 West 73rd St., Cleveland, Ohio. Branch office, 30 Church St., New York.

Org. and inc. Dec., 1912. Capital stock: auth. \$125,000, issued \$93,000.

Julius F. Janes, P.; E. H. Janes, V. P.; E. P. Harris, Sc.; S. C. Cutler, T.

Works at Cleveland: 1 Tropenas converter (2-ton); built 1913, f. o. May 1, 1913; 1 Bretaud converter (2-ton); 1 cupola. Fuel, nat. gas and coke.

Product: steel castings for sale for automobiles, trucks, cranes, etc.; annual cap., 6,000 tons.

STANDARD STEEL CO., Ltd. (lessee), 1025 Transportation Bldg., Montreal, P. Q., Canada.

Works corner of Hutcheson and Atlantic Sts., Montreal: completed in spring 1913, f. o. June, 1913; 1 1½-ton Baillet special converter; 2 cupolas. Fuel, coke. (Owned and formerly operated by Belgo-Canadian Steel Co., Ltd.)

Product: steel castings, annual cap., 1,800 tons.

STANDARD STEEL WORKS CO., Morris Bldg., Philadelphia, Pa.
 Inc. Dec. 23, 1907. Capital stock: \$3,000,000; bonds \$4,000,000.
 Wm. Burnham, P. & T.; A. A. Stevenson, V. P.; Robert Radford, Sc. & A. T.

Sales offices:

Chicago, Railway Exchange Bldg.
 Denver, First National Bank Bldg.
 New York, Hudson Terminal Bldg.
 Portland, Ore., Spalding Bldg.
 Richmond, Va., Traveller Bldg.
 St. Louis, Wright Bldg.
 St. Paul, Pioneer Bldg.
 San Francisco, Flood Bldg.
 City of Mexico.

Works at Burnham, Pa.: tilting open hearth fur.; heat. fur.; hammers; tire mills, wheel rolling mills; hydraulic presses.

Product: steel tires, steel tired wheels, steel rolled wheels, steel railway springs, pipe flanges, and crusher rings; iron and steel castings and forgings.

STANDARD TINPLATE CO., Canonsburg, Pa.

Org. and inc. 1901. Capital stock: \$500,000.

Louis Follet, P.; B. W. Bennett, V. P. & T.; W. J. Reese, Sc.

Works at Canonsburg: blt. 1902-03; f. o. March, 1904; 22 sheet and 22 pair fur.; 22 hot mills (3 29" x 30", 7 29" x 32", 6 28" x 30", 6 28" x 34"); 2 Mesta 3-arm pickling mach.; 9 box annealing fur.; 18 24" cold mills. Fuel, nat. gas.

Tinplate dept.: 42 sets, 36 for tinplates, 6 for terne plates. Fuel, nat. gas.

Product and annual cap.: black plates for tinning, 80,000 tons; tinplates, 1,650,000 boxes; terne plates, 42,250 boxes.

STANLEY WORKS (The), New Britain, Conn.

Org. 1852; inc. 1901. Capital stock: \$2,500,000.

Wm. H. Hart, Ch.; George P. Hart, P.; E. A. Moore, V. P.; H. B. Humason, Sc.; L. H. Pease, T.

Product: builders' hardware, cold rolled strip steel.

The company operates plants for the manufacture of hardware at New Britain, Conn., and Niles, Ohio; also a rolling mill at Bridgewater, Mass.

Bridgewater Works: orig. blt. 1785; 9 heat fur. (3 1-d., 5 4-d., 1 cont.); 2 trains (18" 3-h. 3-st., 14" 3-h. 3-st. hoop and band). Fuel, coal and prod. gas. Gray iron foundry; air furnace; 2 cupolas; annual cap., 6,000 tons gray iron, 2,000 tons air fur. castings. Product: steel bands, hoops and tack plate for own use in New Britain Works, annual cap., 40,000 tons rolled products.

STAR FURNACE CO., Jackson, Ohio.

Org. and inc. Nov. 29, 1865. Capital stock: com. \$60,000; pref. 7% cum. \$100,000.

Bernard Kahn, P.; at Cincinnati. Charles O. Brown, Sc., T., G. S. M., & P. A.; Lewis V. Brown, G. M.; at Jackson.

Selling agents: Rogers, Brown & Co.

Star Furnace at Jackson: 1 stack; blt. 1866, last rebt. 1912-13; 70' x 16' 6", 4 C. H. Foote stoves (2 75' x 18', 2 75' x 16'); 2 steam blowing eng. (37,000 cfm.); 10 tubular boilers, 1,250 H. P. Raw coal and coke; local and Lake ore.

Product: Bessemer ferro-silicon, silvery softeners, and foundry pig iron. Annual cap., 30,000 tons ferro-silicon or 60,000 tons foundry.

Stark Rolling Mill, see The Berger Manufacturing Co.

STARR MANUFACTURING CO., LTD. (The), Dartmouth, N. S.

George E. Faulkner, V. P.; H. Goudge, Sc. & G. M.; G. D. Dustan, A.

Works at Dartmouth: blt. and f. o. 1896; 4 heat. fur.; 2 trains (18" and 10"); 2 ham. Fuel, coal.

Product: merchant bar iron in rounds, squares, and flats; skates; bolts, nuts, rivets, railway and ship spikes, carriage axles, and iron and steel forgings. Annual cap., 10,800 tons merchant bars.

State National Bank of St. Louis, St. Louis, Mo.

Missouri Furnace at South St. Louis: 1 stack, blt. 1869; rebt. 1895; 76' x 15'; 4 stoves. Coke; local ore. Annual cap., 45,000 tons of foundry pig iron. (Formerly owned by St. Louis Blast Furnace Co.; acquired by present owners, Nov. 26, 1912.) *Last active in 1911.* Reported sold to Mississippi Valley Iron Co. in March, 1916.

Steel and Iron Aluminum Coating Co., see The Wilder Metal Coating & Mfg. Co.

STEEL COMPANY OF CANADA, LTD. (The), Hamilton, Ont., Canada.

Org. and inc. June 9, 1910. Capital stock: com. \$11,500,000; pref. 7% cum. \$6,496,300; bonds, \$8,850,000.

Charles S. Wilcox, P.; Cyrus A. Birge, V. P.; Robert Hobson, V. P. & G. M.; H. H. Champ, Sc. & T.; F. H. Whitton, A. G. M.; J. W. Stairs, P. A.; at Hamilton, Ont. George G. Cuttle, P. A.; at Montreal, Quebec.

Sales offices at Halifax, Hamilton, Montreal, St. John, Toronto, Vancouver, Victoria, Winnipeg.

Brands: "S. C. C." inclosed in a semi-circle, the word "Bell" in a bell and "M. R. M." for horseshoes. "Hamilton" for pig iron.

Products: pig iron, ingots, blooms and billets, iron and steel merchant bars, tie plates, fish plates, axles, forgings, horseshoes; skelp, black and galvanized iron and steel pipe; nail plate, cut nails; wire rods; plain, tinned and galvanized wire, wire nails, tacks,

wire goods, barbed wire, wire fence, etc.; spikes, bolts, nuts, rivets and washers.

Hamilton Works, Hamilton, Ont.: Blast Furnaces: 2 stacks. Furnace A. blt. 1894-95; f. o. Dec. 30, 1895; 75'6" x 16'; 4 stoves (1 Roberts, 75' x 19', 3 Gordon-Whitwell, 65' x 19'); Furnace B., 80' x 20', blt. 1906-07; f. o. Nov. 8, 1907; 4 Roberts 2-pass stoves, 90' x 21'; steam blowing eng.; Gayley dry air blast; 1 slag gran. pit. Molten metal to mixer. Conn. coke; imported Lake and Ontario ores. Product: foundry, malleable Bessemer and basic pig iron, annual cap., 200,000 tons.

Steel Works and Rolling Mills: blt. 1900; 7 B. O. H. fur. (2 25-ton, 2 45-ton, 3 55-ton); first steel made May 15, 1900; adding 3 B. O. H. fur. (70-ton) annual cap., 140,000 tons; metal mixer (200-ton); soaking pits; 2 cont. coal heat. fur.; 34" 2-h. 1-st. reversing blooming mill, 18" 2-h. 4-st. Morgan cont. billet mill; 12" to 10" 2-h. 17-st. cont. comb. rod and bar mill; 14" 3-h. 3-st. and 10" 3-h. 6-st. hand bar mills; 3 automatic spike machines. Fuel, bit. coal and nat. gas. Steam and electric power. Machine shop for own use. (Formerly owned and operated by the Hamilton Steel and Iron Co., Ltd.) Product and annual cap.: 220,000 tons ingots, 1,500 tons steel castings, 125,000 tons bars and wire rods, 175,000 kegs railway spikes, 5,000 tons forgings.

Ontario Works, Hamilton, Ont.: blt. 1861; 9 coal heat. fur.; 20" 3-h. 3-st. bar mill; 10" 3-h. 5-st. bar mill; 9" 3-h. 5-st. guide mill; 3 hammers (1 5-ton, 1 2-ton, 1 helve); 8 busheling fur. and 14" muck mill (idle). Fish plate and tie plate shop. Car and locomotive axle dept. Heavy shape forge dept.

Product: merchant steel bars, tie plates, fish plates, axles, and heavy forgings. Annual cap., 100,000 tons finished products.

Belleville Works, Belleville, Ont.: blt. 1899-1900; 9 heat. fur.; 3 trains (18" 3-h. 1-st. muck, 12" 3-h. 4-st. bar, 9" 3-h. 4-st. bar); 2 hand fed spike machines. Fuel, bit. coal. Machine shop for own use. (Formerly operated by the Belleville Iron and Horse-shoe Co.; later by the Canada Bolt and Nut Co.; acquired by present company July 1, 1910.) Product: iron and steel bars; horseshoes; pressed, ship, skimming, deck and drift spikes. Annual cap., 15,000 tons bars, 20,000 kegs spikes, 50,000 kegs horseshoes.

Notre Dame Works, 1272 Notre Dame St. W., Montreal: blt. 1857, rebld. 1900; 1 busheling fur.; 7 4-d. and 1 5-d. heat. fur.; 4 trains (18" 3-h. 1-st. muck; 18" 3-h. 3-st. bar; 12" 3-h. 4-st. merchant; 12" and 9" 3-h. 5-st. Belgian merchant mill); 1 ham., 6,000-lb. Bolt and nut department; galvanizing dept. Machine shop for own use. Fuel, bit. coal. (Formerly operated by the Montreal Rolling Mills Co.) Product: bar iron and bar steel, horseshoe iron and steel, nail and hinge plate, horseshoes, horse nails; plain, tinned and galvanized wire, wire nails; cut nails; bolts, nuts, rivets, tacks, staples, etc.; lead pipe, shot, putty,

white lead, etc., are also made. Annual cap., 35,000 tons finished rolled iron and steel, 110,000 kegs horseshoes, 30,000 boxes horse nails, 30,000 tons wire, 275,000 kegs wire nails, 30,000 kegs cut nails, 85,000 kegs bolts, 30,000 kegs nuts, 9,000 kegs rivets.

St. Patrick Works, 104 St. Patrick St., Montreal: blt. 1859; 4 heat. fur.; 2 trains (18" 3-h. 3-st., 9" 3-h. 5-st. Belgian); bolt and nut department. (Formerly operated by the Montreal Rolling Mills Co.) Product: bar iron and bar steel, railway and pressed spikes, track bolts, nuts, rivets, and washers. Annual cap., 25,000 tons bar iron and steel, 55,000 kegs railway and pressed spikes, and 5,000 tons bolts, nuts, rivets, washers, etc.

St. Henry Works, 172 St. Ambroise St., Montreal: rebt. 1906; 1 butt-weld fur.; 4 gas prod. Fuel, prod. gas. (Formerly operated by the Montreal Rolling Mills Co.) Product: iron and steel pipe, black and galvanized; conduit, fence, and signal pipe; couplings and nipples; size of pipe $\frac{1}{4}$ " to 4". Annual cap., 25,000 tons.

Dominion Works, 75 St. Joseph St., Lachine: blt. and f. o. 1885. (Formerly operated by The Dominion Wire Mfg. Co., Ltd.)

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, 125,000 kegs wire nails.

Canada Works, Hamilton, Ont.: blt. 1887; 100 wire drawing blocks for wire $\frac{3}{8}$ " to 33 gauge; 150 wire nail machines. Also equipped to make wire and plate tacks, wood screws, machine screws, bolts, nuts and rivets. Product: wire nails, plain wire, cold rivets, wood screws, etc. Annual cap., 24,000 tons wire, and 240,000 kegs wire nails.

Western Wire and Nail Co. Works, London, Ont.: blt. 1897; 18 wire nail machines. Product: wire nails, staples, barbed wire, braided clothes line, etc. (Owned by Steel Co. of Canada; operated by Western Wire & Nail Co.) Annual cap., 36,000 kegs wire nails.

Superior Works, Fort William, Ont.: bldg. works for manufacture of wire and wire nails. Buildings erected; no machinery installed.

Brantford Works, Brantford, Ont.: Product: machine, carriage, tire and stove bolts; cold square and hexagon nuts, hot rivets, $\frac{3}{16}$ " to 1", cold rivets, $\frac{3}{16}$ " to $\frac{5}{8}$ ", annual cap., 10,000 kegs.

Gananoque Bolt Works, Gananoque, Ont.: Product: machine and carriage bolts and nuts, annual cap., 5,000 kegs.

Gananoque Forge Works, Gananoque, Ont.: Product: carriage and carriage top hardware, small automobile forgings and other miscellaneous small forgings. (Formerly operated by Gananoque Forging Works Co.; acquired by present company July 1, 1910.)

Swansea Works, Toronto, Ont.: machine, carriage, tire, and sleigh-shoe bolts, $\frac{3}{16}$ " to 2", track spikes, $\frac{3}{8}$ " to $\frac{3}{16}$ ", hot and cold hexagon and square nuts, $\frac{3}{16}$ " to $\frac{7}{8}$ " hole; bridge, boiler, etc., rivets, $\frac{1}{8}$ " to $1\frac{1}{2}$ "; annual cap., 90,000 kegs bolts and nuts, 10,000 kegs

rivets. (Formerly owned and operated by Toronto Bolt and Forging Co., Ltd.)

Sunnyside Works, Sunnyside, Toronto: blt. 1893; abandoned and dismantled April, 1913. (Formerly owned and operated by the Toronto Bolt and Forging Co., Ltd.; later by Canada Bolt and Nut Co., Ltd.)

Steel Foundry Co. (The), Cincinnati, Ohio. Winton Place Works, see 1908 Directory, p. 376, sold to Armor Steel Foundry Co., Feb., 1911.

Steel Products Co., lessee, Plain City, Ohio. Crucible steel plant at Plain City dismantled.

STEPHENSON CHARCOAL IRON CO., Marquette, Mich.

Org. and inc. 1911. Capital stock: \$150,000.

Charles H. Schaffer, P.; J. R. Van Evera, Sc. & T.; at Marquette.

Grant T. Stephenson, V. P.; J. H. Walker, S.; at Wells, Mich.

Selling agents: Pickands, Brown & Co., Chicago.

Brand: "Schaffer."

Stephenson Furnace at Wells, Delta County, Mich.: blt. 1911-12, blown in July 29, 1912; 60' x 10'; 1 double Durham hot-blast stove; 1 steam blowing eng. (700 cfm.); 4 tubular boilers, 500 H. P. Charcoal; Lake ore.

Product: special grades charcoal car wheel pig iron, annual cap., 20,000 tons.

STERLING STEEL FOUNDRY CO., Braznell Bldg., Braddock, Pa.

Org. April 19, 1911; inc. May 9, 1912. Capital stock: auth. \$500,000, issued \$313,000; bonds \$80,000.

George W. Smith, P. & G. M.; Wm. Nease, V. P.; M. A. Quinn, Sc. & A.; H. G. Smith, T.; D. B. Webb, G. S.; G. J. Chandler, G. S. M.; G. C. Smith, P. A.

Works at Braddock: blt. 1902, f. o. Oct., 1902; 2 Swindell A. O. H. fur. (20-ton). Fuel, nat. gas.

Product: steel castings for sale, annual cap., 12,000 tons.✓

Sterlingworth Railway Supply Co., see 1908 Directory, p. 262. Rolling mill dismantled 1907. Property sold at receiver's sale May 21, 1909.

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: 1624 Rockefeller Bldg., Cleveland, Ohio.

Brand: "Stewart."

Stewart Furnace at Sharon: 1 stack, blt. 1872, last rebt. 1909; 75' x 17'; 4 Cowper-Kennedy stoves, 70' x 18'; 2 steam blowing eng.; 7 water-tube boilers, 2,825 H. P. Slag granulating pit, annual cap., 73,000 tons. Machine shop for own use. Conn coke: Lake ore.

The company owns 155 bee-hive coke ovens at Uniontown, Pa., annual cap., 90,000 net tons.

Product: Bessemer, low-phosphorus, basic, foundry and forge pig iron, annual cap., 100,000 tons.

STOCK PROCESS STEEL CO., 910 Majestic Bldg., Detroit, Mich. Org. Nov., 1912; inc. Jan., 1913. Capital stock: com auth. and issued \$200,000; pref. auth. \$100,000, issued \$96,000. Allen Mosher, P.; Paul J. Brown, V. P.; W. H. Reamsbottom, Sc. & T.

Works at Oakman Ave. and Detroit Terminal R. R., Detroit: 1 Stock converter ($\frac{1}{2}$ -ton), blt. 1913, f. o. May 28, 1913. Fuel, oil. (Works partly erected by Buchanan Steel Co., sold to B. H. Wark, Aug. 2, 1912; acquired by Stock Process Steel Co., Jan. 10, 1913.) *Idle*.

Product: steel castings for sale for automobile parts, gear blanks, etc., annual cap., 1,500 tons.

STRONG STEEL FOUNDRY CO., 33 Norris St., Buffalo, N. Y. Org. and inc. 1908.

O. H. P. Champlin, P., T., G. M., & P. A.; A. A. Berrick, V. P.; James E. Keller, Sc. & G. S. M.; H. S. Champlin, A.

Works at 33 Norris St., Buffalo: blt. 1912-13, f. o. Feb., 1913; 1 A. O. H. fur. (15-ton); 20-pot crucible fur. (idle). Fuel, oil.

Product: acid open hearth steel castings, manganese, chrome, nickel, etc., alloy steel castings for sale, annual cap., 7,500 tons.

STRUTHERS FURNACE CO. (The), 1106 Citizens Bldg., Cleveland, Ohio.

Org. May 18, 1906; inc. June 2, 1896. Capital stock: auth. \$1,000,000, issued \$750,000; bonds, Oct. 1, 1915, \$550,000.

W. C. Runyon, P.; A. Grossman, Sc. & T.; F. W. Ream, P. A.; at Cleveland. L. S. Baldwin, S.; at Struthers, Ohio.

Anna Furnace at Struthers, Ohio: 1 stack, blt. 1869, last rebt. 1909; 83' x 21'; 5 stoves, 70' x 18'; 4 steam blowing eng. (60,000 cfm.); 9 water-tube boilers, 3,236 H. P.; 1 single-stand Uehling casting machine; slag granulating pit, 75,000 tons cap., for slag sand. Coke; Lake ore.

Company owns 200 bee-hive coke ovens at Fairbank, Pa., annual cap., 150,000 net tons.

Product: basic and malleable pig iron, annual cap., 170,000 tons.

STURGES & BURN MANUFACTURING CO., 508 S. Green St., Chicago, Ill.

Org. and inc. Dec., 1890. Capital stock: com. \$200,000; pref. 6% cum. \$200,000.

Frank Sturges, P.; Lee Sturges, V. P. & T.; W. H. Burn, Sc.; Charles Murbach, P. A.; at 508 S. Green St., Chicago, Ill. A. R. Perry, G. S.; at Melrose Park, Ill.

Sales office: New York, 50 Church St.

Works at Bellewood, Ill.: Original works erected 1865 at Harrison and Green Sts., Chicago; first tinplates made Jan., 1894; machinery removed to Bellewood, Ill.; first tinplates made at Bellewood, Jan., 1913; 4 sets, 1 for tinplates, 3 for tinning stampings. Fuel, coal. Buys black plates.

Product: tinplates for own use; milk cans, creamery supplies, sheet metal specialties, etc.

Superior Portland Cement Co. (The), see 1908 Directory, p. 366, formerly owned Center Furnace at Superior, Ohio. Furnace abandoned in last half of 1909.

SUPERIOR STEEL CO., Carnegie, Pa.

Org. and inc., Aug., 1892. Capital stock: auth. \$500,000, issued \$479,700.

James H. Hammond, P.; Joseph F. Hedges, Sc., T., & P. A.; F. R. Schneider, G. M.; H. F. Devens, G. S. M.; at Carnegie. E. W. Harrison, V. P.; at Philadelphia.

Sales offices:

Chicago, Adams and Jefferson Sts., Steel Sales Corpn.

Detroit, Ford Bldg., Geo. W. House (agent).

New York, 30 Howard St., W. H. Leonori & Co. (agents).

Philadelphia, 1205 Real Estate Trust Bldg.

St. Louis, E. R. Hensel Steel & Copper Co. (agents).

Works at Carnegie: blt. 1892, f. o. Jan. 3, 1893; 4 4-d. heat. fur., 3 trains (16" strip mill with 20" 3-st. roughing, 3-st. edging, 16" 5-st. finishing; 14" strip mill with 20" 1-st. roughing, 14" 3-st. edging and flat, 14" 5-st. finishing; 12" strip mill with 20" 1-st. roughing, 14" 2-st. edging, 12" 5-st. finishing); 8 annealing fur.; 40 pair cold rolls (5 8", 23 10", 2 11", 6 12", 4 14"). Fuel, nat. gas and coal.

Product: hot and cold rolled strip steel, annual cap., 120,000 tons.

Susquehanna Iron Co., see 1908 Directory, p. 151. Aurora Furnace at Wrightsville, Pa., and Vesta Furnace at Watts, Pa., have not been operated since 1903 and are abandoned but not dismantled. Columbia, East End, and Susquehanna Mills and the Susquehanna Tube Mill were leased to E. T. Edwards, Jan. 1, 1913. Union Street Mill at Columbia, Pa., has not been operated for years and is abandoned. York Mill at York Pa., was damaged by a boiler explosion, August 10, 1908, and dismantled in 1909-10.

Susquehanna Smelting Co., Lockport, N. Y., see 1910 Supplement, p. 15, 1912 Supplement, p. 24; electric furnace for manufacture of ferro-silicon blt. 1908, dismantled in Feb., 1910.

Sutton Co. (The C. E.), Toledo, Ohio, see 1908 Directory, p. 362, after the death of C. E. Sutton was reorganized on Sept. 1, 1909, and was succeeded by the Toledo Steel Casting Co.

SWEDISH CRUCIBLE STEEL CO., Detroit, Mich.

Org. Nov., 1910. Capital stock: \$60,000.

Nels L. Olson, P., T., & G. M.; A. J. W. Nixon, V. P.; C. E. Bandfield, Sc.

Works at Detroit: blt. 1911; 4 4-pot crucible fur.; 1 Bretaud converter (1,500-lb.); first crucible steel made April 1, 1911; first converter steel made Feb. 1, 1913. Fuel, oil and coke.

Product: small steel castings for sale, annual cap., 1,000 tons (200 tons crucible, 800 tons converter.)

SWEDISH CRUCIBLE STEEL CO. OF CANADA, LTD. (The), Windsor, Ont., Canada.

Org. and inc., June, 1913. Capital stock: com. \$100,000.

Nels L. Olson, P., T., & G. M.; C. E. Bandfield, Sc., A., & P. A.; T. W. Prothero, G. S. M.; at Detroit, Mich. A. J. W. Nixon, V. P.; at Delafield, Wisconsin.

Windsor Works, Windsor, Ontario: blt. 1913-14; 3 4-pot crucible fur.; 2-ton Bretaud converter; 1 54" cupola; crucible steel first made April, 1914: converter steel, Spring, 1914. Fuel, oil and coke.

Product: steel castings for sale for agricultural purposes, automobiles, etc. Annual cap., 375 tons crucible, 2,500 tons converter castings.

SWEET'S STEEL CO., Williamsport, Pa.

Inc. Aug. 5, 1903. Capital stock: com. auth. \$300,000, issued \$270,000; pref. auth. \$300,000, issued \$263,450; bonds \$150,000. Robert L. Ahles, P. & G. M.; John M. Young, T.; D. F. Swartz, Sc.; R. K. Cheney, G. S.; C. C. Steel, G. S. M.; John E. Spotts, P. A.

Selling agents: New York, 1123 Broadway, J. H. Finch; Philadelphia, Land Title Bldg., L. E. Kipe.

Works at Newberry, suburb of Williamsport: blt. 1903-04; first steel made July 27, 1904; first rolled products Sept. 17, 1904; 2 B. O. H. fur. (20-ton); 5 gas prod.; 2 coal stoker-fired cont. heat. fur.; 3 trains (16" 3-h. 2-st. rail, 14" 3-h. 7-st. bar, 9" 3-h. 3-st. bar). Fuel, coal and prod. gas. Machine shop for own use.

Product: ingots, forging billets, merchant steel bars and shapes, concrete reinforcing bars, special shapes, special analysis steel, rerolled steel rails, 12 to 60-lb. Annual cap., 20,000 tons ingots, 40,000 tons bars and shapes, 50,000 tons rerolled rails.

SYLVESTER CO. (The), Danvers, Mass.

Org. and inc. Oct. 1, 1901. Capital stock: com. auth. \$125,000, issued \$111,000; pref. 6% cum. auth. \$50,000, issued \$26,000.

John P. Sylvester, V. P. & T.; Norman W. Bingham, Jr., Sc.; H. W. Sylvester, S.

Works at Danversport, Mass.: orig. blt. before 1790, last rebt. 1909; 3 single puddling fur.; 3 3-d. heat. fur.; 3 trains (18" 3-h.

3-st., 10" 3-h. 5-st., 16" 2-h. 1-st. universal mill); two hammers. Fuel, bit. coal. Machine shop for own use and jobbing. Product: merchant bars, spikes, bolts and other forgings, annual cap., 25,000 tons.

SYRACUSE CRUCIBLE STEEL CO., Syracuse, N. Y.

Inc. Aug. 12, 1912. Capital stock: \$10,000.

J. A. Mathews, P. & G. M.; W. A. Mackenzie, Sc.; H. S. Fulmer, A. T.; at Syracuse, N. Y. C. C. Ramsey, V. P.; George A. Turville, T.; at Pittsburgh, Pa.

Works at Syracuse, N. Y.: (leased by the Halcomb Steel Co.): four 24-pot crucible fur.; 12" 3-h. 5-st. bar mill; 20" 3-st. sheet mill; 18" 3-st. sheet mill; under construction. The plant will be operated as a part of Halcomb Steel Co. plant.

Tassie Belle Furnace, New Birmingham, Texas, see New Birmingham Development Co.

TAYLOR (N. & G.) CO., Chestnut and Third Sts., Philadelphia, Pa. Partnership, est. 1810. L. L. Helmer, G. M.; at Cumberland, Md. Operates two plants at Cumberland, Md.

Product: open hearth steel billets, sheet and tin bars, black plates for tinning, tinplates and terne plates.

Steel Works at Cumberland: blt. 1899; 3 B. O. H. fur. (20-ton); 1 cont. heat. fur.; 24" 3-h. 2-st. bar mill; 8 pair and 8 sheet fur.; 8 hot black plate mills (7 26" x 30", 1 26" x 32"); 2 pickling mach.; 6 cold mills (5 22" x 32", 1 22" x 36"); 5 box annealing fur. Fuel, nat. gas. Product and annual cap.: ingots (35,000 tons), billets and sheet bars (30,000 tons); black sheets and black plates for tinning (20,000 tons).

Tinplate Works at Cumberland: blt. 1912-13, first terne plates made Sept. 19; first tinplates made Sept. 20, 1913; 14 sets. Fuel, nat. gas. Product and annual cap.: tinplates (375,000 base boxes) and terne plates (325,000 base boxes).

Plant at Swanson and Tasker Sts., Philadelphia, abandoned in 1913 and equipment used to partly equip new tinhouse at Cumberland.

TAYLOR (W. P.) CO., 218 Ellicott Square, Buffalo, N. Y.

Inc. May 1, 1905. Capital stock: \$150,000.

W. P. Taylor, P.; C. D. Taylor, V. P.; Frank J. Abell, Sc. & T. Works at 575 Howard St., Buffalo: blt. 1894; 1 oil-fired Stock converter (½-ton) added and f. o. 1912. Gray iron foundry. Machine shop for jobbing.

Product and annual cap.: steel castings (600 tons), gray iron castings (6,500 tons), for sale.

Taylor Iron and Steel Co., corporate title changed to Taylor-Wharton Iron and Steel Co., Oct. 1, 1912.

Taylor Steel Co., Plain City, Ohio.

Crucible steel plant at Plain City dismantled.

TAYLOR-WHARTON IRON AND STEEL CO., High Bridge, N. J.

Inc. Oct. 1, 1912. Capital stock: com. auth., \$2,000,000, issued \$1,400,000; pref. 7% cum. auth. \$2,000,000, issued \$1,900,000; bonds, \$1,500,000.

Knox Taylor, P.; H. M. Howe, V. Angerer, V. P.; W. A. Ingram, Sc. & T.; L. N. Aller, A. Sc. & A. T.

Sales offices :

Atlanta, Candler Bldg.
Boston, Sargent Bldg.
Easton, Pa.
Chicago, Fort Dearborn Bldg.
New York, 30 Church St.
Philadelphia, 25th St. and Washington Ave.
Pittsburgh, Oliver Bldg.
San Francisco, Insurance Exchange Bldg.
Scranton, Pa.
Seattle, Wash
Brand: "Tisco."

Product: manganese steel, special alloy and heat-treated castings, manganese steel safes and vaults, special track work, switches, frogs and crossings, rolling mill rolls and machinery, light and heavy forgings.

In 1909 the Taylor Iron and Steel Co. acquired the Manganese Steel Safe Co. On Oct. 1, 1912, the corporate title of the Taylor Iron and Steel Co. was changed to Taylor-Wharton Iron and Steel Co. and the entire interest in the William Wharton, Jr. & Co., Inc., of Philadelphia, and its subsidiary, the Philadelphia Roll & Machine Co., was acquired at that time. These companies retain their corporate form and operate the plants formerly owned or leased by them. In 1913 the Taylor-Wharton Iron and Steel Co. acquired the Tioga Steel & Iron Co. of Philadelphia.

The Taylor-Wharton Iron and Steel Co. operates 2 steel casting plants; see below under High Bridge Works and Wharton Works.

High Bridge Works, High Bridge, N. J.: special steel converters for manganese steel, blt. 1892, first Hadfield-Taylor manganese steel made Sept., 1892. Fuel, coal, coke and oil. Machine shop for own use in finishing castings. Product: manganese steel, nickel, chrome and other special and heat-treated steel castings for sale, annual cap., 12,000 tons.

Plainfield Works, Plainfield, N. J. (operated by Manganese Steel Safe Co.): specially equipped machine shop for finishing manganese steel safes and vaults.

Wharton Works, 25th St. & Washington Ave., Philadelphia, (operated by Wm. Wharton, Jr., & Co.): 1 Tropenas converter (2-ton), blt. 1901, f. o. June, 1901; gray iron foundry; 4 cupolas. Specially equipped machine shop for railway track work. Product and annual cap.: steel castings (3,000 tons), gray iron castings (10,000 tons), for sale; special track work for railways.

Wharton Switch Works, Jenkintown, Pa. (operated by Wm. Wharton, Jr., & Co., lessee; owned by Wharton R. R. Switch Co.). Gray iron foundry, annual cap., 1,500 tons. Special machine and switch shop makes switches, frogs, and crossings for railroads.

Philadelphia Roll and Machine Co. Works, 23rd St. and Washington

Ave., Philadelphia (operated by that company): 3 air furnaces, 1 cupola for gray iron and air furnace castings, annual cap., 8,000 tons. Machine shop: make iron sand and chilled rolls, and rolling mill machinery.

Tioga Steel and Iron Co. Works, 52nd St. and Grays Ferry Road, Philadelphia (operated by that company): Forge and machine shop for light and heavy forgings of iron, steel and special steels. Easton Works, Easton, Pa.: under construction. When completed the Wharton Works, Philadelphia, and the Wharton Switch Works, Jenkintown, operated by Wm. Wharton, Jr. & Co. Inc., and the Tioga Steel & Iron Co. Works at Philadelphia will be moved to Easton.

Temple Iron Co., Reading, Pa., formerly owned Temple Furnace at Temple, Pa.; furnace sold Nov. 20, 1915, to Delaware Steel and Ordnance Co.

TENNESSEE COAL, IRON AND RAILROAD CO., Brown-Marx Bldg., Birmingham, Ala.

Org. and inc. March 24, 1860.

A subsidiary of the United States Steel Corporation.

George G. Crawford, P.; F. H. Crockard, V. P.; H. C. Ryding, A. V. P.; L. T. Beecher, Sc. & T.; F. B. Winslow, A.; G. H. Gray, P. A.

Main sales office, Birmingham, Ala.: F. A. Burr, Sales Manager; J. W. Whatley, Manager Coal and Coke Sales.

Branch sales offices:

Boston.	Denver.	Philadelphia.
Buffalo.	Detroit.	Pittsburgh.
Chicago.	New Orleans.	St. Louis.
Cincinnati.	New York.	St. Paul.
Cleveland.		

Pacific Coast Representatives: United States Steel Products Co., San Francisco, Seattle, Portland, and Los Angeles.

Export Representatives: United States Steel Products Co., 30 Church St., New York.

Brands: for pig iron, "DeBardeleben," "Eureka," "South Pittsburgh," "Ensley," "Alice." For steel and steel rails, "Ensley" open hearth.

Product: coal and coke; foundry, forge and basic pig iron, ferro-manganese and spiegeleisen; basic phosphate fertilizer; open hearth rails, billets, slabs, bars, twisted squares, angles, and sheared plates.

Total annual capacity: 1,195,400 tons pig iron; 700,000 tons ingots, 584,800 tons blooms, billets and slabs, 379,400 tons rails, 61,000 tons bars and plates, 5,000 tons steel castings, 5,000 tons iron castings.

The company operates coal mines, iron ore mines, bee-hive and by-product coke ovens, benzol recovery plant, blast furnaces, steel works and rolling mills, and fertilizer plant.

Alice Furnace, Birmingham, Ala.: 1 stack (No. 2), blt. 1883, rebt. 1902, 75' x 18'; 6 stoves (3 Gordon, 60' x 19'; 3 Whitwell, 60' x 20'); 5 steam blowing eng. By-product coke; local red and brown ores. Product: foundry, forge and basic pig iron, annual cap., 78,200 tons.

Bessemer Furnaces, Bessemer, Ala.: 5 stacks; No. 1, blt. 1886-87, rebt. 1915, 75' 1 $\frac{1}{4}$ " x 18' 5 $\frac{1}{2}$ ", 4 Whitwell stoves, 52' x 20'; No. 2, blt. 1886-87, rebt. 1915, 74' 9" x 17' 10 $\frac{3}{8}$ ", 4 Whitwell stoves (three, 52' x 20', one 67' x 20'); No. 3, blt. 1889-90, rebt. 1900, rebt. 1915, 76' x 19' 7 $\frac{1}{4}$ ", 4 Whitwell stoves, 74' 6" x 19'; No. 4, blt. 1889-90, 75' x 17' 4 Whitwell stoves, 60' x 20'; No. 5 (Little Belle), blt. 1889-90, idle since 1906, 60' x 12', 3 Whitwell stoves, 60' x 20'; 15 steam blowing eng.; 1 slag granulating pit. By-product coke; local red and brown ores. Product: foundry and forge pig iron, spiegeleisen and ferro-manganese, annual cap., 270,800 tons.

Bessemer Rolling Mill, Bessemer, Ala.: blt. 1887-88; 4 heat. fur., 1 annealing fur.; 15 gas producers; 16" 3-h. 3-st. bar mill, 8" guide mill with 12" 3-h. 1-st. roughing, 8" 3-h. 5-st. finishing; sheared plate mill with 30' x 100" 2-h. roughing and 28' x 92" 3-h. finishing stands. Machine shop for own use. Fuel, coal and producer gas. Product: merchant bars, twisted bars, tool steel, shapes, light rails; boiler, tank and bridge plates; annual cap., 61,000 tons.

Ensley Works, Ensley, Ala.

Blast Furnaces: 6 stacks: No. 1, rebt. 1914, 92' x 22' 5 $\frac{1}{8}$ ", 5 McClure stoves (two 110' x 21'; three 100' x 21'); No. 2, rebt. 1910, 90' x 22' 6", 5 McClure stoves, 100' x 21'; No. 3 rebt. 1909, 92' 3" x 22' 6", 4 McClure stoves, 100' x 21'; No. 4, rebt. 1907, 86' 4" x 21' 9", 4 McClure stoves, 100' x 21'; No. 5, rebt. 1915, 86' 4" x 19' 11", 4 McClure stoves, 100' x 21'; No. 6, rebt. 1914, 95' x 20' 9", 4 Kennedy stoves, 93' x 21'; 23 steam blowing eng., 3 mixed pressure turbines; 1 slag granulating pit. By-product coke; local red and brown ores. Product: foundry, forge and basic pig iron, spiegeleisen and ferro-manganese, annual cap., 737,100 tons.

Steel Works: 2 mixers (250-ton, 600-ton); 2 Bessemer converters (20-ton) used for duplexing; 8 tilting B. O. H. fur. (100-ton); 8 soaking pits, 1 preheating pit fur.; 44" 2-h. 1-st. reversing blooming; 28" rail mill with 34" 2-h. 1-st. roughing and 28" 3-h. 3-st. finishing; 34" 2-h. 1-st. billet mill. Fuel, producer and coke-oven gas. Product and annual cap.: 700,000 tons open hearth ingots; 584,800 tons blooms, billets and slabs, 379,400 tons rails.

Steel Casting Dept.: blt. 1900; 1 B. O. H. fur. (15-ton). Fuel, producer gas. Gray iron foundry. Product and annual cap.: 5,000 tons steel castings, 5,000 tons iron castings for own use only.

Oxmoor Furnace, Oxmoor, Ala.: 2 stacks (alternate); No. 1, blt. 1877, last rebt. 1902, 75' x 17'; No. 2, blt. 1876, last rebt. 1899, 75' x 17'; 7 Whitwell stoves (three, 55' x 18', three, 62' x 18', one 55' x 19'); 5 steam blowing eng. Coke; local red and brown ores. Product: foundry, forge and basic pig iron, annual cap., 56,400 tons.

South Pittsburg Furnace, South Pittsburg, Tenn.: 2 stacks (alternate); No. 2, blt. 1881, 70' x 18'; No. 3, blt. 1887-88, 75' x 17'; 10 Whitwell stoves; 6 steam blowing eng. Coke; local red and brown ores. Product: foundry and forge pig iron, annual cap., 52,900 tons. *Long idle, not considered on active list.*

Coal and coke properties: The company owns about 317,000 acres of coal lands. Located on the developed portions of this property are 9 coal mining plants comprising 16 operating mines producing coal both for sale 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 bee-hive coke ovens.

At Fairfield, Ala., there is also a by-product coke plant, consisting of 280 Koppers ovens, by-product recovery plant and benzol plant.

Iron ore properties: The company owns an extensive acreage of iron ore lands in Alabama and Tennessee, upon which mines have been developed as follows: on the Red Mountain Range near Birmingham, Ala., Muscoda Group with 5 active mines, Fossil Group with 5 active mines, Ishkooda Group with 2 active mines; at Greeley, Ala., Greeley Group with 2 active mines, Champion Group with 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., and a controlling interest in the Ensley Land Co.

Tennessee Kaolin, Iron and Timber Co., Inc., see 1908 Directory, p. 342, project to rebuild Great Western Furnace at Model, Tenn. abandoned, and property sold.

TEXAS ROLLING MILL CO., Fort Worth, Texas.

Org. and inc., July 30, 1908. Capital stock: com. \$175,000; pref. 7% cum. \$65,000; bonds \$69,000.

G. W. Armstrong, P.; Wm. Bryce, V. P.; Barney Smith, V. P. & G. M.; Wm. Mitchell, Sc.; Wm. Capps, T.; J. F. Foster, A. Sc.; L. Franzheim, A.

Works at Fort Worth: blt. 1904-05, rebt. after fire 1907; 4 busheling furnaces; 4 4-d. heat. fur.; 46' rail heat. fur.; 4 trains (16" 3-h. 2-st. muck, 16" 3-h. 2-st. bar, 10" 3-h. 4-st. guide; and 8" guide with 15" 2-h. 1-st. rail splitter, 10" 3-h. 1-st. roughing and 8" 3-h. 4-st. finishing); 1 steam ham. (1,500-lb.) Fuel, oil. Machine shop for jobbing. Bolt and nut works making bolts $\frac{3}{8}$ " to 3",

nuts $\frac{3}{8}$ " to 1", spikes $\frac{3}{8}$ " to $\frac{5}{8}$ ". Three spike machines, 4 bolt machines. (Formerly owned by Fort Worth Iron and Steel Co.; acquired by present owners June 28, 1908.)

Product: merchant bars, reinforcing bars, track bolts, nuts and spikes, annual cap., 15,000 tons.

TEXAS (STATE OF), Board of Prison Commissioners, Huntsville, Texas.

Sam Lanham Furnace, Rusk, Texas: 1 stack, blt. 1883, last rebt. 1903; 65' 6" x 12', 3 stoves, 60' x 16'. Conn. and Stonega coke; local hematite ore. *Last active in 1909.*

Product: foundry and forge pig iron, annual cap., 36,000 tons.

THOMAS FURNACE CO. (The), Milwaukee, Wis.

Org. June, 1901; inc. Mar., 1904. Capital stock: \$150,000.

John M. Thomas, P.; at Milwaukee. W. Aubrey Thomas, V. P.; T. E. Thomas, T.; at Niles, Ohio.

Thomas Furnace at Milwaukee: 1 stack, 80' x 18'9", blt. 1908 replacing old stack, blt. 1873, dismantled 1908; 2 Massicks and Crooke stoves, 75' x 18' and 2 T. E. Thomas stoves, 90' x 18'; 3 steam blowing eng. (2 high press. 42" x 54" x 84", 1 low press. 84" x 60" x 84") 48,000 cfm.; 6 water-tube boilers, 2,400 H. P. Coke: Lake ore. Slag granulating pit. Machine shop and electrical shop for own use. Company is interested in iron ore mines at Iron Mountain, Mich., annual cap., 100,000 tons.

Product: Bessemer, malleable Bessemer and strong foundry pig iron; specialty, low-phosphorus iron (under .035 P.). Annual cap., 90,000 tons.

THOMAS IRON CO. (The), Easton, Pa.

Org. Feb. 4, 1854; inc. April 4, 1854. Capital stock: \$2,500,000; bonds \$600,000.

R. H. Sweetser, P. & G. M.; Oliver T. Case, Sc.; L. K. Dffenferfer, T. & A.; Elbridge Walker, G. S. A.; A. R. Palmer, P. A.; at Easton. Edwin Thomas, V. P.; at Catasauqua.

Sales agents:

Boston, 50 Congress St., E. Arthur Tutein.

New York, 90 West St., Phillip E. Wright.

Philadelphia, 628 Stephen Girard Bldg., Phillip E. Wright.

Brand: "Thomas-Vanadium."

Product: foundry, forge, malleable, and basic pig iron.

The company owns and operates 4 blast furnace plants with 7 stacks, total annual cap., 308,000 tons.

Hokendauqua Furnaces, Hokendauqua, Pa. 2 stacks: No. 1, blt. 1854, rebt. 1894, 80' x 17'; No. 3, blt. 1863, rebt. 1899, remod. 1914, 81' x 18'6"; 8 Taws and Hartman stoves, 80' x 18', 1 McKee 2-pass stove, 90' x 22'; 2 steam blowing eng. (83,126 cfm.); 18 boilers (2 water-tube, 16 tubular) 2,100 H. P. Machine shop for own use. Coke; New Jersey magnetite,

local, Lake and foreign ore. No. 5 furnace dismantled in 1914; No. 6 in 1915. Annual cap., 175,000 tons.

Lock Ridge Furnaces, Alburtis, Pa.: 2 stone stacks. No. 7, 60' x 13', blt. 1867, rebt. 1915, steel shell inside stone stack; No. 8, blt. 1869, rebt. 1914, 60' x 13'; two 2-pass fire-brick stoves 70' x 18'; 6 iron pipe stoves used as preheaters; 3 steam blowing eng. (22,667 cfm.); 10 cylindrical boilers, 500 H. P. Anthracite coal and coke; New Jersey magnetite, local, Lake and foreign ore. Annual cap., 42,000 tons.

Saucon Furnaces, Hellertown, Pa.: 2 stacks. No. 10, blt. 1868, rebt. 1894, 75' x 16'; No. 11, blt. 1870, 60' x 16'; iron pipe stoves; 3 steam blowing eng. (29,074 cfm.); 14 boilers (1 water-tube, 1 tubular, 12 cylindrical) 1,250 H. P. Anthracite coal and coke; New Jersey magnetite, local, Lake and foreign ore. Annual cap., 55,000 tons.

Keystone Furnace, Island Park, Easton, Pa.: 1 stack. No. 9, blt. 1876, 65' x 19'; 3 Siemens-Cowper-Cochrane fire-brick stoves, 60' x 16'; 1 steam blowing eng. (12,930 cfm.); 16 boilers (8 cylindrical, 8 flue) 800 H. P. Anthracite coal and coke; New Jersey magnetite, local, Lake and foreign ore. *Last active in 1911.* Annual cap., 36,000 tons.

Iron ore properties: The company owns the Richard mine at Wharton, N. J., annual cap., 100,000 tons (new vertical shaft being sunk, will increase cap. to 200,000 tons); and several other properties in Lehigh and Berks Counties, Pa., of which only one was operated in 1915.

Railroad properties: The company owns interests in the capital stock of the following companies:

The Ironton Railroad Co. (100%)

The Saucon Valley Railroad Co. (100%)

The Catasauqua and Fogelsville Railroad Co. (40%)

The Mount Hope Mineral Railroad Co. (33⅓%)

Thomas Steel Co. (The), acquired The Niles Iron and Steel Co. and The Niles Corrugating Co., both of Niles, Ohio, Feb. 1, 1909. The Thomas Steel Co. was absorbed by The Brier Hill Steel Co., Feb. 1, 1912.

Thomson-Houston Electric Co., see General Electric Co.

THROPP, JOSEPH E., sole owner, Earlston, Pa.; P. O. address, Everett, Pa.

George W. Hughes, G. S.

Selling agents: Pilling & Crane, Philadelphia.

Earlston Furnace, Earlston, Pa.: 1 stack, blt. 1883-84, rebt. 1909-10; 82' x 18' 9"; 4 stoves (3 Siemens-Cowper-Cochrane, 90' x 18' 6" and 1 Hartman, 87' x 16'); 4 steam blowing engines and 1 turbo-blower (55,000 cfm.); 13 boilers (3 water-tube, 4 tubular, 6

cylindrical) 3,000 H. P. Single press briquetting plant for flue dust, annual cap., 20,000 tons. Machine shop for own use. W. Va. and Broad Top (Kearney) coke; Lake and local hematite.

Product: foundry and mill pig iron, annual cap., 95,000 tons.

Saxton Furnaces, Saxton, Pa.: 2 stacks. No. 1, blt. 1880-81, f. o. Oct. 16, 1882, 70' x 18'; 3 stoves, 70' x 18'; No. 2, blt. 1886-87, remod. 1912, 81' x 17' 8"; 3 stoves, 60' x 18'; 2 steam blowing eng. (30,000 cfm.); 8 water-tube boilers, 2,000 H. P.; slag granulating pit for slag ballast and filling. Machine shop for own use. Bee-hive coke ovens, see below. Broad Top coke; local hematite and Lake ore. No. 1, long idle, has no lining; No. 2 last active in 1913. Product: foundry, forge and basic pig iron, annual cap., 170,000 tons.

Iron ore properties: Mines at Dungarvin, Pa., Catoclin, Md., and Antietam, near Harpers Ferry, W. Va., annual cap., 45,000 tons. Also undeveloped property at McCoys Ferry, W. Va., and in Bedford and Huntington Counties, Pa.

Limestone quarry at Ashcom, Bedford County, Pa. Annual cap. now 130,000 tons, to be increased to 200,000 tons by improvements now being made.

Coal mines and coke ovens: owns Kearney coal mines in Bedford County, Pa., and Melrose and Gordon mines, near Minersville, Huntingdon County, Pa. Total acreage about 5,000 acres; annual capacity of mines, 350,000 tons. Improvements being made at Gordon and Melrose mines will increase total annual cap. to 525,000 tons. Also owns 440 bee-hive coke ovens: 170 at Kearney, 180 at Saxton and 90 at Melrose, Pa., annual capacity 203,000 net tons.

Tidewater Steel Co., see 1908 Directory, pp. 271, 274. Plant at Chester, Pa., sold at receiver's sale Sept. 14, 1909. Delaware River Steel Co. organized by the purchasers to take over the property, Nov. 17, 1909.

TITAN COMPANY (The), Newark, N. J.

Louis M. Atha, T.

Owns the works formerly held by the Atha Steel Casting Co. On Feb. 4, 1910, the Titan Steel Casting Co. acquired the works; acquired by The Titan Co. Jan., 1914. The works were leased to Hewitt Steel Corporation January 1, 1916.

Works at Newark: 3 B. O. H. fur. (25-ton). Bessemer plant blt. 1901, dismantled 1909. Annual cap., 45,000 tons of steel castings.

TITANIUM ALLOY MANUFACTURING CO., Niagara Falls, N. Y.

William F. Meredith, P.; at 15 Wall St., New York. A. Thompson, G. M. & G. S. A.; at Niagara Falls.

Sales offices: Chicago, Peoples Gas Bldg.; Detroit, Ford Bldg.; New York, 15 Wall St.; Pittsburgh, Oliver Bldg.

Works at Niagara Falls: blt. 1907, enl. 1909, f. o. Aug. 17, 1907; equipped with electric furnaces for manufacture of titanium alloys and other alloys, annual cap., about 3,000 tons.

TIVANI ELECTRIC STEEL CO., LTD., Belleville, Ontario.

J. W. Evans, P.; J. F. Wills, V. P. & Sc.; John M. Wallace, T. & G. M.

Works at Belleville, Ontario: blt. 1912-13; f. o. June 13, 1913; 1 1-ton fur. for the manufacture of electric steel by the Evans-Stanfield direct process. Fuel, charcoal and electricity. (May install 1 3-ton fur. for the manufacture of steel castings.)

Product: high speed tool steel, annual cap., 400 tons.

TOLEDO FURNACE CO. (The), Western Reserve Bldg., Cleveland, Ohio.

Org. and inc. 1902. Capital stock: \$2,000,000; bonds, \$1,500,000. H. G. Dalton, P.; G. H. Beaumont, V. P. & G. M.; S. E. Bool, Sc. & A.; E. P. Williams, T.; H. S. Pickands, P. A.; at Cleveland. E. B. Hull, G. S.; at Toledo.

Selling agents: Pickands, Mather & Co., Cleveland.

Brand: "Toledo."

Toledo Furnaces, Toledo, Ohio: 2 stacks; Furnace A, 80' x 20', blt. 1902-03; f. o. May 31, 1903; Furnace B, 80' x 21', blt. 1906-07, f. o. Jan. 5, 1907; 8 Kennedy stoves, 90' x 22'; dry blast; 5 steam blowing eng. (100,000 cfm.); 19 water-tube boilers, 8,200 H. P.; double-strand Uehling casting mach.; slag gran. pit (long idle). Adding 2 Dwight & Lloyd sintering furnaces, annual cap., 50,000 tons. Conn. and W. Va. coke; Lake ore. Erecting 94 Koppers by-product coke ovens, annual cap., 350,000 net tons.

Product: Bessemer, basic, malleable, and foundry pig iron, annual cap., 300,000 tons.

TOLEDO STEEL CASTING CO. (The), Toledo, Ohio.

Org. and inc. 1904, reorg. 1909. Capital stock: com. auth. \$100,000, none issued: pref. 6% cum. auth. \$100,000, issued \$85,000; bonds \$50,000.

S. D. Carr, P.; J. B. Nordholt, V. P.; C. C. Smith, Sc., T. & P. A.

Works at Toledo, Ohio: blt. 1890; one 2-ton Tropenas converter, first converter steel made June, 1905; 1 cupola. Fuel, coke and oil. (Formerly The C. E. Sutton Co.; reorganized under the name of The Toledo Steel Casting Co., Sept. 1, 1909.)

Product: general machine castings for sale; carbon and vanadium steel castings for automobile and electric work; annual cap., 2,500 tons.

TONAWANDA IRON AND STEEL CO., North Tonawanda, N. Y.

Org. and inc. May, 1899. Capital stock: \$500,000.

Wm. A. Rogers, P.; Wm. T. Shepard, Sc.; at Erie County Savings Bank Bldg., Buffalo. Wm. M. Mills, T.; at North Tonawanda.

Selling agents: Rogers, Brown & Co.

Brands: "Niagara," "Tonawanda Scotch."

Furnaces at North Tonawanda: 2 stacks; A, blt. 1873, rebt. 1890-91, 76' x 18'; B, blt. 1895, f. o. Nov. 5, 1896, 80' x 18'; 8 Cowper-Kennedy stoves (3 70' x 18', 5 80' x 18'); 5 steam blowing eng. (100,000 cfm.); 12 water-tube boilers, 4,000 H. P. Coke; Lake ore.

Product: foundry, forge and malleable pig iron, annual cap., 180,000 tons.

Toronto Bolt and Forging Co., Ltd., see Canadian Supplement, p. 17, acquired by Canada Bolt and Nut Co. and merged in The Steel Co. of Canada, July 1, 1910.

Transit Supply Co., Minneapolis, see 1910 Supplement, p. 30. Makes converter steel castings for exclusive use of Twin City Lines.

TREADWELL ENGINEERING CO., Easton, Pa.

Org. and inc. Sept., 1910. Capital stock: auth. \$450,000, issued \$411,600; bonds \$149,000.

J. H. Killinger, P.; W. I. Gassert, Sc. & T.; A. A. Neave, G. M.; A. J. McVay, G. S. M.; R. W. Foltz, P. A.

Sales offices: Chicago, 208 LaSalle St., A. K. Hamilton; New York, 140 Cedar St., E. R. Euston; Philadelphia, 1011 Chestnut St., T. H. Merkel, Jr.

Works at Easton, Pa.: blt. 1911; 1 Heroult electric furnace (2-ton). Fuel, oil and electricity. Also gray iron foundry, pattern, machine and forge shops. Three ham. (500, 2000-lb., 1 trip); 1 upset press and 2 bulldozers.

Product: electric steel castings and rolling mill machinery. Annual cap., 2,000 tons of castings for sale and own use.

TREDEGAR CO. (The), Richmond, Va.

Inc. 1867. Capital stock: auth. \$2,000,000, issued \$1,000,000; bonds \$200,000.

Archer Anderson, P.; Archer Anderson, Jr., V. P.; J. R. J. Anderson, Sc. & T.; St. G. M. Anderson, S.; John T. Anderson, G. S. A.

Brands: "Piedmont," "IXL," "Roadster," "Cranberry," "Prairie," "Togo," and "Tredegar," for horseshoes.

Works at Richmond: blt. 1836; 13 coal heat. fur. (3 2-d., 3 3-d., 7 4-d.); 7 gas heat. fur. (4-d); 12 coke heat. fur. (2 2-d., 4 3-d., 6 4-d.); 1 scrap fur.; 7 trains (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 machines. Gray iron and brass foundry; product, car wheels, projectiles and general castings. Machine, blacksmith and boiler shops; make car forgings, projectiles and machinery. Hydroelectric and water power.

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.

TREMONT NAIL CO., West Wareham, Mass.

Org. and inc. 1858. Capital stock: \$100,000.

Horace P. Tobey, P.; Wm. A. Leonard, T., G. M., G. S. M., & P. A.; at West Wareham. George U. Crocker, V. P.; at 50 Congress St., Boston.

Sales office: Boston, Mass., 70 Kilby St.

Brands: "Percha plates," "Percha nails."

Tremont Nail Works at West Wareham (R. R. Station, Tremont): blt. 1820, enl. 1846; 2 B. O. H. fur. (30-ton); 6 Stubblebine hot-blast heat. fur.; 2 trains (30" 2-h. 1-st. blooming, 18" 3-h. 3-st. skelp); 150 cut nail mach. Fuel, coal and producer gas. Steam, water and electric power. Gray iron foundry and machine shop for own use. Galvanizing plant.

Product: ingots, billets, nail plate and cut nails. Annual cap., 30,000 tons of ingots and rolled products; 200,000 kegs of cut nails.

Tropenas Steel Co., see 1908 Directory, p. 322. Works completed and acquired by the Edgar Allen American Manganese Steel Co. (now known as American Manganese Steel Co.) June 8, 1910.

TRUMBULL STEEL CO. (The), Warren, Ohio.

Org. and inc. April 12, 1912. Capital stock: com. \$1,500,000; pref. \$1,000,000; bonds \$250,000.

J. Warner, P.; D. W. Kerr, V. P.; W. McFate, Sc.; Lloyd Booth, T.; C. B. Myers, A.; W. H. B. Ward, G. M.; A. N. Flora, A. G. M.; D. H. Oskin, G. S. M.; L. G. Gorman, P. A.; at Warren, Ohio. Philip Wick, V. P.; at Youngstown, Ohio.

Selling agents: New York City, Grand Central Terminal Bldg., F. H. Colladay; Kansas City, R. A. Long Bldg., H. S. Buck.

Brand: "Trumbull."

Works at Warren, Ohio: construction begun July, 1912, f. o. July 31, 1913; 24 sheet and pair fur.; 14 black sheet mills (2 44", 10 36", 2 32"); sheets 40" wide, 156" long, 10 to 30 gauge; 10 hot black plate mills (2 28", 6 32", 2 36"); 18 cold mills (1 48", 12 36", 5 40") 8 single-stand, 5 sets of 2 tandem; 4 plunger pickling machines; 14 box annealing fur.; 8 galvanizing pots. Machine shop for own use. Tin and Terne Plate Department: f. o. Aug. 30, 1913; 24 sets, 20 for tinplates, 4 for terne plates, approximate weekly cap., 15,000 base boxes tinplates, 5,000 base boxes terne plates. Fuel, coal. Adding two 36" hot sheet mills; four 32" hot plate mills; two jobbing mills (66" and 54"); 7 sheet and 8 pair fur.; 3 box annealing fur.; to be completed about Mar. 1, 1916.

Product: plain black sheets, galvanized sheets and black plates⁷ for tinning, annual cap., 125,000 tons (80,000 tons black and galvanized sheets, 45,000 tons black plates); tinplates (750,000 base boxes), terne plates (250,000 base boxes). Additional equipment to be installed will increase annual cap. to 150,000 tons.

TUTTLE, CHARLES W., Sole owner, Auburn, N. Y.

George W. Brockway, Mill Superintendent.

Brand: "Auburn."

Auburn Iron Works at Auburn, N. Y.: blt. 1853; 2 2-d. heat. fur.; 10" 3-h. 4-st. merchant train; 1 ham. Fuel, bit. coal.

Product: merchant bar, horseshoe bar and staybolt iron. Annual cap., 4,000 tons.

TYLER TUBE AND PIPE CO. (The), Washington, Pa.

Org. and inc. 1890. Capital stock: auth. \$1,000,000, issued \$527,100.

L. F. Doyle, P.; at New York. Charles H. Bumpus, V. P. & T.;

E. Tyler Davis, Sc.; Charles Stratman, G. S.; at Washington, Pa.

Sales office: New York, 50 Church St.

Brands: "Algerite," "Tyler," "Diamond T," "Diamond T. Special."

Works at Principio Furnace P. O., Md., (leased): blt. 1883-84; 12 fires; 2 hammers: coke run-out attached. (Owned by the Whitaker Iron Co., Wheeling, W. Va.)

Product: charcoal blooms for boiler tubes from pig iron and scrap, annual cap., 8,000 tons.

Works at Washington, Pa. (owned): blt. 1890-91; 5 3-d. heat. fur.; 2 trains, both 18" 2-h. 3-st. grooved skelp mills; 18 knobbling fires; 2 ham. Tube dept.: 5 lap-weld furnaces.

Product: charcoal iron blooms and skelp for boiler tubes, annual cap., 21,000 tons; lap-weld tubes, 1" to 5½" outside diameter, annual cap., 20,000 tons.

Tyrone Iron Co. (The), see 1908 Directory, pp. 287, 289. Rolling mill and forge at Tyrone Forges, Pa., sold for scrap in 1913 and dismantled.

ULSTER IRON WORKS, Dover, N. J.

Inc. July 3, 1903. Capital stock: \$400,000.

C. R. Mulligan, P.; John Mulligan, V. P.; J. D. B. Vreeland, Sc. & T.; T. H. Smith, S.

Selling agents: Joseph T. Ryerson & Son.

Brands: "Ulster," "Ulster Special."

Works at Dover: 11 double puddling fur.; 5 heat. fur. (2 2-d., 3 3-d.); 5 trains (18" 2-h. 2-st. puddle, 20" 3-h. 2-st. and 16" 3-h. 2-st. bar, 12" with 4-st. 3-h. and 1-st. 2-h. guide, 10" with 3-st. 3-h. and 1-st. 2-h. guide); steam and water power. Fuel, bit. coal. Machine shop for own use.

Product: merchant bar iron, annual cap., 12,000 tons.

UNION FURNACE CO. (The), 77 Carew Bldg., Cincinnati, Ohio.

Org. Jan. 1, 1910; inc. Dec. 31, 1909. Capital stock: \$300,000.

J. K. Pollock, P.; D. B. Meacham, V. P.; H. E. Turner, Sc. & T.; at Cincinnati. W. M. Jefferys, G. M.; at Ironton, Ohio.

Selling agents: Rogers, Brown and Co.

Union Furnace at Ironton, Ohio: 1 stack, blt. 1873-74, last rebt. 1904; 4 Player iron pipe stoves; 2 steam blowing eng.; slag granulating pit for ballast and filling. W. Va. coke; Lake ore. (Formerly owned by Union Iron and Steel Co.; acquired by Rogers, Brown & Co. July 7, 1908; acquired by Union Furnace Co. Jan. 1, 1910.)

Product: basic and malleable pig iron, annual cap., 50,000 tons.

Union Iron Co. of Buffalo, N. Y., formerly owned blast furnaces at Buffalo; acquired by Buffalo Union Furnace Co. July 1, 1915.

Union Iron and Steel Co., see 1908 Directory, p. 113, adjudged bankrupt in 1908.

Chatham Furnace, Chatham, N. J., sold to B. H. Fry, Amenia, N. Y., May 1, 1909. Destroyed by fire Jan., 1914, and not rebuilt.

Union Furnace, Ironton, Ohio, sold to Rogers, Brown & Co., July 7, 1908. Union Furnace Co. formed to take over the property, Jan. 1, 1910.

Union Furnace, No. 1, Big Stone Gap, Va., sold to L. M. Williams, Richmond, Va., in June, 1911.

UNION IRON WORKS, Spokane, Wash.

Org. and inc. 1898. Capital stock: \$100,000; surplus \$300,000.

E. J. Roberts, P.; Austin Corbin, 2 V. P.; J. M. Fitzpatrick, Sc., T., & G. M.

Works at Spokane: blt. 1889; 1,000-lb. Tropenas converter added 1911-12, f. o. April, 1912. Machine shop for jobbing. Gray iron foundry, annual cap., 3,000 tons.

Product: steel castings for sale for mining machinery, etc., annual cap., 400 tons.

Union Pacific Railroad Co., see 1908 Directory, p. 403, formerly owned rolling mill at Laramie, Wyo., destroyed by fire in November, 1910, and not rebuilt.

UNION ROLLING MILL CO. (The), Cleveland, Ohio.

Org. and inc. 1880. Capital stock: \$600,000.

H. A. Fuller, P.; J. E. Kreps, V. P., T., & P. A.; M. L. Hopkins, Sc.

Selling agents: Bourne-Fuller Co., Cleveland.

Brand: "Union Refined."

Works at Cleveland: blt. 1866-67; 5 single puddling fur.; 9 single scrapping fur.; 5 reverb. prod. gas 4-d. heat. fur.; 4 trains (18" 3-h. 2-st. muck, 18" 3-h. 3-st. bar, 9" guide with 14" 3-h. 1-st. Belgian roughing and 9" 3-h. 4-st. finishing, 8" 3-h. 5-st. guide). Adding 21" 3-h. 4-st. bar and structural mill with 1 cont. heat fur., to be completed about Feb. 15, 1916. Fuel, coal and producer gas. Machine shop for own use.

Product: nut, bolt, rivet, and bridge iron, soft steel bars, bar iron, and shafting. Annual cap., 60,000 tons, to be increased to 110,000 tons.

Union Sheet and Tin Plate Co. acquired the works of the United Sheet and Tin Plate Co. in September, 1909; acquired Hazleton Sheet Steel Co. works at Hazleton, Pa., in October, 1909. Receiver appointed July 28, 1910; Commonwealth Title Insurance and Trust Co. of Philadelphia appointed trustee, August 14, 1909. Rolling mill at Hazleton, Pa., was sold Sept. 21, 1911, and purchased by the bondholders. Byesville Works at Byesville, Ohio, and Tuscara Works at New Comerstown, Ohio, were dismantled.

UNION SPRING AND MANUFACTURING CO., Pittsburgh, Pa.

Leonard G. Woods, P. & T.; Albert Pancoast, V. P. & G. M.

Works at New Kensington, Pa.: blt. 1902; 3 Tropenas converters (2-ton); 1 cupola; first steel made April 1, 1910. Fuel, natural gas and coke. Rivet works. Adding one 6-ton Heroult electric fur.

Product: small steel castings for sale, up to 2,000-lb.; coil and elliptic springs, journal boxes and journal box lids. Annual cap., 4,500 tons.

UNION STEEL CASTING CO., Bartlett Sq., Boston, Mass.

Org. and inc., 1910. Capital stock: \$10,000.

H. B. Whall, P. & G. S. M.; F. M. Russell, T., G. M., & P. A.; Jules Matthews, G. S.

Works at Jamaica Plain, Boston: 1 Tropenas converter (2,200-lb.); 1 cupola; first steel made Feb. 28, 1911. Fuel, coke.

Product: steel castings, annual cap., 300 tons.

UNION STEEL CASTING CO., 62nd and Butler Sts., Pittsburgh, Pa.
 Inc. April 27, 1899. Capital stock: \$2,500,000.
 C. C. Smith, P. & G. M.; J. P. Allen, V. P. & G. S. M.; S. H. Church, V. P.; W. C. Eichenlaub, Sc.; G. W. Eisenbeis, T.; J. B. Henry, G. S.

Works at Pittsburgh: No. 1 Plant blt. 1899, No. 2 Plant blt. 1911;
 5 A. O. H. fur. (25-ton). Fuel, nat. gas.

Product: steel castings for sale for general machinery work, locomotives, cranes, vaults and safes, annealing equipment; vanadium, chrome-nickel, and titanium alloy steel castings. Annual cap., 33,000 tons.

UNITED ENGINEERING AND FOUNDRY CO., Farmers Bank Bldg., Pittsburgh, Pa.

Org. July 1, 1901; inc. June 25, 1901. 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, P.; G. G. Small, 1 V. P.; F. C. Biggert, 2 V. P.; C. E. Satler, Sc.; Edward Kneeland, T.; R. W. Tener, A. T.; C. A. Johnson, 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 and Foundry Co. Dept., Canton, Ohio.

Lloyd Booth Co. Dept., Youngstown, Ohio. (2 plants.)

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.

These works are equipped for the manufacture of gray iron, semi-steel and "Adamite" castings, total annual capacity, exclusive of steel castings given below, 60,000 tons of rolls and general castings. Machine and erecting shops at the McGill & Co. Dept., Frank-Kneeland Machine Co. Dept., Lloyd Booth Co. Dept. and American Roll & Foundry Co. Dept. Steel castings are made only at Vandergrift.

Chilled Roll Foundry Co. Dept., Vandergrift, Pa.: 3 Swindell B. O. H. fur. (10, 20, and 30-ton). Fuel, natural gas. Product: steel castings for sale and for own use, annual cap., 24,000 tons.

UNITED FURNACE COMPANY, Canton, Ohio.

Org. July 22, 1915. Capital stock: com. \$2,000,000, issued \$1,200,000.

H. G. Dalton, P.; Harry R. Jones, V. P.; E. A. Langenbach, 2 V. P.; E. L. Hang, Sc.; Homer Geissen, A. Sc.; S. E. Bool, A. T.

Building blast furnace at Canton; construction commenced Aug., 1915, to be completed about July 1, 1916; one stack to be 90' x 22'; 3 2-pass side combustion chamber stoves, each 24' x 110'; 2 steam

reciprocating blowing eng. (80,000 cfm.); 7 water tube boilers, 5,600 H. P. Coke; Lake ore. Building 47 Koppers ovens, estimated annual capacity, 180,000 net tons.

Product, basic pig iron, annual cap., 160,000 tons.

UNITED IRON AND STEEL CO., Leader-News Bldg., Cleveland, Ohio.

Org. and inc. Nov. 27, 1906. Capital stock: com. auth., \$2,000,000, issued \$1,950,000; bonds, \$1,583,000.

D. R. Hanna, P.; R. L. Ireland, 1 V. P.; Max McMurray, 2 V. P. & G. M.; R. B. Maltby, Sc. & A. T.; F. B. Richards, T.; T. F. Cadden, P. A.

Selling agents: M. A. Hanna & Co.

Brands: "Cherry Valley," "Fannie."

Cherry Valley Furnace, Leetonia, Ohio: 1 stack, 80' x 19' 6", last rebld. 1907; 4 McClure stoves, 85' x 21'; 3 steam blowing eng. (50,000 cfm.); 8 water-tube boilers, 3,000 H. P. Coke; Lake ore. 1 Greenawalt pan for sintering flue dust; annual cap., 18,000 tons. 195 bee-hive coke ovens, annual cap., 125,000 tons.

Product: foundry and malleable pig iron; annual cap., 125,000 tons.

Fannie Furnace, West Middlesex, Pa.: 1 stack, 80' 10" x 18', last rebld. 1906; 4 McClure stoves, 70' x 21'; 3 steam blowing eng. (40,000 cfm.); 8 water-tube boilers, 2,500 H. P. Installing a pig-iron casting machine. Coke; Lake ore. Slag handled by steam shovel.

Product: Bessemer and basic pig iron, annual cap., 100,000 tons.

Ore properties: owns a controlling interest in the Pittsburgh Iron Ore Co. which owns and operates the Brunt mine, and leases and operates the Hobart and La Rue mines on the Mesabi Range. Annual cap. of the mines, 750,000 to 1,000,000 tons.

United Sheet and Tin Plate Co. (The), see 1908 Directory, p. 185. Works acquired in September, 1909, by the Union Sheet and Tin Plate Co.

UNITED STATES CAST IRON PIPE AND FOUNDRY CO., Burlington, N. J.

Org. and inc., Mar. 2, 1899. Capital stock: com. auth. \$15,000,000, issued \$12,000,000; pref. non-cum. auth. \$15,000,000, issued \$12,000,000; bonds, \$1,679,000.

L. R. Lemoine, P.; N. F. S. Russell, G. S. M.; at 1421 Chestnut St., Philadelphia, Pa. George J. Long, V. P.; at Louisville, Ky. B. F. Haughton, Sc. & T.; C. R. Rauth, C.; D. P. Hopkins, G. W. M.; Thomas Simons, P. A.; at Burlington, N. J.

Sales offices: Chattanooga, James Bldg.; Chicago, Peoples Gas Bldg.; Kansas City, Mo., R. A. Long Bldg.; New York, 71 Broadway; Philadelphia, 1421 Chestnut St.; Pittsburgh, Oliver Bldg.; Portland, Ore., N. W. Bank Bldg.; St. Louis, Security Bldg.; San Francisco, Monadnock Bldg.

The company operates plants for the manufacture of cast iron pipe at Addyston, Ohio; Anniston, Bessemer and Birmingham, Ala.; Buffalo, N. Y.; Burlington, N. J.; Chattanooga, Tenn.; Cleveland and Columbus, Ohio; Louisville, Ky.; Scottdale, Pa. It also owns but is not at present operating plants at Superior, Wis., and South Pittsburgh, Tenn.

The company owns Scottdale Furnace at Scottdale, Pa., leased to the Scottdale Furnace Co. The steel works and rolling mill at Superior, Wis., have been dismantled.

UNITED STATES GOVERNMENT, Department of the Army.

Watertown Arsenal, Ordnance Dept., U. S. Army, at Watertown, Mass.: 1 Tropenas converter (2-ton); 1 A. O. H. fur. (15-ton); 3 8-pot crucible fur.; 2 2-d. heat. fur.; 5 steam ham.; 1 hyd. forging press (800-ton); bolt mach.; gray iron foundry. Fuel, oil, Conn. and by-product coke.

Product: steel castings for gun carriages, armor piercing projectiles, and gray iron castings for Government work only. Annual cap., 1,800 tons Tropenas, 7,150 tons open hearth, 250 tons crucible steel castings.

UNITED STATES GOVERNMENT, Department of the Navy.

The Department of the Navy operates the following plants for the manufacture of steel castings for Government work only.

Navy Yard, Brooklyn, N. Y.: 3 cupolas; 2 converters (1 Tropenas 2-ton; 1 Stoughton, 2-ton); idle since 1913. Small converter (500-lb.) dismantled 1911. Annual cap. about 600 tons.

Navy Yard, Norfolk, Va.: 1 cupola; 1 Tropenas converter (2-net ton), blt. 1913, f. o. Oct. 9, 1913. Annual cap., about 1,000 tons.

Navy Yard, Philadelphia: 8-pot crucible steel melting fur., blt. 1911-12, f. o. Jan., 1912. Annual cap., 65 tons.

Navy Yard, Mare Island, Cal.: 1 cupola; 1 Tropenas converter (2-ton), blt. 1908, f. o. May 20, 1908. Annual cap. about 1,200 tons.

Navy Yard, Puget Sound, Washington: 1 cupola; 1 Whiting converter (1-net ton), blt. 1914. Annual cap. about 600 tons.

Navy Yard, Washington, D. C. (Naval Gun Factory): 1 A. O. H. fur. (5-ton); blt. 1913-14, f. o. May 21, 1914; 2 Tropenas converters (2-ton) blt. 1914; 15 hammers; 800-ton hydraulic press. Annual cap., 1,450 tons open hearth, 300 tons converter steel castings.

UNITED STATES HORSE SHOE CO., Marine Bank Bldg., Erie, Pa.

Org. and inc., Sept. 30, 1904. Capital stock: com. auth., \$225,000, issued \$198,700; bonds, \$100,000.

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 Road, Erie: blt. 1904-05; f. o. Mar. 16, 1905; 4 heat. fur. (3 3-d. 1 4-d.); 6 small reheate. fur.; 3 trains (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 of bars. Horse and mule shoes, annual cap., 250,000 kegs.

United States Iron and Steel Co. of Texas purchased in Aug., 1910, the plant of the Fairmont Rail Co. of Fairmont, W. Va., and used the machinery to partly equip a new plant at San Jacinto City near Houston, Texas. Construction was begun in May, 1911, and works were reported as completed in 1912 but were never operated and were sold and abandoned.

UNITED STATES RAIL CO., Cumberland, Md.

Inc. 1909. Capital stock: com. auth. and issued, \$150,000; pref. 5% cum. auth., \$150,000, issued \$143,321.

Henry Shriver, P.; H. E. Weber, 1 V. P.; W. M. Roberts, Jr., 2 V. P.; T. F. Shannon, Sec. & T.; L. C. Milholland, G. S.

Cumberland Rolling Mill, Cumberland, Md.: 2 3-d. cont. heat. fur.; 2 rail trains, each 24" 3-h. 2-st. Fuel, bit. coal and nat. gas. (Owned by Baltimore and Ohio R. R. Co.; leased by the Maryland Rail Co. Mar. 13, 1909; lease acquired by United States Rail Co., Oct., 1909.)

Product: rerolled steel rails, 8 to 40 lbs. per yd., 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, 1915, \$436,046,000; subsidiary companies' bonds outstanding Dec. 31, 1915, \$180,386,705.

Elbert H. Gary, Ch.; James A. Farrell, P.; David G. Kerr, V. P.; John Reis, V. P.; Francis Lynde Stetson, General Counsel; Richard Trimble, Sec. & T.; William J. Filbert, C.; William R. Walker, A. P.; Ward B. Perley, A. P.

Main 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 & Tinplate Co.
- * National Tube Co.
- * The National Tube Co. of Ohio.
- * Shelby Steel Tube Co.
- * American Bridge Co.
- * Minnesota Steel Co.

*The Lorain Steel Co.

*Tennessee Coal, Iron & Railroad Co.

Universal Portland Cement Co.

*Edgar Zinc Co.

*United States Steel Products Co.

*H. C. Frick Coke Co. and 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 Ry.

Bessemer & Lake Erie R. R.

*Pittsburgh Steamship Co.

Various smaller iron mining, coal, limestone, railway, land, natural gas, and dock companies.

The subsidiaries marked with a * are described in this 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:

Antwerp, Belgium, 25 Rue de Londres.

Barcelona, Spain, Vergara 5.

Batavia, Java, Weltevreden.

Birmingham, England, Lloyds Bank Chambers.

Bombay, India, 166 Hornby Road.

Brussels, Belgium, 11 Rue du Lombard.

Buenos Aires, Argentina, 544 Bartolome Mitre.

Calcutta, India, 10 Strand Road.

Cape Town, South Africa, N. Y. Mutal Life Bldg.

Genoa, Italy, Via delle Fontane 8.

Havana, Cuba, 419 Edificio del Banco Nacional de Cuba.

Johannesburg, South Africa, Consolidated Bldg.

Lima, Peru, Calle Carabaya (Coca) No. 482.

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.

Paris, France, 11 Rue Edouard VII.
 Petrograd, Russia, Gogol Str. 19.
 Portland, Ore., Selling Bldg.
 Rio de Janeiro, Brazil, 42 Rua Candelaria.
 San Francisco, Cal., Rialto Bldg.
 Santiago, Chili, Shrach Bldg., Calle Bandara, 575.
 Sao Paulo, Brazil, Rua Alvarez Penteado 35.
 Seattle, Wash., 1054 Fourth Ave.
 Shanghai, China, 24 A Kiangse Road.
 Soerabaya, Java.
 Sydney, New South Wales, N. Y. Mutual Life Bldg.
 Toronto, Ontario, Canada, 220 King St., West.
 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, Shelby Steel Tube 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, zees, 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 steel shafting and 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; cast iron and malleable iron fittings for tubes and pipe; and brass and iron valves and cocks.

Wire rods; 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. (The), Canton, Ohio.

Org. 1903; inc. 1903. Capital stock: com. auth. \$1,500,000, issued \$1,200,000.

F. H. Snyder, P.; at Massillon, Ohio. E. A. Langenbach, V. P.; E. L. Hang, Sc.; Harry R. Jones, T. & G. M.; John McConnell, G. S.; E. F. Rogers, G. S. M.; G. W. Starr, P. A.; at Canton.

Sales offices:

Chicago, First National Bank Bldg.

Cleveland.

Detroit, Ford Bldg.

New York, West Street Bldg.

Works at Canton: blt. 1903-04; 8 B. O. H. fur. (3 50-ton, 2 60-ton, 3 75-ton); Heroult electric fur. (6-ton); adding one 15-ton Heroult electric fur.; 4 soaking pits (3 4-hole, 1 3-hole); 3 cont. bar reheat. fur.; 34" x 48" universal plate mill, 20" 3-h. 5-st. bar, 10" bar with 14" 3-h. 1-st. roughing and 10 3-h. 4-st. finishing; 9" bar with 14" 3-h. 1-st. roughing and 9" 3-h. 4-st. finishing; adding 26" Lamberton billet and jobbing mill and 8" Morgan cont. bar mill to be completed about Mar. 1, 1916; 3 ham. (800, 1,500, 3,000-lb.) Fuel, nat. and prod. gas. Machine shop for own use. First O. H. steel made July, 1904; first electric steel, Nov., 1914; first plates, Aug., 1904; first bars, April, 1913.

Building a new open hearth plant, "Plant B."; 6 B. O. H. fur. (80-ton); mixer (350-ton); four 4-hole soaking pits; 40" 2-h. blooming, 18" Morgan cont. sheet bar and billet mill. To be completed about July, 1916; annual cap., 240,000 tons ingots, 150,000 tons rolled products.

Product: ingots, slabs, forging ingots and billets, sheet bars, universal plates (8" to 48"), skelp, cold rolled shafting; high-manganese, chrome, and vanadium alloy steel. Annual cap., 240,000 tons of open hearth ingots, 35,000 tons electric ingots; 200,000 tons rolled products, to be increased to 350,000 tons.

United Steel and Iron Co., Coffeyville, Kansas, see 1910 Supplement, p. 31; 1912 Supplement p. 52; rolling mill partly built in 1910; enterprise abandoned.

UNIVERSAL ROLLING MILL CO., Bridgeville, Pa.

Inc. 1908. Capital stock: \$300,000

H. B. Duncan, P.; N. R. Baker, V. P.; W. H. Baker, Sc. & T.; E. L. Stockdale, S. M.; U. G. Miller, G. S.

Sales agent: Chicago, 536 Rookery Bldg., W. E. & J. W. Stockton. Works at Bridgeville, Pa.: blt. 1908-09, first rolled products, Mar. 1, 1909; 30-pot crucible fur. blt. 1912, annual cap., 2,700 tons; adding one 5-ton Heroult electric fur., annual cap., 7,500 gross tons; 3 trains (26" shovel plate train with 1 stand, 26" x 44" roughing, and 2 stands 26" x 32" finishing; saw sheet mill with 2 finishing stands, 26" x 68" and 26" x 32"; reversing train for plow plates and strips, with 1 roughing stand, 28" x 66", and 1 finishing stand 26" x 32"); heat. fur.; sheet and plate annealing fur.

Product: crucible steel ingots, alloy steel, saw, plow, spring and shovel steel, crucible and open hearth plates, sheets, bands, discs, etc.; automobile frame steel, wide cold rolled strips in coils or bars; annual cap., 2,700 tons crucible ingots, 20,000 tons rolled products.

UPSON NUT CO. (The), Cleveland, Ohio.

Org. and inc., Dec., 1911. Capital stock: com. \$5,000,000; pref. 7% cum. \$1,200,000; bonds, \$2,400,000.

H. A. Fuller, P.; B. F. Bourne, 2 V. P. & T.; N. J. Clarke, Sc.; H. E. Volmar, A.; H. P. Bingham, A. T.; H. C. Graham, A. Sc.; Willard Fuller, Works M.; C. E. Hill, P. A.; at Cleveland. W. A. Hitchcock, 1 V. P.; at Unionville, Conn.

Sales offices: Chicago, 308 West Lake St.; New York, 17 Battery Place.

Product: bolts, nuts, rivets and carriage hardware; steel billets, slabs and bars.

Upson Furnace at 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.; 1 single-strand casting machine; slag granulating pit. Conn. coke; Lake ore. Product, basic pig iron for own use, annual cap., 82,125 tons.

Upson Steel Works at Cleveland: blt. 1910-11; 5 B. O. H. fur. (60-ton): 4 16-ingot and 4 8-ingot soaking pits; 2 cont. heat.

fur.; 2 trains (34" 2-h. 1-st. blooming mill; and semi-continuous mill with 14" 8-st. cont., 11" 3-st. and 8" 2-st. looping). Fuel, nat. gas and coal. First O. H. ingots and blooms made April 10, 1911; first bars made June 17, 1911. Product: ingots, blooms, billets, and bars for own use and for sale. Annual cap., 200,000 tons ingots, 175,000 tons of rolled products.

Bolt and Nut Works, 2 plants: at Cleveland, Ohio, and Unionville, Conn. Product and annual cap.: bolts (520,000,000 bolts); nuts (367,500 kegs); rivets (214,500 kegs).

UTAH IRON & STEEL CO., Midvale, Utah.

C. W. Whitley, P.; N. Rosenblatt, V. P.; S. Rosenblatt, Sc.; S. A. Whitney, T.; M. Rosenblatt, M.

Works at Midvale, Utah: construction commenced Feb., 1914; first rolled products made Sept 23, 1915; two 4-d. pile and 2 busheling fur.; 3 trains, (19" 3-h. 2-st. muck., 16" 3-h. 3-st. bar, 10" 3-h. 4-st. finishing); 6 shears. Fuel, coal.

Product: flats, rounds, squares and other merchant forms, mine rails, angle iron and reinforcing bars, annual cap., 20,000 tons.

VALLEY MOULD AND IRON CO., Sharpsville, Pa.

Inc. as the Thomas D. West Foundry Co. Dec. 17, 1904; name changed April 1, 1910, to Valley Mould and Iron Co. Capital stock: com. auth. \$50,000, issued \$45,900.

George H. Boyd, P. & T.; Floyd K. Smith, V. P.; Hugh J. Garvey, Sc.; F. W. King, A.; F. W. Tickner, G. M.; E. H. Boyd, G. S.; M. J. McDowell, P. A.

Brand: "Alice."

Alice Furnace at Sharpsville: 1 stack, 70' x 14' 3", blt. 1868, rebt. 1894, remod. 1897; 4 Pollock iron pipe stoves; 4 steam blowing engines (26,309 cfm.); 6 water-tube boilers; slag granulating pit, 75,000 tons cap., for slag sand. Coke; Lake ore. (Formerly owned by the Youngstown Sheet and Tube Company; acquired Sept. 2, 1909, by the Thomas D. West Foundry Co.)

Ingot mold foundry, annual cap., 325,000 tons.

Product: basic pig iron; also Bessemer pig iron for own use in the manufacture of ingot molds; annual cap., 90,000 tons.

VAN ALLEN & CO., Front and Duke Sts., Northumberland, Pa.

Partnership, org. Sept. 23, 1913, succeeding former partnership of same title, org. 1866.

F. Round, G. M., G. S. M., & P. A.

Selling agent: New York City, 18 Broadway, Oliver Wade.

Brand: "Van Allen & Co."

Northumberland Iron and Nail Works at Northumberland, Pa.: blt. 1883, 2 2-d. heat. fur. with blast; 2 trains (20" 3-h. plate mill with roughing stand, bullheads, and finishing stand; 18" 2-h. muck mill, for sale); 45 cut nail machines. Fuel, bit. coal. Puddling furnaces dismantled in 1909.

Product: iron and steel cut nails, annual cap., 100,000 kegs.

VANADIUM ALLOYS STEEL CO., Latrobe, Pa.

Org. May 1, 1910; inc. June 10, 1910. Capital stock: \$300,000.

Roy C. McKenna, P.; J. T. Hughes, Sc.; J. E. Barnett, T.; D. T. Sipe, G. M. & P. A.; at Latrobe. W. H. McKenna, V. P. & G. S. M.; at Pittsburgh.

Sales offices: Boston, 24 Milk St.; Buffalo, 70 W. Huron St.; Chicago, 25 So. Clinton St.; Cincinnati, 507 Mercantile Library Bldg.; Detroit, Kerr Bldg.; Philadelphia, 5103 Arch St.; Pittsburgh, 1st Ave. and Ross St.

Works at Latrobe: 48-pot crucible fur.; 7 heat. fur. (1 1-d., 3 2-d., 3 3-d.); 12" 3-h. 5-st. guide mill; 4 ham. (600-lb. to 4-ton). Fuel, coal, nat. gas., and electricity. (Formerly Burns Uniform Steel and Metallic Works; acquired by Vanadium Alloys Steel Co. May 9, 1910.)

Product: crucible steel ingots, hammered and rolled carbon, alloy and high speed tool steel; annual cap., 3,900 tons ingots; 2,700 tons finished products.

VANCOUVER ENGINEERING WORKS, LTD., 519 6th Ave. West; Vancouver, British Columbia.

Inc. April, 1901. Capital stock: com. auth. \$400,000, issued \$275,000; preference, \$127,000; bonds, \$28,000.

Charles Lancaster, P.; Arthur H. Evans, Sc.; at Liverpool, England. George Giles, G. M.; at Vancouver.

Works at Vancouver: 1 2-ton Whiting converter; 1 cupola; blt. 1909, f. o. Oct. 12, 1909. Fuel, coke and crude oil. Machine shop for jobbing and own use. Gray iron foundry.

Product: steel castings for sale and own use; nickel steel castings; annual cap., 900 tons.

Velte Foundry and Machine Co., see 1908 Directory, p. 301. Tropenas converter sold. Do not make steel castings.

VERONA STEEL CASTINGS CO., Frick Bldg., Pittsburgh, Pa.

Inc. Nov. 13, 1911. Capital stock: \$750,000; all owned by Standard Steel Car Co.

J. M. Hansen, P.; William Bierman, Sc.; T. H. Gillespie, T.

Works at Verona, Pa.: blt. 1904-06; 2 B. O. H. fur. (20-ton); first steel made Apr. 4, 1905. (Formerly owned by General Castings Co.)

Product: steel castings for own use only, annual cap., 8,000 tons.

Virginia Electrolytic Co., see 1908 Directory, p. 328. Electric furnace plant for the manufacture of ferro-alloys at Holcomb Rock, Va., leased to the Electro Metallurgical Co. in 1913.

VIRGINIA IRON, COAL AND COKE CO., Roanoke, Va.

Org. and inc. Jan. 27, 1899. Capital stock: com., \$10,000,000; bonds, \$5,153,000.

John B. Newton, P.; Henry K. McHarg, Jr., V. P. & G. M.;

J. W. Cure, Sc. & T.; W. B. Bowles, A.; C. W. Owen, G. S. M.;

O. B. Newton, P. A.

Selling agents: N. S. Bartlett & Co. and Hickman, Williams & Co.

Brands: "Dora," "Watts," "Crozer," "Radford," "Max Meadows," "Graham," "Bristol."

Product: foundry, forge and basic pig iron, coal and coke.

The company owns and operates blast furnaces, iron ore mines, limestone quarries, coal mines, and coke ovens.

BLAST FURNACES.

Bristol Furnace, Bristol, Va.: 1 stack, 75' x 18', blt. 1890-91
4 Whitwell stoves (1 2-pass, 60' x 20' and 3 4-pass 60' x 20');
3 steam blowing engines (40,000 cfm.); 14 boilers (2 water-tube and 12 flue), 2,000 H. P. Looney Creek and Stonega coke; local ores. Product: foundry, forge, and basic pig iron; annual cap., 50,000 tons. *Last active in 1908.*

Crozer Furnaces, Roanoke, Va.: 2 stacks—No. 1, 70' x 17'3", blt. 1882-3; 4 2-pass stoves, 60' x 18'. No. 2, 70' x 16'3", blt. 1889; 4 stoves, 60' x 18' (3 4-pass Whitwell, 1 2-pass); 4 steam blowing eng. (60,000 cfm.); 13 water-tube boilers, 3,250 H. P. Tom's Creek and Pocahontas coke; local ores. Product: foundry, forge and basic (chill cast) pig iron, annual cap., 100,000 tons.

Dora Furnace, Pulaski, Va.: 1 stack, 75' x 18', blt. 1891-92; 4 stoves (3 4-pass Whitwell, 60' x 20', 1 2-pass, 75' x 18'); 3 steam blowing eng. (30,000 cfm.); 14 boilers (6 water-tube, 8 tubular) 2,600 H. P. Tom's Creek and Pocahontas coke; local ores. Also gray iron foundry and machine shop for own use in furnace and mine repairs, car wheels and heavy castings; annual capacity, 3,000 tons castings. Product: foundry and forge pig iron, annual cap., 50,000 tons.

Foster Falls Furnace, Foster Falls, Va., on Cripple Creek Branch of the Norfolk and Western Ry.: 1 stack, 50' x 10', blt. 1881; steam blowing eng. (5,500 cfm.); 4 return tubular boilers, 500 H. P. Charcoal; local ores. Product: cold blast charcoal pig iron for the manufacture of chilled rolls, annual cap., 3,000 tons.

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 return tubular boilers, 2,500 H. P. Pocahontas coke; local and Lake ores. Product: foundry and basic pig iron, annual cap., 40,000 tons. *Last active in 1904.*

Max Meadows Furnace, Max Meadows, Va.: 1 stack, 75' x 20', blt. 1890-91, rebld. 1899; 4 stoves (3 4-pass Whitwell, 60' x 20', 1 2-pass 70' x 20'); 2 steam blowing eng. (20,000 cfm.); 18 boilers (2 water-tube, 16 tubular) 2,100 H. P. Tom's Creek and Pocahontas coke; local ores. Product: foundry, forge and basic pig iron, annual cap., 60,000 tons.

Radford-Crane Furnace, Radford, Va.: 1 stack, blt. 1890-92, rebld 1906-7; 4 4-pass Kennedy stoves, 80' x 20'; 3 steam blowing eng. (30,000 cfm.); 24 tubular boilers, 2,400 H. P. Tom's Creek and Pocahontas coke; local ores. Installing Dwight & Lloyd sintering plant to be completed May 1, 1916, annual cap., 72,000 tons. Product: foundry and forge pig iron, annual cap., 75,000 tons.

Watts Furnace, Middlesboro, Ky.: 2 stacks; No. 1, 74' 3" x 16' 6"; No. 2, 74' 3" x 17', blt. 1889-91; 7 4-pass Whitwell stoves, 60' x 20'; 6 steam blowing eng. (60,000 cfm.); 30 boilers (6 water-tube, 24 tubular) 4,200 H. P. Looney Creek and Tom's Creek coke; local ores. Product: foundry and forge pig iron, annual cap., 110,000 tons.

Reed Island Furnace, Reed Island, Va.: 1 charcoal stack, 39' x 11', blt. 1881, dismantled 1908.

The Crescent Rolling Mills, Bristol, Va. have been abandoned. Idle since 1908 but not yet dismantled.

The company owns in fee or under lease the following iron ore mines, annual cap., 650,000 tons:

Barren Springs, Va.: Barren Springs, Morris, Swecker.

Ben Hur, Va.: Ben Hur, Truro.

Foster Falls, Va.: Cedar Run, Foster Falls, Hematite, Posey, Sanders, Walton.

Reed Island, Va.: Crawford, Hurst, Reed Island, Rich Hill.

Blue Ridge, Va.: Crozer, Dewey, Edith, Grubb, Ironville.

Cripple Creek, Va.: Little Wythe.

Max Meadows, Va.: Locust Hill, Clark's Summit.

Roanoke, Va.: Rorer, Trout.

Sylvatus, Va.: Betty Baker.

Troutville, Va.: Murray.

Bronco, Ga.: Bronco, Chamberlain.

Carter, Tenn.: Taylor.

Vaughtsville, Tenn.: Flint Knob.

The company owns in fee or under lease limestone quarries at Barren Springs, Buchanan, and Gate City, Va., and at Arthur, Tenn., with an annual cap. of 180,000 tons.

The company owns about 122,000 acres of coal lands, annual cap. of mines 1,200,000 tons. Also 800 bee-hive coke ovens at Tom's Creek, Va. (annual cap., 350,000 net tons); and 174 bee-hive coke ovens at Looney Creek, Va. (78,000 net tons).

Vulcan Charcoal Iron and Steel Co., see 1908 Directory, p. 275. Works at North Eddystone Station, Crum Lynne, Pa.; acquired by Hervey S. Walker in Dec., 1915.

VULCAN CRUCIBLE STEEL CO., Aliquippa, Pa.

Inc. in Pa. May 1, 1914, succeeding N. J. corporation of same name inc. Aug. 28, 1901.

S. G. Stafford, P. & G. M.; W. A. Campbell, Sc. & T.; R. M. Kelso, S.; at Aliquippa. J. A. Kelly, V. P.; at Pittsburgh.

Sales offices: Boston, 102 Purchase St.; Chicago, 16 So. Clinton St.; St. Louis, International Life Bldg.

Works at Aliquippa: 30-pot crucible fur., first crucible steel made March, 1902; 1 A. O. H. fur., first acid steel made June 29, 1903; 12" 3-h. 3-st. and 10" 3-h. 6-st. bar mills, first rolled products made April, 1903; 5 ham. (500 to 8,000-lb.); 2 annealing fur.

Product: carbon, alloy and high speed tool steel, annual cap., 9,000 tons acid open hearth and 3,000 tons crucible steel ingots.

Vulcan Iron Works, see 1908 Directory, p. 404. Project to install rolling mill abandoned.

WABI IRON WORKS (The), Ltd., New Liskeard, Ontario, Canada.

Org. May, 1907; inc. Feb. 19, 1910. Capital stock: com., \$40,000. A. J. Young, P.; at North Bay, Ontario. H. A. McEwen, V. P., G. S. M. & P. A.; E. M. Allen, Sc. & T.; F. L. Hutchinson, A.; at New Liskeard, Ontario. F. J. Bourne, G. M.; at Cobalt, Ontario. Works at New Liskeard; one Heroult electric furnace (1-ton); first steel made Jan. 1, 1916. Product: steel castings for sale; manganese steel and soft steel castings; annual cap., 300 tons.

WALKER, (HERVEY S.), owner, 1532 Sansom St., Philadelphia, Pa.

Vulcan Works at North Eddystone Station, Pa.: blt. 1887-88; rebld. after fire 1901; 2 single, 2 double puddling fur.; Hudson patent fur. installed 1912; 6 heat. fur.; rotary squeezer; 18" 3-h. muck mill; two 24" x 60" 2-h. plate mills. Fuel, bit. coal. Product: tinplate bars and skelp iron for boiler tubes, annual cap., 24,000 tons. Forge: 12 charcoal refinery fires; 1 $\frac{3}{4}$ -ton hammer. Fuel; charcoal. Product; charcoal iron blooms for own use, annual cap., 7,500 tons.

Ward-Dickey Steel Co., see 1908 Directory, p. 382, project for adding hot rolls abandoned.

WARMAN STEEL CASTING CO., 650 South Los Angeles St., Los Angeles, Cal.

Org. and inc. Jan. 25, 1911. Capital stock, \$50,000.

G. B. Warman, P.; Sutherland Hutton, V. P.; A. W. Ellington, Sc., T., & G. M.

Works at Redondo Beach, Cal.: blt. 1911; 2-ton electric fur. (own design); first electric steel made Sept. 26, 1913. (5 2-pot crucible fur. operated Aug., 1911 to Sept., 1913, dismantled 1914; 1-ton Stassano electric fur. operated to July, 1915, dismantled 1915.)

Product: electric steel castings for sale for automobiles, oil well tools, farming implements, road making and mining machinery, etc., annual cap., 1,800 tons.

WARNER IRON CO., Nashville, Tenn.

Org. May 13, 1899. Capital stock, \$30,000.

Joseph Warner, P. & G. M.; Edwin Warner, V. P.; J. H. Bandy, Sc., T., & P. A.

Selling agents: Hickman, Williams & Co. and Rogers, Brown & Co.

Brands: "Warner" and "Cumberland."

Cumberland Furnace at Cumberland Furnace P. O., Dickson Co., Tenn.: 1 stack, blt. 1892-93, f. o. March 25, 1893; 60' x 13'; 3 Gordon stoves; 3 steam blowing eng.; 4 boilers (3 water-tube, 1 cylindrical) 1,100 H. P. Virginia coke; local brown ore.

Company owns the Percy Mines at Riverside, Tenn., annual cap.,

50,000 tons; and Bell Bank Mine at Cumberland Furnace, annual cap., 15,000 tons.

Product: soft and foundry pig iron, annual cap., 30,000 tons.

WARREN IRON AND STEEL CO., Warren, Ohio.

Org. and inc., April, 1909. Capital stock: com., auth. \$150,000, issued \$147,500; pref. 7% cum. auth. \$50,000, issued \$33,700.

D. L. Helman, P.; C. B. Loveless, V. P.; Samuel Siddall, Sc. & T. Works at Warren: shovel works blt. 1903, plate mill added 1906-07, f. o. May, 1907; 2 2-d. heat. fur.; 1 2-d. reheating fur.; 24" sheared plate mill. Fuel, coal and nat. gas. Machine shop for own use. (Formerly operated by Penn Shovel Mfg. Co.; acquired by present company May 25, 1909.)

Product: steel plates and sheets, 15 gauge and heavier, up to 42" wide and 300" long, for saws, shovels, agricultural implements, etc.; concave discs and coulter blades. Alloy steels a specialty. Annual capacity about 12,000 tons.

WARREN STEEL CASTING CO., 2856 Lyon St., St. Louis, Mo.

Orig. and inc. Sept., 1911. Capital stock: \$12,000.

C. E. Hayden, P.; C. H. Clouston, V. P.; Charles Vastine, Sc.; W. A. Kammerer, T.; T. R. Tobin, G. S.

Works at Dorcas and Lyon Sts., St. Louis: blt. 1911, first steel made Aug. 1, 1911; 4 6-pot crucible fur. Fuel, oil. Plan to install a 1-ton Stassano electric furnace.

Product: steel castings for sale including titanium and vanadium steel castings. Annual cap., 500 tons.

Warwick Iron and Steel Co. leased its blast furnaces to The Eastern Steel Co., Feb. 2, 1912, for a term of 99 years, see The Eastern Steel Co.

Washburn Steel Castings and Coupler Co., see 1908 Directory, p. 400. Plant closed down June 1, 1908, and dismantled. Company out of business.

WASHBURN WIRE CO., Phillipsdale, R. I.

Org. April 13, 1900; inc. June, 1900. Capital stock: com. \$1,250,000; pref., 7% cum., \$2,500,000.

Eugene R. Phillips, P.; C. R. Remington, Sc., G. M., & P. A.; F. N. Phillips, T.; Thomas Wray, G. S.; at Phillipsdale. E. A. Smith, V. P.; at Providence, R. I.

Sales offices: Boston, 176 Federal St.; New York, foot of East 118th St. and 165 Broadway.

Phillipsdale Plant: blt. 1901, f. o. May, 1901; 2 Wellman tilting B. O. H. fur. (15-ton); adding 1 B. O. H. (15-ton), annual cap., 12,500 tons; 3 2-d. heat. fur.; 2 trains (24" 3-h. 1-st. blooming mill; Garrett rod mill with 16" 3-h. 1-st., 16" 2-h. 1-st., 10" 3-st. cont., 9" 7-st. Belgian); also 20" 3-h. flat mill, not owned by company and not operated. Fuel: bit. coal and oil.

Product and annual cap.: 25,000 tons ingots, to be increased to 37,500 tons; 20,000 tons wire rods.

New York Plant, foot of East 118th St. for wire drawing, annual cap., 12,000 tons.

Auburn Plant, Auburn, R. I., dismantled 1907.

Product: wire and strips; piano, music, spring, and special wires; clock, watch, and motor springs.

WASHINGTON IRON WORKS, Seattle, Wash.

Org. 1882; inc. Jan. 6, 1908. Capital stock: \$500,000; bonds, \$45,000. Gerald Frink, P.; F. G. Frink, V. P. & Sc.; C. F. Bridge, T.

Selling agencies: Portland, Ore., Zimmerman-Wells-Brown Co.; San Francisco, Cal., Leland Machinery Co.; Vancouver, B. C., Vancouver Machinery Depot, Ltd.; Manila, Phillipine Is., American Trading Co.

Works, Boulevard and Norman Sts., Seattle: blt. 1882; 3-ton Girod electric fur. added 1912, f. o. Dec. 26, 1913. Gray iron foundry. Forge, boiler and machine shops. Make a specialty of logging and hoisting machinery.

Product: steel castings for own use and for sale, annual cap., 1,000 tons; gray iron castings, 3,600 tons.

WASHINGTON STEEL AND IRON CO., Eagle Block, Spokane, Wash.

Org. and inc. Oct. 22, 1909. Capital stock: auth. \$1,000,000, issued \$296,566.

M. A. Corner, P.; E. K. K. Allen, V. P.; O. P. Moore, Sc. & T.

The company acquired the works of the Shaw Crucible Steel Co., Hoquiam, Wash., by purchase of the assets of the Rothert Steel Co. in 1909; abandoned the plant in same year and subsequently dismantled it.

Works at Leavenworth, Wash.: construction begun 1911, completed in 1914; 2 Rothert reduction fur.; 3 6-pot crucible fur.; operated for a few days in 1914.

Intend to discard Rothert process of direct reduction from titaniferous magnetite ore and install new equipment.

WASHINGTON STEEL AND ORDNANCE CO., Washington, D. C.

Org. and inc., June 1, 1911. Capital stock owned by Firth-Sterling Steel Co.

Lewis J. Firth, P.; J. W. Kinnear, 1 V. P.; W. A. Burton, 2 V. P.; H. F. Clark, Sc. & T.; C. V. Wheeler, G. M.

Works at Giesboro Manor, Washington, D. C.: 2 B. O. H. fur. (15-ton); one 1-ton Stassano electric fur.; soaking pit; 4 2-d. heat. fur.; 3 forging ham. (12-ton, 3-ton, 700-lb.); 9 drop ham. (1,000 to 4,000-lb.); 7 Bliss trimming presses. Fuel, producer gas, oil and coal. Machine shop for own use.

Product: projectiles, automobile drop forgings; steel ingots and castings for own use only, annual cap., 13,200 tons.

WASHINGTON TIN PLATE CO., Washington, Pa.

Inc., Aug. 7, 1907. Capital stock: com. auth., \$400,000, issued, \$399,500.

A. A. Vilsack, Ch.; G. W. Hannan, P.; H. J. Dallmeyer, V. P.; John F. Kraft, Sc. & T.

Works at Washington, Pa.: rebld. 1911-12, f. o. April 1, 1912; 6 hot mills (26" x 34"); 6 pair and 6 sheet fur.; 6 cold mills (3 stands of 2 sets tandem); 4 box annealing fur.; 1 pickling machine (3-arm). Fuel, coal. Ten tinning sets for tinplate only. Fuel, gas. Product: black plates for tinning, annual cap., 24,000 tons; tinplates, annual cap., 600,000 base boxes.

Waynesburg Forge, Sheet and Tin Mills, see 1908 Directory, p. 319, sold at receiver's sale Aug. 25, 1909. Three sheet mills were purchased in 1908 by the Universal Rolling Mill Co. and removed. The Osterberg Tin Plate Co. was formed by the purchasers and took over the property Sept. 8, 1909. Sheet bar mill and heating furnaces were dismantled; forge dismantled in 1911. Property acquired by American Steel Co., April 15, 1915.

Weatherly Foundry and Machine Co., Weatherly, Pa.

Org. and inc. Feb. 23, 1900. Capital stock: \$75,000; bonds, \$8,500.

T. J. Drumbor, P.; Dr. W. P. Long, Sc.; Elmer Warner, T. & G. M.; L. Bannan, G. S.; at Weatherly. J. M. Stauffer, V. P.; at Hazleton, Pa. Works at Weatherly: 2-ton Tropenas converter, partly erected. Make gray iron castings.

WEHR STEEL CO., West Allis, Milwaukee, Wis.

William E. Wehr, P.; Edward R. Wehr, V. P.; Henry W. Wehr, Sc. & T.; C. Frederic Wehr, S.

Works at West Allis: blt. 1910; first crucible steel made Sept. 10, 1910; 6 4-pot crucible fur.; one Whiting converter (2-ton); blt. 1913, f. o. June 1, 1913. Fuel, oil.

Product: steel castings for sale for machinery and general purposes.

Annual cap., 800 tons crucible, 2,500 tons converter steel castings.

Weimer Chain and Iron Co., Lebanon, Pa., see 1908 Directory, p. 285, projected converter steel casting plant not built.

Weimer, Edgar A. (owner), Lebanon, Pa.

Owens experimental blast furnace at Lebanon, 25' x 4'; blt. 1906.

(Formerly owned by Lebanon Reduction Co.; acquired by present owner in 1909.)

Weirton Steel Co., see Phillips Sheet and Tinplate Co.

Weller Rolling Mill and Forge Co., see 1908 Directory, p. 352. Company became insolvent and property was acquired by L. L. Herzberg, trustee for the bondholders under foreclosure proceedings. The property was sold at trustee's sale, Nov. 22, 1909, to the First National Bank of Gadsden and subsequently sold to the Southern Iron and Steel Co. in Oct., 1910. See Gulf States Steel Co.

WELLMAN-SEEVER-MORGAN CO. (The), Cleveland, Ohio.

Inc. April 4, 1903. Capital stock: com. auth. \$2,000,000, issued \$1,834,900; pref. 7% cum. auth. \$700,000, issued \$700,000; bonds, \$240,000.

Willard N. Sawyer, P. & G. M.; S. H. Pitkin, 1 V. P.; George H. Hulett, 2 V. P.; W. H. Cowell, Sec. & T.; N. R. Fairlamb, A. The company has two works devoted to the construction of special machinery.

Akron Works, Akron, Ohio: produce mining and hoisting machinery, Hulett ore-handling machinery, turbine water wheels, Corliss engines, Forter water-sealed valves, etc.

Cleveland Works, Cleveland, Ohio.

Steel Casting Dept.: blt. 1902-03, f. o. Jan. 29, 1903; 1 B. O. H. fur. (20-ton). Fuel, natural gas and oil. Make steel machinery castings for own use and for sale, annual cap., 6,000 tons. Machine shop produces iron and steel works machinery, ore and coal handling bridges, charging machines, electric cranes, gas producers, coke oven machinery, etc.

WELLSTON STEEL AND IRON CO., Wellston, Ohio.

Inc. 1905. Capital stock, \$1,000,000: bonds, \$507,000.

M. L. Sternberger, Jr., and H. S. Willard, Jr., receivers, appointed Nov. 23, 1915.

Selling agents: Cincinnati, Domhoff & Joyce Co.

Three blast furnace stacks at Wellston: Wellston Furnaces, 2 stacks. No. 1, blt. 1874-75, last rebt. 1908, 62½' x 13'; 4 Thomas stoves; No. 2, blt. 1874-75, last rebt. 1908, 67' x 15'; 3 Whitwell stoves; Milton Furnace, 1 stack, blt. 1873-74, last rebt. 1912, 62' x 13'; 4 Whitwell stoves, 7 steam blowing eng. (55,000 cfm.); 19 boilers (6 water-tube, 13 flue) 3,400 H. P. W. Va. coke; Lake ore.

Product: car wheel, strong foundry and malleable pig iron, annual cap., 120,000 tons.

Welsh, S. & J., 304 Walnut St., Philadelphia (owners).

The properties of the Bellefonte Furnace Co. owner of Bellefonte Furnace at Bellefonte, Pa., and iron ore and limestone properties, were sold at public auction March 27, 1914, and the company dissolved. The property was purchased for the J. Lowber Welsh estate; the blast furnace is being dismantled.

West Coast Iron Co., San Francisco, Cal. Built an open hearth furnace (40-ton) at 16th and Rhode Island Sts., San Francisco in 1913, for the purpose of making pig iron by melting scrap and iron ore. Operated for short time only, now leased to Judson Manufacturing Company.

West End Furnace Co., see 1908 Directory, p. 327. Receiver appointed in Feb., 1912. Acquired by David W. Flickwir, Roanoke, Va., Nov. 28, 1914.

West End Iron Co., see 1908 Directory, p. 284. Rolling mill and Chain Works acquired by Iron and Steel Products Co., June 9, 1909. Latter company in hands of receivers in 1910. The West End mill was ordered sold under foreclosure proceedings in Nov., 1910. Sold Dec. 31, 1910, and purchased by the bondholders. Sale confirmed and deed delivered May 17, 1911. Bought by the Columbus Chain Co. in Oct., 1912.

West Jersey Tube Works, see 1908 Directory, p. 256. Receiver appointed in Dec., 1910. Works sold for scrap and dismantled in 1911.

WEST LEECHBURG STEEL CO., Farmers Bank Bldg., Pittsburgh, Pa.

Org. and inc. May 19, 1897. Capital stock: auth. \$75,000, issued \$69,500.

J. W. Kirkpatrick, Ch.; James Lippincott, P. & M.; J. L. Kirkpatrick, V. P.; D. M. Campbell, Sc. & T.; G. W. Sheridan, A.; A. J. Robinson, S.; A. S. Geiger, P. A.

Sales offices and agencies:

Boston, 128 Sydney St. (Cambridge), Wheelock, Lovejoy & Co.

Chicago, City Hall Square Bldg., West Leechburg Steel Co.

Detroit, Dime Bank Bldg., West Leechburg Steel Co.

New York, 23 Cliff St., Wheelock, Lovejoy & Co.

Philadelphia, 15 N. 7th St., McFarland & Little.

Toledo, Ohio Bldg., Dean Higgins Co.

Works at West Leechburg, Pa.: blt. 1898; 2 B. O. H. fur. (40-ton, 30-ton); first steel made July, 1907; ingot heating fur.; 10-ton steam hammer; 4 6-d. billet heat. fur.; 12" 3-h. 9-st. and 9" 3-h. 5-st. merchant hoop and band mills; 21 cold mills; pickling and annealing depts.

Product and annual cap.: ingots for own use (40,000 tons); hoops and bands, hot and cold rolled strips from hammered blooms for blanking, stamping and drawing (55,000 tons).

WEST MICHIGAN STEEL FOUNDRY CO., Muskegon, Mich.

Org. and inc., Oct. 12, 1912. Capital stock: \$15,000.

W. E. Jeannot, P., T., & P. A.; A. Shaw, V. P. & G. M.; Edward Jeannot, Sc.

Selling agents: Chicago, 2000 Kingsbury St., A. Finkl & Sons Co.

Works at Muskegon: blt. 1911, first steel made Dec. 4, 1911; Bretaud converter (1½-ton). (Formerly owned by Muskegon Steel Casting Co.; acquired by present owners Sept. 30, 1912.)

Product: steel castings and vanadium steel castings for sale, annual cap., 1,500 tons.

WEST PENN STEEL CO., Brackenridge, Pa.

Org. and inc., Nov. 25, 1908. Capital stock: com. auth. and issued, \$350,000; pref. 7% cum. auth. \$700,000, issued \$525,000.

Joel W. Burdick, P.; John McGinley, V. P. & G. M.; Julian Burdick, Sc., T., & G. S. M.; Maurice C. Bair, A.; R. B. McKee, Jr., P. A.

Sales agencies:

Boston, Wheelock, Lovejoy & Co.
 Chicago, West Penn Steel Co. (branch office).
 Detroit, West Penn Steel Co. (branch office).
 New York, Wheelock, Lovejoy & Co.
 Philadelphia, McFarland & Little.
 Toledo, Dean Higgins Co.

Works at Brackenridge: blt. 1909, first steel and rolled products made Oct. 1, 1909; 3 B. O. H. fur. (80-ton); 3 4-hole soaking pits; 30" 3-h. 1-st. sheet bar mill; 10 sheet and 10 pair heating fur.; 10 hot mills (9 26", 1 30"); 12 single stand 24" cold mills; 17 gas box annealing fur.; 3 pickling mach. Fuel, coal and nat. gas. Steel foundry and machine shop for own use.

Product and annual cap.: ingots (120,000 tons); sheet bars (100,000 tons); all kinds of black pickled and cold rolled sheets, electric sheets (50,000 tons).

West Steel and Iron Casting Co. (The), see 1908 Directory, p. 363, corporate title changed to The West Steel Casting Co., Oct. 27, 1909.

WEST STEEL CASTING CO. (The), 811 E. 70th St., Cleveland, Ohio.

Org. and inc. Aug. 29, 1906. Capital stock: \$100,000. (Formerly known as The West Steel and Iron Casting Co.; title changed to West Steel Casting Co. Oct. 27, 1909.)

R. H. West, P., T., & G. M.; Frederick Baird, V. P.; D. P. Lansdowne, Sc. & P. A.; J. B. McGlynn, S.

Works at Cleveland: 2 3-ton converters, (one Tropenas, one Fisher) first Tropenas steel made Feb. 17, 1907; 2 8-pot crucible fur. added 1909, first crucible steel made Dec. 30, 1909. One Whiting cupola.

Product: small steel castings, automobile castings, safety dogs, cast steel motor truck wheels, alloy steel castings. Annual cap., 2,400 tons converter and 500 tons crucible castings.

West Virginia Malleable Iron Co., Point Pleasant, W. Va., have in their plant at Point Pleasant 1 A. O. H. fur. used in manufacture of malleable castings only.

WEST VIRGINIA RAIL CO. (The), Huntington, W. Va.

Org. and inc. May, 1907. Capital stock: com. auth., \$200,000, issued, \$200,000; pref. 7% cum. auth., \$50,000, issued, \$30,000. Joseph Schonthal, P.; at Columbus, Ohio. H. A. Zeller, V. P., G. M., & P. A.; Dez C. Schonthal, Sc., T., & G. S. M.; C. C. Watters, A. S.; H. H. Diehl, G. S.; at Huntington.

Works at Huntington: 1 cont. rail heat. fur.; 1 rail rerolling train

20" 3-h. 2-st. and 1-st. pinions; first rail rolled, Apr. 11, 1904, Fuel, coal and gas. Machine shop for own use.

Product: rerolled steel rails in 12, 16, 20, 25, 30, 35, and 40-lb. sections. Annual cap., 45,000 tons.

WESTERMAN AND CO. (partnership), Lockport, N. Y.

C. G. Sutliff, G. M.

Works at Lockport: blt. 1870; 3 heat. fur. (2 2-d., 1 3-d.); 2 trains (16" 3-h. 3-st. bar, 9" 3-h. 3-st. guide); electric, steam and water power.

Product: high grade screw iron, all sizes of rounds, squares, hexagons, etc., annual cap., 9,000 tons.

WESTERN CRUCIBLE STEEL CASTING CO., Minneapolis, Minn.

G. T. Honstain, P. & T.; W. J. Milne, Sc.

Works, Grand Ave., Minneapolis: blt. 1906; 6 6-pot crucible fur., first crucible steel made Dec. 26, 1906.

Product: crucible steel castings for sale, alloy steel castings, for automobiles and machinery, annual cap., 800 tons.

Western Iron Mills Co., see 1908 Directory, p. 402, formerly owned rolling mill at Denver, Colo., leased to the Western Rolling Mills Co. Plant acquired by the American Iron Mills Co. in 1910, abandoned in 1911 and dismantled in 1913.

Western Malleable Steel Co., see 1908 Directory, p. 394, plant sold to Buhl Malleable Co., Aug. 1, 1909.

WESTERN RESERVE STEEL CO. (The), Warren, Ohio.

Org. and inc. May, 1914. Capital stock: com. \$350,000; pref. 7% cum. \$250,000.

C. G. Thomas, P.; I. A. Thomas, V. P.; C. H. Lewis, Sc.; C. R. Thomas, T. & G. S. M.; F. J. Thomas, G. M.; W. W. Lewis, G. S.

Selling agents:

Chicago, 1631 Lytton Bldg. (branch office).

Cleveland, 901 Hippodrome Bldg., Henry W. Avery & Co.

New York, 30 Church St., C. H. Brushaber.

Philadelphia, Harrison Bldg., The Crowther Co.

Works at Warren: construction begun June, 1914; first hot rolled products made Jan. 4, 1915; 6 pair and sheet furnaces; 60" jobbing mill; 5 hot sheet mills (3 36" 1 40", 1 48"); 4 single-stand cold mills, 60" x 44"; 2 box annealing fur.; 2 pickling machines; 2 galvanizing pots to galvanize steel sheets for sale and own use. Fuel, coal. Metal lath and roofing plant (formerly owned by Sykes Metal Lath & Roofing Co.)

Products: flat, black and galvanized sheets, metal laths, and all forms of roofing. Annual cap., 50,000 tons.

Western Rolling Mills Co., see Western Iron Mills Co.

Western Steel Car and Foundry Co. formerly operated under lease rolling mill and carbuilding plant at Anniston, Ala., owned by Illinois Car and Equipment Co.; discontinued operation of the plant in August, 1910.

Western Steel Co., see Western Steel Works.

Western Steel Corporation, see 1910 Supplement, p. 31; 1912 Supplement, p. 54; acquired the properties of the Irondale Furnace Co. and the Irondale Steel Co. Nov. 15, 1909; receivers appointed Oct. 13, 1911; properties sold to Metropolitan Trust Co., New York, in March, 1912; the Irondale plant was acquired by the Pacific Coast Steel Co. by contract of sale in Dec., 1913 but title did not pass until July 1, 1914.

Western Steel Works, San Francisco, Cal., see 1910 Supplement, p. 32; 1912 Supplement, p. 56; crucible steel plant acquired by Enterprise Foundry Co., Mar. 1, 1912.

Western Tin Plate and Sheet Co., see 1908 Directory, p. 381. Receiver appointed, Dec., 1909. Receiver was subsequently made trustee in bankruptcy and sold the property in Nov., 1910, to Austin Lynch of Canton, Ohio.

Western Tube Co., see 1908 Directory, p. 389, owned by National Tube Co.

Wharton, Joseph, see Wharton Steel Co.

WHARTON STEEL CO., Morris Bldg., Philadelphia, Pa.

The Wharton Steel Co. was formed in 1909 to take over the individual holdings of Joseph Wharton. Capital stock: com., \$10,000,000.

Harrison S. Morris, P. & T.; J. Bertram Lippincott, V. P.; Harry C. Wenner, Sec.

Properties: The company owns 3 blast furnaces at Wharton, N. J., iron ore properties, coal lands, coke ovens and connecting railroad.

Wharton Furnaces at Wharton, N. J.: 3 stacks. No. 1, blt. 1868, last rebt. 1892; 75' x 17', 4 Hartman hot-blast stoves. No. 2, blt. 1900-01, f. o. Aug. 15, 1910, 100' x 21' 4; Roberts hot-blast stoves: No. 3, blt. 1902-03, f. o. Nov. 13, 1903, 100' x 21': 4 Roberts hot-blast stoves; steam blowing engines; 2 casting machines (1 Uehling, 1 Weimer). Gray iron and brass foundry, and machine shop for own use. Coke; New Jersey magnetite and Rossie hematite. *Last active in 1911.*

Product: basic, foundry, and forge pig iron, annual cap., 300,000 tons. Iron ore properties consist of (1) about 5,000 acres of iron lands near Wharton, N. J., comprising the entire Hibernia vein for its full length of about 3 miles and all parallel veins for about 5 miles except the Richard mine of the Thomas Iron Co. Reserves estimated at 30,000,000 tons of magnetite. Three plants for

magnetic concentration. (2) The Rossie mine near Spragueville, N. Y., reserves estimated at 60,000,000 tons of hematite.

Coal and coke properties consist of about 7,500 acres of coal lands and 300 bee-hive coke ovens at Coral, Indiana County, Pa.

The company also owns and operates the Wharton & Northern Railroad, extending from junctions with Central R. R. of N. J. and D. L. & W. R. R. on the south to N. Y., S. & W. R. R. on the north with a branch to the mines on Hibernia Hill.

The properties of the Andover Iron Co. were sold to the Pennsylvania R. R. Co. in March, 1914, and the blast furnace, known as Andover Iron Works, dismantled. The coal and coke holdings at Smithfield, Fayette County, Pa. have been worked out and sold.

Wharton (Wm.) Jr. & Co. merged in Taylor-Wharton Iron and Steel Co., Oct. 1, 1912.

WHEELING CORRUGATING CO., Wheeling, W. Va.

Org. and inc. 1890. Capital stock: com. auth., \$2,500,000, issued \$2,255,000. Controlling interest owned by the Whitaker-Glessner Co.

A. C. Whitaker, P.; W. H. Abbott, V. P.; D. H. Wagner, Sc.; H. C. Whitaker, A. Sc.; W. H. Manning, T.; H. J. Humphrey, G. S.

Sales offices:

Chattanooga, Main and Boyce Sts.

Chicago, 168 North Clinton St.

Kansas City, 218 West Third St.

New York City, 16 Desbrosses St.

Philadelphia, 1224 Hamilton St.

St. Louis, 1006 Spruce St.

Owens and operates terne plate works and two plants for galvanized sheets and other sheet specialties.

Tin and terne plate department, Wheeling, W. Va.: 6 sets used for terne plate only. Weekly cap., 15 turns, 6,360 base boxes.

Galvanizing plants at Wheeling, W. Va., and Martins Ferry, Ohio: 9 galvanizing pots. Weekly cap., 11 turns, 1,600 tons.

Product: galvanized sheets, galvanized and painted roofing, galvanized and tinned shingles, tin roofing, conductor pipes, eave troughs, valleys and gutters, nested stove pipe, elbows, embossed steel ceilings and sidewalls, buckets, tubs, coal hods, culverts, etc.

WHEELING MOLD AND FOUNDRY CO., Wheeling, W. Va.

Org. and inc., June 5, 1893. Capital stock: com. auth., \$1,000,000, issued, \$925,000; bonds, \$250,000.

C. E. Blue, Ch.; H. E. Field, P. & G. M.; H. S. Bradley, Sc.; H. Quarrier, T.; E. C. Rauschenberg, G. S.; J. W. Millard, P. A.; at Wheeling. L. V. Blue, V. P.; at Farmers Bank Bldg., Pittsburgh, Pa.

Works at Wheeling: 2 A. O. H. fur. (20-ton) blt. 1909-10, first steel made Jan. 15, 1910. Fuel, natural gas. Machine shop for jobbing. Gray iron foundry.

Product: steel castings for sale for rolling mills, engines, special machinery, and shipbuilding work, gears of all kinds. Annual cap., 10,000 tons. Gray iron castings, 20,000 tons and air furnace rolls, 6,000 tons.

WHEELING STEEL AND IRON CO., Wheeling, W. Va.

Org. and inc. April 16, 1892. Capital stock: com. auth., \$7,500,000, issued, \$6,195,400, bonds, \$2,500,000.

Isaac M. Scott, P.; John Duncan, V. P. & G. S. M.; C. J. Hunter, Sc. & T.; W. H. Higgins, A. Sc. & T. M.; H. T. Swift, A. T. & M. Order Dept.; Y. B. Haagsma, A.; E. G. Rust, G. S.; E. D. Adams, P. A.

Sales offices: Chicago, 1222 McCormick Bldg.; New York, Hudson Terminal Bldg., 30 Church St.

Brands: "Belmont," "Top Mill," "Martins Ferry," "W. S. W." "Wheeling."

Product: pig iron, slabs, billets, skelp, wrought iron and steel pipe, cut nails, tinplates, light sheets.

Properties: 3 blast furnace plants, steel works, rolling mills, tube mills, tin mills, cut nail works, etc. Coal, coke, and limestone properties.

BLAST FURNACES.

Belmont Furnace, Wheeling, W. Va.: 1 stack, 70' x 16', blt. 1874, remod. 1893: 3 Gordon fire-brick stoves, 65' x 18'; 2 steam blowing eng.; 8 flue boilers, 1,600 H. P. Conn. coke; Lake ore. Product: Bessemer and gray forge pig iron, annual cap., 75,000 tons. *Last active in 1910.*

Top Furnace, Wheeling, W. Va.: 1 stack, 80' x 18', blt. 1873-74, rebld. 1894; 3 Massicks and Crooke stoves, 70' x 19½'; 2 steam blowing eng.; 6 water-tube boilers, 1,500 H. P. 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, rebld. 1903-05; 4 Massicks and Crooke stoves, 75' x 20'; 2 steam blowing eng.; 6 water-tube boilers, 1,800 H. P. Conn. coke; Lake ore. Product: Bessemer pig iron, annual cap., 100,000 tons.

Total annual capacity of blast furnaces, 275,000 tons.

STEEL WORKS, ROLLING MILLS, ETC.

Wheeling Steel Works, Benwood, W. Va.: blt. 1885-86, f. o. Aug. 12, 1886; 2 cupolas; 2 Bessemer converters (6-ton); 2 4-hole soaking pits; 36" 2-h. 1-st. blooming mill. Product and annual cap.: 190,000 tons of ingots, 180,000 tons of blooms, billets, and slabs.

Benwood Tube Works, Benwood, W. Va.: blt. 1852, rebt. 1876-77
30 single puddling fur.; 3 2-d. gas heat. fur.; 2 trains (16" 2-h.
1-st. muck, 24" 3-h. 2-st. skelp); 3 bell-weld and 2 lap-weld fur.;
1 galvanizing pan. Fuel, coal. Product and annual cap.: 21,000
tons muck bar, 45,000 tons iron and steel skelp, 250,000 tons
wrought iron and steel pipe, $\frac{1}{8}$ " to 12".

Adding 24" 2-h. 4-st. comb. skelp and sheet bar mill, annual
cap., 100,000 tons.

Belmont Works, Wheeling, W. Va.: blt. 1849; 8 heat. fur. (3 2-d.
regenerative gas, 3 2-d. direct, 2 cont.); 4 forge fires; 3 trains
(22" 3-h. 3-st., 22" 2-h. 2-st. skelp, 16" 3-h. 2-st. skelp); 50 cut
nail mach., sizes made 2 to 60 penny. Gray iron foundry (1,200
tons) for own use. Product and annual cap.: 120,000 tons of
skelp and 120,000 kegs cut nails.

Top Mill, Wheeling, W. Va.: blt. 1867, rebt. 1872; 6 2-d. gas heat. fur.;
2 softening, 2 annealing fur.; two 22" sheet mills. Fuel, coal
and nat. gas. Product: iron and steel sheets, annual cap., 8,000
tons.

Tinplate Department, Yorkville, Ohio: blt. Sept., 1912 to Dec., 1913;
f. o. Dec. 15, 1913; 18 sheet and 18 pair fur.; 6 double annealing
fur.; 18 28" hot mills; 18 26" cold mills, 6 st. of 3 each
tandem; 2 Mesta pickling mach. Fuel, coal. Machine shop
for own use. 30 tinning sets. Fuel, nat. gas. (Built and formerly
operated by Wheeling Sheet and Tinplate Co.; acquired by present
owners, July 17, 1914.) Product and annual cap.: black plates
for tinning, 67,500 tons, coke tinplates, 1,500,000 base boxes.

Plan to add in 1916; 6 sheet and 6 pair fur.; 2 double annealing
fur.; 6 28" hot mills; 10 tinning sets. Annual cap., 22,500 tons
black plates, 500,000 base boxes tinplates.

Coal and Coke Properties: (1) owns Benwood coal mine with
825 acres of coal lands near Benwood, W. Va., annual cap., 135,000
tons; (2) owns capital stock of Wheeling Coke Co., which has 991
acres undeveloped coal lands in Lower Connellsville District,
Fayette Co., Pa.

Also owns a one-third interest in the Bessemer Limestone Co. of
Youngstown, Ohio.

WHEELING STEEL CASTING CO., Wheeling, W. Va.

Org. and inc., 1913. Capital stock: com., \$200,000.

C. H. Dowler, P. & G. M.; A. S. List, V. P.; S. M. Noyes, Sc.;
C. G. Robinson, G. S.

Works at Warwood, W. Va.: blt. 1911; 1 A. O. H. fur. (20-ton);
contemplates adding 1 B. O. H. fur. (20-ton). Fuel, natural gas.
(Formerly owned by Alloy Steel Casting Co.; acquired by present
owners, July 1, 1913.)

Product: steel ingot molds and railroad castings for sale. Annual
cap., 12,000 tons.

WHITAKER-GLESSNER CO., Wheeling, W. Va.

Inc. Dec. 28, 1903. Capital stock: com. auth., \$5,000,000, issued, \$4,270,800; pref. 8% cum., auth., \$2,000,000, issued, \$911,400; bonds, \$1,350,000.

Alexander Glass, P.; A. C. Whitaker, E. C. Ewing, Andrew Glass, V. P.; N. P. Whitaker, Sc.; G. W. Hocking, T.

Sales office: Portsmouth, Ohio.

Brands: "Crescent," "Laughlin," "Portsmouth Iron."

Product: slabs, billets, forging billets, sheet bars, black and galvanized sheets, formed roofings.

Properties: steel works and rolling mill plant at Portsmouth, Ohio, two sheet mill plants at Wheeling, W. Va., and Martins Ferry, Ohio. Controlling interest in the Wheeling Corrugating Co.

Portsmouth Works at Portsmouth, Ohio: 7 B. O. H. fur. (60-ton); 3 4-hole soaking pits; 3 trains (35" 2-h. 1-st. blooming; 24" 3-h. 3-st. sheet bar; 18" 3-h. 3-st. tie plate); 24" universal plate mill served by regenerative nat. gas heat. fur.; 2 jobbing mills (30" x 60" 3-h. and 30" x 48" 2-h.); 3 regenerative nat. gas pair and sheet fur., 2 open annealing fur.; 10 30" hot sheet mills, 3 pair, 3 sheet, 7 comb. direct gas heat. fur.; 3 30" x 48" cold sheet mills; 12 box annealing fur.; 8 plunger type pickling machines; 8 galvanizing pots. Fuel, nat. gas. Product and annual cap.: ingots, 225,000 tons; blue annealed sheets, 8 to 16 gauge, to 60" wide and 20' long, 50,000 tons; box annealed sheets, 10 to 30 gauge, to 48" wide, 50,000 tons; galvanized sheets, 45,000 tons; tie plate bars, 30,000 tons.

Whitaker Works (Crescent Iron Works), Wheeling, W. Va.: 9 black sheet mills (3 28" x 36", 3 28" x 38", 2 26" x 36", 1 29" x 44") served by 9 stoker-fired coal comb. fur.; 3 single-stand cold sheet mills (22" x 48", 22" x 44", 28" x 48"); 14 box annealing fur. Also 5 black plate mills, 28" x 36"; 5 comb. heat. fur.; 1 Mesta 3-arm pickling mach.; 4 box annealing fur.; 6 cold mills (4 24" x 35", 1 24" x 38", 1 24" x 48"); two single stands, and two stands of 2 sets tandem. Fuel, coal. Product and annual cap.: steel sheets for galvanizing (40,000 tons), black plates for tinning (20,000 tons).

Martins Ferry Works, Martins Ferry, Ohio: 6 black sheet mills (4 28" x 36", 1 26" x 36", 1 28" x 38"); 6 comb. fur.; 2 cold mills (26" x 44"); 13 box annealing fur. Fuel, coal and prod. gas. Product: sheets for galvanizing, annual cap., 27,000 tons.

The product of the Whitaker and Martins Ferry Works is for the most part used by the Wheeling Corrugating Co., a subsidiary.

Whitaker Iron Co., subsidiary of Tyler Tube and Pipe Co., owns Principio Forge at Principio Furnace, Md.

White, Dixon and Co., see 1908 Directory, p. 335, was succeeded by J. P. White & Co., Dec. 31, 1910. Company formerly leased

Center Furnace, Hematite, Kentucky, owned by Hillman Land and Iron Co. Lease surrendered Jan. 1, 1912.

WHITELEY STEEL CO., Muncie, Ind.

Org. and inc., Dec. 20, 1897. Capital stock: \$40,000.

E. J. Whiteley, P.; B. H. Whiteley, V. P.; Amos Whiteley, T.; Amos Whiteley, Jr., Sc.; G. W. Wagner, G. S.

Brand: "Crown."

Works at Muncie, Ind.: blt. 1891-93; 2 fur. (7-ton). Fuel, coal.

Product: special steel castings for sale for automobiles, pneumatic tools, gas engines, etc.; annual cap., 2,000 tons.

WICKWIRE BROTHERS, Inc., Cortland, N. Y.

Org. 1873; inc. 1892. Capital stock: \$300,000.

T. H. Wickwire, P.; C. C. Wickwire, 1 V. P.; A. F. Stilson, 2 V. P. & G. S.; F. R. Wickwire, Sc. & P. A.; Ed. Stilson, T.

Works at Cortland: first wire drawn, 1879; rod mill blt. 1900, f. o. Feb. 1, 1901; steel plant blt. 1902, f. o. Feb., 1903; 3 Wellman B. O. H. fur. (30-ton); 8 Morgan gas producers; 2 2-d. heat. fur.; 2 trains (25" 2-h. 1-st. blooming, Morgan double cont. wire rod); wire drawing blocks; 100 wire nail machines. Fuel, coal and prod. gas. Annual capacity: 40,000 tons of ingots, 36,000 tons of billets, 40,000 tons of wire rods, 15,000 tons of wire, 120,000 kegs of wire nails.

Product: wire cloth, wire netting, wire nails and other wire products.

WICKWIRE STEEL CO., P. O. Station B., Buffalo, N. Y.

Org. and inc., March, 1907. Capital stock: \$3,000,000; bonds, \$500,000.

T. H. Wickwire, P.; at Cortland, N. Y. T. H. Wickwire, Jr., 1 V. P. & T.; H. J. Woodmansee, 2 V. P.; W. A. Wickwire, Sc.; L. L. Arnold, G. S.; at Buffalo.

Brands: "Wickwire," and "Cortland."

The company owns 2 blast furnaces at Buffalo, also iron ore mines at Iron River, Mich. (Wickwire, Virgil, and $\frac{1}{2}$ Homer mines, annual cap., 400,000 tons) and reserves near Virginia, Minn., on the Mesabi Range; and limestone quarries at Gasport, N. Y., annual cap., 200,000 tons.

Harriet Furnaces (formerly Wickwire Furnace): Harriet X, 80' x 20 $\frac{1}{2}$ ' blt. 1907-08, f. o. Oct. 16, 1908; and Harriet Y, 85' x 21', blt. 1909-10, f. o. Oct. 1, 1910; 8 stoves (4 Julian Kennedy central comb., 80' x 20', and 4 McKee, 80' x 22'); 6 steam-blowing engines (130,000 cfm.); 16 water-tube boilers, 5,600 H. P. Three-strand Uehling casting machine; slag granulating pit, annual cap., 80,000 tons slag for filling. Island Slag Co., allied interest, owns plant for crushing, screening, etc., entire slag output. Machine shop for own use. Coke; Lake ore.

Product: basic, malleable and foundry pig iron, annual cap., 250,000 tons.

Plan to build steel plant and rolling mill, construction to start early in Spring of 1916; 3 B. O. H. fur. (50-ton), annual cap., 120,000 tons; metal mixer (400-ton); blooming mill, and cont. billet mill; Morgan cont. rod mill with 6 roughing and 10 finishing stands, annual cap., 120,000 tons. Wire mill and wire nail factory to be added later.

WILDER METAL COATING AND MANUFACTURING CO. (The),
Connellsville, Pa.

Capital stock: com. auth. \$75,000, issued \$57,450.

John Wilder, P. & G. M.; F. A. Kail, Sc. & T.; George Woodhall, A.
Works at Connellsville: blt. 1900, f. o. Feb. 1, 1901.

Product: aluminum coated steel sheets, annual cap., 7,500 tons.
(Formerly owned by Steel and Iron Aluminum Coating Co. and operated under lease by American Aluminum Coating Co.; purchased by Wilder Metal Coating and Mfg. Co. April 1, 1908.)

WILKES ROLLING MILL CO., Sharon, Pa.

Org. and inc. June 1, 1891. Capital stock: auth. \$45,000, issued \$30,000.

W. B. Foxall, P. & G. M.; M. W. Foxall, Sc. & T.

Works at Fisk St., Sharon: blt. 1891, f. o. 1892; 5 double puddling fur.; 1 bloom hammer; 20" 3-h. 1-st. muck mill; one 3-d. heat fur.; 1 hot black sheet mill (24"); 1 pair and 1 sheet fur.; 1 cold mill (20"); 1 box annealing fur. Tin house: blt. 1909, f. o. Jan. 21, 1910; 2 sets for terne plates (idle).

Product: muck bar; black plates for tinning, and iron and steel sheets, annual cap., 2,500 tons of sheets, 6,000 tons other rolled products.

Williams (A. R.) Machinery Co., Ltd., Toronto, Ont., Canada.

Owns the plant at Cobourg, Ont., formerly operated by the Provincial Steel Co.; rail rerolling machinery sold and shipped to Port Moody, B. C.; works partly dismantled.

Williams, L. M., Richmond, Va., (owner).

Agents: Kelly & Irvine, Big Stone Gap, Va.

Union Furnace at Big Stone Gap: 1 stack, 75' x 18', blt. 1890-92, rebt. 1903; 5 Whitwell stoves. (Formerly owned by Union Iron and Steel Co.; acquired by L. M. Williams, June, 1911.)

Product: foundry pig iron, annual cap., 50,000 tons. *Last active in 1907.*

Williamson Furnace Co., see Williamson Iron Co.

Williamson Iron Co., see 1908 Directory, p. 348, owns and formerly operated Williamson Furnace, Birmingham, Ala. The furnace was leased to the Williamson Furnace Co. July 1, 1908, lease expired in 1913. Furnace abandoned in 1914 but not dismantled.

WILLIAMSPORT IRON AND NAIL CO., Williamsport, Pa.

Inc. Apr., 1892; org. Apr. 5, 1902. Capital stock: \$100,000.

C. L. Munson, P.; C. H. Hand, Sc.; John M. Young, T. & G. M.; Wm. Jenkins, G. S.

Brand: "Williamsport Iron & Nail Co."

Works at Williamsport: blt. 1873-74; 5 double puddling fur.; 3 coal heat. fur. 1 2-d., 2 3-d.; 2 trains (18" 3-h. 3-st., 17" 3-h. 2-st. bar); 98 cut nail mach.; 5 washer mach. Fuel, coal; galvanizing pans for electro and hot galvanizing.

Product and annual cap.: iron and steel cut nails (200,000 kegs), plate washers (12,000 kegs), muck bar (3,600 tons), splice bars (3,000 tons).

WILLISTON STEEL FOUNDRY CO., LTD., 504 Robie St., Halifax Nova Scotia. Capital stock: pref. 6% cum. \$15,000.

Charles Williston, P.; C. Hedley Williston, Sc., T. & G. M.; at Halifax. Robert G. Costley, V. P. & G. S.; at Dartmouth.

Works at Dartmouth, N. S.; building a crucible steel casting plant to be in operation about May 1, 1916.

Wilmington Iron Co., see 1908 Directory, p. 321, plant sold under foreclosure proceedings, Oct. 24, 1912, to Henry A. Hitner Sons Co., Philadelphia, and dismantled in November, 1912.

Wilmington Rolling Mills, see 1908 Directory, p. 322; purchased in July, 1908, by the Keystone Steel Co. Plant dismantled in 1912.

WISCONSIN STEEL CO., Harvester Bldg., 606 S. Michigan Ave., Chicago, Ill.

Subsidiary company of the International Harvester Co. of New Jersey and owns or leases and operates the following blast furnaces, rolling mills, steel works, etc.

Herbert F. Perkins, P.; Cassius F. Biggert, V. P. & Sc.; W. M. Gale, T.; George E. Rose, G. S.

South Chicago Works, South Chicago, Ill.:

South Chicago Furnaces: 3 stacks. Furnace A, 78' x 16', blt. 1880, last rebt. 1906; 4 2-pass stoves, 75' x 20'; Furnace No. 1, 90' 6" x 21' 6"; blt. 1902-03, f. o. Aug. 7, 1903, rebt. 1914; 5 2-pass stoves (4 82' x 22', 1 90' x 22'); Furnace No. 2, 90' x 21' 6"; blt. 1906-8, f. o. June 30, 1908; 4 2-pass stoves, 90' x 22'; 9 steam blowing eng. (160,000 cfm.); 35 water-tube boilers, 12,322 H. P., furnish power for both furnaces and mills; 1 Uehling double-strand casting machine; 1 small Greenawalt flue dust sintering pan, annual cap., 3,500 tons. Molten metal to mixers. Conn., Va. and Ky. coke; Lake ore. Machine shop for own use. Product: Bessemer, and malleable pig iron, annual cap., 500,000 tons. Steel Mill: blt. 1902-03, f. o. Mar. 31, 1903, first steel made Sept. 3, 1903; 2 10-ton Bessemer converters; 2 250-ton mixers, 1 cupola; 35" 2-h. 1-st. reversing blooming mill; 8 1-hole gas-fired

soaking pits; Morgan cont. bar mill (known as No. 1 merchant mill) with 14" 2-h. 8-st. cont. roughing and 11" 2-h. 4-st. and 8" 2-h. 2-st. finishing rolls with 2 Morgan cont. heat. fur.; Morgan bar mill (known as No. 2 merchant mill) with 16" 2-h. 8-st. roughing and 14" 2-h. 3-st. finishing rolls with 2 Morgan cont. heat. fur.; bar mill (known as No. 4 merchant mill) with 14" 2-h. 4-st. roughing, 16" 3-h. 1-st., 16" 2-h. 1-st., 12" 2-h. 5-st., and 8" 2-h. 2-st. with cont. heat. fur.; shafting mill (known as No. 3) with cold drawing machines; 21" 1-st. cold rolling mill; Brightman turning and finishing machines, cutting-off machines, straightening presses and 1 1,000-ton splitting shear. Fuel, Indiana bit. coal and prod. gas. Machine shop for own use. Product: ingots, billets, blooms, and slabs, bars and shapes. Annual cap., 500,000 tons ingots, 275,000 tons billets, blooms and slabs, 300,000 tons finished bars and shapes, 25,000 tons shafting.

Deering Works Rolling Mill, 16 Fullerton Ave., Chicago, Ill.: blt. 1901, f. o. Oct. 10, 1901; 3 2-d. hand fired heat. fur.; 13" 3-h. 5-st. straight mill. Fuel, bit. coal. (Wisconsin Steel Co. lessee.) Product: merchant flats, rounds, angles, channels, and ovals rolled from old steel rails and billets, annual cap., 26,800 tons.

The company owns the Agnew mine at Hibbing, and the Hawkins mine at Nashwauk, Minn., on the Mesabi Range; also the Illinois mine at North Freedom, Wis., in the Baraboo Range. Annual cap., 1,200,000 tons of iron ore.

The Wisconsin Steel Co. also owns about 6,500 acres of coal lands in Harlan County, Ky., upon which it operates a coal mine and 408 bee-hive coke ovens at Benham, Ky., annual cap., 175,000 net tons of coke.

Witherbee, Sherman and Co. own Northern Furnace, Port Henry, N. Y., leased to Northern Iron Co.

Wood (Alan) Iron and Steel Co., see Alan Wood Iron and Steel Co.

WOOD (J.) AND BROTHERS CO., Conshohocken, Pa.

Org. and inc., Jan. 1, 1886. Capital stock: \$400,000.

C. M. Wood, P.; J. W. Wood, V. P., T., & G. M.; Walter D. Wood, Sc. & A. T.

Sales agents: New York City, 45 Broadway, A. C. Jessup.

Brands: "Blue Annealed," "Hope," "Anchor," "R. G.," "Special Electric," "Best Bloom," and "Soft Steel."

Works at Conshohocken: 2 double puddling fur.; 7 heat. fur.; 5 trains (6" 2-h. 1-st. and 4" 2-h. 1-st. bar mill, 72" and 60" sheared plate mills, 44" black sheet mill); 3 plate and 1 sheet annealing fur.; 56" cold sheet mill. Fuel, bit. coal and coke. Steam and water power. Machine shop for own use.

Product: sheared plates, $\frac{1}{4}$ " to 16 gauge; sheets, 16 to 28 gauge; flue iron, corrugated iron, etc. Annual cap., 20,000 tons.

WOODSTOCK IRON AND STEEL CORP. (The), Anniston, Ala.

Org. and inc., 1906. Capital stock: \$500,000.

J. B. Carrington, P. & T.; T. D. Donoho, Sc.

Brand: "Woodstock."

Woodstock Furnaces at Anniston: 2 stacks; A, last rebt. 1909, 82' x 20', Baker-Newman top; B, last rebt. 1903, 75' x 17'; 8 two-pass stoves (two 90' x 20', six 80' x 18'); 5 steam blowing eng. (50,000 cfm.); 10 water-tube boilers, 2,500 H. P. Machine shop for own use. Coke; local brown hematite ore. 376 beehive coke ovens connected with furnaces.

Product: foundry and forge pig iron, annual cap., 175,000 tons.

WOODWARD IRON CO., Woodward, Ala.

Org. and inc. 1911. Capital stock: com. \$10,000,000; pref. 6 % cum. \$3,000,000.

A. H. Woodward, Ch.; J. H. Woodward, P.; R. H. Banister, V. P.; Herbert E. Smith, A. Sc. & P. A.; D. F. Wilson, T.; J. J. Shannon, A. V. P.

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 & Son.

St. Louis, Hickman, Williams & Co.

Brands: "Vanderbilt" and "Woodward."

Product: basic, foundry, soft foundry, and gray forge pig iron.

Vanderbilt Furnaces, Boyles, Ala.: 2 stacks; No. 1, 75' x 15'9"; blt. 1890; last rebt. 1901; 4 Massicks & Crooke stoves, 57'2" x 16'6"; No. 2, 80' x 19'; blt. 1906-8; f. o. May 5, 1908; 4 Nelson stoves, 85' x 20'; 4 steam blowing eng. (75,000 cfm.); 14 water-tube boilers, 4,700 H. P. Alabama coke; local ore. (Formerly operated by the Birmingham Coal and Iron Co.; acquired by present owners April 1, 1912.) Product: soft foundry and gray forge pig iron, annual cap., 130,000 tons.

Woodward Furnaces, Woodward, Ala.: 3 stacks; No. 1, 90' x 22', blt. 1882-83, rebt. 1913; 5 Foote stoves, 110' x 22'; No. 2, 85' x 20', blt. 1886; rebt. 1907-8; 1 Whitwell stove, 80' x 20'; 4 Foote stoves, 90' x 20'; No. 3, 85' x 20', blt. 1902-5, f. o. June 23, 1905; 5 Whitwell stoves, 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 shops for own use. Product: basic, foundry, and forge pig iron, annual cap., 360,000 tons.

By-product coke plant at Woodward, Ala., consisting of 170 Koppers ovens, by-product recovery plant and benzol plant, annual cap.,

750,000 net tons of coke, 500,000 gallons benzol. Bee-hive coke plant at Woodward, 200 ovens, annual cap., 165,000 net tons. Coke plant at Boyles, 50 bee-hive ovens, annual cap., 20,000 net tons.

Company owns about 51,000 acres coal lands at Dolomite, Mulga, Short Creek, and Blossburg, Ala., annual cap. of mines, 1,750,000 tons.

Also owns about 5,000 acres hard ore lands and several thousand acres of undeveloped brown ore lands, annual cap. of mines, 1,500,000 tons hard ore, 100,000 tons soft ore.

Worcester Steel Foundry Co., see 1908 Directory, p. 235, purchased by Oakley Steel Foundry Co. in 1908; name of latter changed to Millbury Steel Foundry Co. July 1, 1910.

WORTH BROTHERS CO., Widener Bldg., Philadelphia, Pa.

Org. 1881; inc. 1896.

Entire capital stock acquired by Midvale Steel and Ordnance Co., Oct. 13, 1915.

A. C. Dinkey, P.; W. P. Barba, V. P.; W. G. MacFarland, T.; John C. Neale, G. M. S.; at Widener Bldg., Philadelphia. Wm. B. Dickson, Sc.; at 14 Wall St., New York City. R. H. Stevens, C.E.; James M. Milliken, A.; H. I. Schotter, G. M.; N. R. Entekin, S.; at Coatesville, Pa.

Sales offices:

Allentown, Pa., 447 Tilghman St.

Baltimore, 67 South Center St.

Boston, Board of Trade Bldg.

Chicago, Peoples Gas Bldg.

Cincinnati, Union Trust Bldg.

Cleveland, Citizens Bldg.

Milwaukee, Majestic Bldg.

Montreal, Royal Insurance Bldg.

New York, City Investing Bldg. and Hudson Terminal Bldg.

Philadelphia, Commercial Trust Bldg.

San Francisco, Flood Bldg.

St. Louis, Chemical Bldg.

Washington, Colorado Bldg.

Product: basic, forge and foundry pig iron; sheared steel plates, including locomotive fire-box, locomotive, marine and stationary boilers, tank, and structural plates; all sizes of machine flanged and dished heads, machine flanged manholes, saddles, pressed steel manheads, yokes, etc.; lap-welded knobbled charcoal iron boiler tubes; open hearth steel tubes, 1½" to 6" diameter.

Properties: blast furnaces, steel works, charcoal forges, rolling mills and tube works at Coatesville, Pa. The Valley and Viaduct plants are operated by the Coatesville Rolling Mill Co., a subsidiary.

BLAST FURNACES.

Worth Brothers Furnaces, Coatesville: 2 stacks. No. 1, Alice Furnace; blt. 1908-10, f. o. May 10, 1910; 85' x 20' 6". No. 2, Betty Furnace, blt. 1909-11, f. o. Dec. 4, 1912; 85' x 21'. 8 central comb. stoves, 90' x 22'; 6 vertical blowing eng. (3 high, 3 low pressure) 19,200 cfm.; 14 water-tube boilers, 7,000 H. P., furnish steam to plate mill engines in addition to blast furnace power plant. Ore stock yard, cap., 500,000 tons, with 10-ton ore bridge, 184' 3" wide. 1 double-strand Heyl & Patterson casting machine. Coke; foreign and domestic ores. Product: basic, forge and foundry pig iron, annual cap., 350,000 tons. Plan to add a third blast furnace in 1916, 95' x 22', annual cap., 160,000 tons.

STEEL WORKS AND ROLLING MILLS.

Brandywine Rolling Mills, Coatesville:

O. H. Dept.: blt. 1895-96, first steel made June, 1896; 16 B. O. H. fur. (6 40-ton, 10 70-ton); 400-ton metal mixer; 100 gas producers. Fuel, producer gas and oil. Annual cap., 425,000 tons of ingots. Adding 6 B. O. H. fur. (55-ton), annual cap., 210,000 tons. Rolling Mill Dept.: orig. blt. 1881, 8 heat. fur.; 12 soaking pits; 4 plate mills (28" x 90" 2-h., 36" x 114" 3-h., 42" x 132" 3-h., 42" x 152" 3-h.); 25 electric cranes, 14 plate shears, flanging and dishing plant to handle heads to 136" outside diameter, hydraulic press for flanging rectangular plates, irregular heads for marine and locomotive boilers, etc. Fuel, producer gas and coal. Machine shop, electric power and lighting plant. Product: sheared steel plates for all purposes, annual cap., 300,000 tons. Adding 40" blooming mill; 15", 12" and 8" bar mills; a rolled steel wheel dept.; a steel tire dept.; 2 additional hydraulic presses (1,500-ton and 2,500-ton).

Valley Iron Works, Coatesville: orig. blt. 1837, last remod. 1908; 5 heating fur.; 20" 2-h. bar mill; 28" x 72", 22" x 54", 22" x 54" 2-h. plate mills. Fuel, prod. gas and bit. coal. Forge Dept.: blt. 1910; f. o. July 21, 1910; 10 charcoal fires; 1 3-ton steam ham.; make charcoal blooms from scrap (10,000 tons). Product: steel plates and sheets and charcoal iron skelp for boiler tubes, annual cap., 25,000 tons.

Viaduct Iron Works, Coatesville:

Rolling Mill Dept.: blt. 1838; 14 heat. fur.; two 20" 2-h. 2-st. bar mills; one 20" x 50", one 25" x 54", and two 25" x 62" 2-h. plate mills; 4 shears. Fuel, bit. coal. Product: 30,000 tons boiler tube skelp or iron or steel plates or sheets.

Forge: blt. 1898, enl. since; 26 charcoal fires; one 3-ton and 2 helve ham.; make charcoal blooms from scrap. Annual cap., 25,000 tons charcoal blooms.

Tube Works: blt. 1900, enl. since; 6 welding fur.; 1 hot and 2 cold benders. Fuel, coal and prod. gas. Product and annual cap.: 35,000 tons of charcoal iron boiler tubes and O. H. steel tubes.

WROUGHT WASHER MFG. CO., Milwaukee, Wis.

Fred. Dopke, P.; Charles H. Disch, Sc.

Branch office: San Francisco, Cal.

Works at Milwaukee: 1 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.) AND CO., 375 Kent Ave., Brooklyn, N. Y.

Org. and inc., July, 1904. Capital stock: \$200,000.

F. W. Wurster, P. & T.; F. W. Wurster, Jr., Sc.

Brand: "F. W. W. & Co."

Works at Brooklyn: blt. 1890, f. o. 1891; 2 heat. fur. (1 2-d. 1 3-d.); 2 trains (18" 3-h. 2-st. and 10" 3-h. 4-st. bar). Fuel, coal. Axle works with 4 ham. for wagon, truck and automobile axles.

Product: iron and steel merchant bars, concrete reinforcing bars, annual cap., 6,000 tons; axles, 750 tons.

WYOMING SHOVEL WORKS (The), Wyoming, Pa.

Org. 1873, inc. June 29, 1893. Capital stock: com. auth. and issued, \$100,000; pref. auth., \$200,000, issued, \$199,700.

Henry Belin, Jr., P.; at Scranton, Pa. N. G. Robertson, Sc., T., & G. M.; H. H. McKeehan, G. S.; at Wyoming.

New York office: 50 Church St.

Works at Wyoming: 2 2-d. heat. fur.; 2 black sheet mills (20" x 36" and 22" x 30"). Fuel, anth. and bit. coal.

Product: shovels, annual cap., 50,000 dozen; shovel plate and spring steel sheets, 6 to 17 gauge, annual cap., 6,000 tons.

Youngstown Foundry and Machine Co., see 1908 Directory, p. 358, dismantled its open hearth furnace in 1909 and no longer makes steel castings.

YOUNGSTOWN IRON AND STEEL CO., Youngstown, Ohio.

Org. and inc. 1901. Capital stock: com. auth. \$2,200,000, issued \$1,200,000; pref. 7% cum. auth. \$800,000, issued \$600,000.

John O. Pew, P. & G. M.; H. W. Heedy, 1 V. P.; C. A. Cochran, 2 V. P. & Sc.; Mason Evans, T.

Works at Haselton, Ohio: blt. 1901, f. o. Sept. 4, 1901, plate mill added 1910; 72" 3-h. plate mill; 9 28" hot sheet mills with the necessary heat. fur.; 4 cold sheet mills; 3 galvanizing pots. Annual cap., 70,000 tons sheets, 60,000 tons plates, 24,000 tons galvanized sheets.

Works at Lowellville, Ohio: blt. 1914-15; 3 B.O.H. fur. (80-ton); first steel made Sept. 1, 1915; use molten metal from Mary Furnace. Adding 36" 3-h. 1-st. slabbing and 30" 3-h. 2-st. sheet bar, mill; 2 4-hole soaking pits. Annual cap., 185,000 tons ingots, 100,000 tons slabs, 85,000 tons of sheet bars.

Product: black and galvanized steel sheets, blue annealed sheets and plates, red steel plates, steel roofing and fire-proofing; also pressed steel specialties.

Youngstown Iron and Steel Roofing Co., changed its corporate title to Youngstown Iron and Steel Co., Nov. 8, 1910.

YOUNGSTOWN SHEET AND TUBE CO. (The), Stambaugh Bldg. Youngstown, Ohio.

Org. and inc. Nov., 1900. Capital stock: com. auth. \$20,000,000, issued \$14,905,200; pref. 7% cum. auth. and issued \$5,000,000; bonds \$1,865,000.

J. A. Campbell, P.; C. S. Robinson, V. P.; W. E. Manning, Sc. & G. S. M.; Richard Garlick, T.; J. J. Brant, A.; W. C. Reilly, G. S.; E. G. Murray, P. A.; at Youngstown. H. G. Dalton, V. P.; at Western Reserve Bldg., Cleveland, Ohio.

Selling agents:

Atlanta, 1514 Healy Bldg., J. G. Rohrman.

Boston, 120 Franklin St., G. A. Taylor.

Chicago, 1563 McCormick Bldg., L. B. Jenks and F. A. Lathrop.

Dallas, 915 Busch Bldg., H. Greenwood.

Denver, 725 First National Bank Bldg., F. S. Rutherford.

New York, 30 Church St., W. B. Blowers.

Philadelphia, W. B. Blowers.

Pittsburgh, 1625 Oliver Bldg., E. S. Rooney.

St. Louis, 902 Third National Bank Bldg., H. L. Miller.

San Francisco, 604 Mission St., J. H. Gilhuly.

Savannah, Savannah Bank and Trust Bldg., W. W. Brown.

Seattle, 535 Central Bldg., G. F. Thompson.

East Youngstown Plant, Youngstown, Ohio:

Blast Furnaces: 4 stacks, 88' x 22'; Furnaces A and B construction began June 1, 1907; C, Sept. 10, 1909; D, June 11, 1912. Furnace A blown in Nov. 2, 1908; B, Nov. 22, 1908; C, Aug. 16, 1910; D, Sept. 8, 1913; 16 Kennedy centre-combustion hot-blast stoves, 100' x 22'; 4 steam blowing eng. (192,000 cfm.); and 1 turbo blower (40,000 cfm.); 34 Rust water-tube boilers, 17,068 H. P. Coke; Lake ore. Molten metal is delivered to hot metal mixers or a 4-strand Uehling casting machine; 4 slag gran. pits with an annual cap. of 580,000 tons. Foundry and machine shop for own use. Product: Bessemer, basic and forge pig iron, annual cap., 720,000 tons.

Plan to add in 1916 a fifth stack, 88' x 22', annual cap., 182,500 tons.

Bessemer Dept.: blt. 1905-06; f. o. Aug. 22, 1906; 2 12-ton converters; 5 cupolas; 2 300-ton metal mixers. Annual cap., 720,000 tons ingots.

O. H. Dept.: construction begun Nov., 1911, completed and f. o. May 1, 1913; 6 100-ton B. O. H. fur., annual cap. 360,000 tons. Adding 3 B. O. H. fur. (100-ton); 1 mixer (1,300-ton); to be completed about May 1, 1916, which will increase annual cap. to 540,000 tons.

Rolling Mill Dept.: blt. 1901-02; enl. 1905-06; puddle and sheet mills f. o. Feb., 1902; skelp mills, Dec., 1902; blooming mill, Aug. 22, 1906; sheet bar mill, Sept. 20, 1906; and universal mill, Sept. 30, 1906; 23 double puddling fur., 2 busheling fur.; 11 4-d. heat fur.; 2 Morgan and 1 Laughlin cont. fur.; 12 4-hole soaking pits; 44" 2-h. 1-st., 40" 2-h. 1-st. blooming; 18" 2-h. 10-st. cont. billet; 18" 2-h. 8-st. cont. bar; 10" 2-h. 16-st. cont. rod mill; 16" 2-h. 3-st. and 10" 2-h. 10-st. skelp; two 20" 3-h. 1-st. muck mills; 18" 3-h. 2-st. bar mill; 42" 2-h. 1-st. comb. sheared and universal plate mill, universal plates 10" to 42½" wide, 8 gauge to ¾"; sheared plates 10" to 64½" wide, ¼" to ¾" gauge; 4 intermittent, 1 cont. gas heat. fur.; 15 black sheet mills, blt. 1902-09, f. o. Feb., 1902 (6 26", 9 28"), sheets 10 to 30 gauge, 24" to 48" wide; 1 pair and sheet fur., 14 comb. stoker-fired coal heat. fur.; 6 single st. cold mills (1 40", 2 42", 2 44", 1 56"); 8 box prod. gas annealing fur.; 4 double plunger pickling machines; 8 steam ham. (600 to 5,000-lb.); 10 galvanizing pots and 4 electro-galvanizing machines for galvanizing sheets, wire and nails. Foundry and machine shop for own use. Fuel, nat. and prod. gas, coal and coke.

Tube Mills: 6 butt-weld and 4 lap-weld tube mills making butt-weld pipe ¾" to 3" and lap-weld pipe 1½" to 20". Annual cap.,

450,000 tons of wrought iron and steel pipe. Pipe galvanizing dept. with 4 galvanizing pots, annual cap., 110,000 tons; and tar dipping dept. for coating all sizes of pipe.

Product: billets, sheet bars, bars, skelp, muck bar, scrap bar, wire rods, universal and sheared plates for skelp only, black, galvanized, flat, corrugated, standing seam, and V crimped, iron and steel sheets. Annual cap., 43,800 tons muck bar; 1,082,700 tons blooms, billets and sheet bars; 230,000 tons skelp; 154,000 tons plates; 86,000 tons black sheets, 65,000 tons galvanized sheets, and 125,000 tons wire rods.

Rod and Wire Department, Struthers, Ohio: orig. blt. 1902; 1 Morgan cont. billet heat. fur.; 3 gas prod.; cont. rod mill with 12" 2-h. 2-st. and 10" 2-h. 4-st. roughing, 10" 2-h. 10-st. finishing; 202 wire drawing blocks; 182 wire nail machines; barbed wire and woven fence machines. Fuel, coal and prod. gas. Product: wire rods, wire, barbed wire, field fence and galvanized wire, wire nails. Annual cap., 125,000 tons rods, 135,000 net tons drawn wire, 20,000 tons barbed wire, 9,000,000 rods square mesh field fence, 63,000 tons galvanized wire, 1,500,000 kegs nails (100 lb. kegs). Adding (construction began, Oct. 5, 1915); 2 Morgan cont. billet heat. fur.; one 9" 2-h. 12-st. and one 12" 2-h. 9-st. Morgan cont. bar mills, estimated annual cap., 200,000 tons.

Conduit Plant, Struthers, Ohio: blt. 1912-13; Rigid Dept. for manufacture of black enamel and electro-galvanized conduit, annual cap., 12,500 tons: Flexible Dept. for manufacture of armored flexible conduit and armored hose, annual cap., 1,000 tons.

By-product coke plant under construction: Contract placed in May, 1915 for 204 Koppers by-product coke ovens to be erected on 40 acre site in Struthers near the blast furnaces, annual cap., about 750,000 net tons. Benzol plant under construction, to be completed about June 1, 1916, annual cap., 1,875,000 gals. benzol, toluol, etc.

The company owns about 5,000 acres of undeveloped coal lands in Greene County, Pa.

The company owns three-fifths of the capital stock of the Crete Mining Company which owns 260 acres of iron ore land and operates the Albany, Utica and Troy mines on the Mesabi range, annual cap., 1,000,000 tons of iron ore. Also owns two-thirds of the capital stock of the Balkan Mining Co., which operates the Balkan and Belgrade mines on the Mesabi Range; and an interest in the Volunteer Mining Co. which operates the Palmer mine. Also an interest in the Carbon Limestone Co.

Youngstown Steel Co., merged in Brier Hill Steel Co., Feb. 1, 1912.

ZENITH FURNACE CO., foot of 58th Ave., West Duluth, Minn.

Org. 1902; inc. May 15, 1902. Capital stock: com. auth., \$1,500,000; issued, \$1,175,400; bonds, \$110,000.

C. P. Wheeler, P.; at Chicago. W. B. Castle, V. P. & G. M.; Oscar Mitchell, Sc.; C. W. Andrews, T.; A. E. Bennett, A. & P. A.; F. C. Harris, G. S.; at West Duluth.

Selling agents: Pickands, Brown & Co., Chicago.

Brand: "Zenith."

Zenith Furnace at Duluth: 1 stack, blt. 1889-90, last rebt. 1914, 77½' x 16½'; 6 stoves (1 2-pass Foote; 3 3-pass Gordon-Stroebel; 2 2-pass side combustion stoves, 80' x 20'); 3 steam blowing eng. (24,100 cfm.); 8 water-tube boilers, 1,200 H. P. By-product coke; Lake ore.

By-product coke plant, 50 Otto-Hoffmann ovens; annual cap., 90,000 net tons coke. Benzol plant, blt. 1915, first in operation, June 1, 1915.

Product: Bessemer, malleable and foundry pig iron. Annual cap., 80,000 tons.

ZIMMERMAN STEEL CO., Bettendorf, Iowa.

Org. 1895; inc., June, 1914. Capital stock: com., \$300,000; bonds, \$50,000.

Wm. C. F. Zimmerman, P.; F. W. Zimmerman, V. P.; H. V. McCluskey, Sc.; H. L. Zimmerman, T.

Works at Bettendorf: former works at Lone Tree, Iowa, removed to Bettendorf, 1915. Two 3-ton Zimmerman converters; 2 cupolas. Fuel, oil and coke. Machine shop for jobbing. Gray iron and brass foundry.

Product: stump pullers, wagon and stock scales, etc.; steel castings (all titanium treated) for own use and for sale. Annual cap., 27,000 tons of steel castings.

Zug Iron and Steel Co., see 1908 Directory, p. 299, formerly operated Sable Iron Works, 13th and Etna Sts., Pittsburgh; plant idle and abandoned but not dismantled.

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 1911 are designated by the insertion, in parentheses after the name of the company, of the date when last operated.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
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UNITED STATES.

ALABAMA.

Alabama City.

Gulf States Steel Co.	1	100,000	b.
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Anniston.

The Woodstock I. & S. Corp.	2	175,000	A., F.
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Attalla.

Eagle Furnace Co. (1911)	1*	12,000	A.
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Battelle.

Battelle Furnace (1906)	1	75,000	A.
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Bessemer.

Tenn. C., I. & R. R. Co.	5	270,800	A., F., H., I.
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Birmingham.

Sloss-Sheffield S. & I. Co.	4	360,000	A., F.
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Tenn. C., I. & R. R. Co.	1	78,200	A., B., F.
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Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Boyles.			
Woodward Iron Co. (Vander- bilt)	2	130,000	A., F.
Ensley.			
Tenn. C., I. & R. R. Co. . . .	6	737,100 .	A., B., F., H., I.
Florence.			
Sloss-Sheffield S. & I. Co. . .	1	85,000	A., F.
Gadsden.			
The Alabama Co. (Etowah Furnaces)	2	200,000 .	A., F.
Holt.			
Central I. & C. Co.	1	100,000 .	A.
Ironaton.			
The Alabama Co. (Clifton Furnaces)	2	100,000	A.
Jenifer.			
Jenifer I. & C. Co. (1903) . .	1	50,000	A., F.
Oxmoor.			
Tenn. C., I. & R. R. Co. . . .	2†	56,400	A., B., F.
Rock Run.			
The Bass Foundry & Machine Co.	1*	18,000	A.
Sheffield.			
Sheffield Coal & Iron Co. (1910)	3	210,000	A., F.
Sloss-Sheffield S. & I. Co. . .	1	85,000	A., F.
(building)	1	98,500	
Shelby.			
Shelby Iron Co.	2*	50,000	A.
Talladega.			
Northern Alabama C. I. & Ry. Co. (1903)	1	70,000	A.
Thomas.			
Republic I. & S. Co.	3	315,000 .	A., F.
Trussville.			
The Michigan Trust Co. (1910)	1	70,000	A., B., F.
Woodward.			
Woodward Iron Co.	3	360,000 .	A., B., F.
COLORADO.			
Pueblo.			
Colorado Fuel & Iron Co. . . .	6	625,000 .	a., b., c., h., i.
CONNECTICUT.			
East Canaan.			
Barnum-Richardson Co. . . .	2*	10,000	A.
Lime Rock.			
Barnum-Richardson Co. . . .	1*	5,000	A.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
GEORGIA.			
Cedartown.			
Cedartown Iron Co. (1910) . . .	1*	20,000	A.
Rising Fawn.			
Georgia Steel Co. (1907) . . .	1	72,000	A.
Rome.			
The Michigan Trust Co. (1911)	1	24,000	A., F.
Tallapoosa.			
Blue Ridge Iron Co.	1*	13,500	A., E.
ILLINOIS.			
Chicago.			
Illinois Steel Co. (1910) . . .	2	96,600	c., h., i.
Joliet.			
Illinois Steel Co..	4	638,000 .	c.
South Chicago.			
By-Products Coke Corpn. . . .	2	250,000 .	A., B., E.
Illinois Steel Co..	11	1,897,500 .	B., C., G., H., I.
Iroquois Iron Co.	4	460,000 .	A., B., E.
Wisconsin Steel Co.	3	500,000 .	C., E.
INDIANA.			
Gary.			
Illinois Steel Co.	8	1,311,200 .	B.
Indiana Harbor.			
Inland Steel Co..	2	300,000 .	A., B.
KENTUCKY.			
Ashland.			
Ashland Iron & Mining Co.. . .	2	150,000	A., B., E., G.
Norton Iron Works	1	70,000	A., C., E.
Hematite.			
Hillman Land & Iron Co.. . .	1*	3,000	A.
Middlesboro.			
Virginia I., C. & Coke Co. . . .	2	110,000	A., F.
MARYLAND.			
Muirkirk.			
The Muirkirk Iron Corp. . . .	1*	6,000	A.
Sparrow's Point.			
Maryland Steel Co.	4	657,000 .	c., h.
MASSACHUSETTS.			
Cheshire.			
Richmond Iron Works	1*	5,000	A.
Richmond Furnace.			
Richmond Iron Works	1*	5,000	A.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
MICHIGAN.			
Boyne City.			
Charcoal Iron Co. of America .	1*	29,000	A., E.
Cadillac.			
Mitchell-Diggins Iron Co. . . .	1*	40,000	A., E.
Chocolay.			
Charcoal Iron Co. of America (long idle)	1*	25,000	A., E.
Detroit.			
Detroit Furnace Co.	1	30,000	A., B., E.
East Jordan.			
East Jordan Furnace Co. . . .	1*	20,000	A.
Elk Rapids.			
Charcoal Iron Co. of America .	1*	35,000	A., E.
Gladstone.			
Cleveland-Cliffs Iron Co. . . .	1*	38,000	A.
Mancelona.			
Antrim Iron Co.	1*	30,000	A., E.
Manistique.			
Charcoal Iron Co. of America .	1*	36,000	A., E.
Marquette.			
Pioneer Iron Co.	1*	42,000	A., D., E.
Newberry.			
Charcoal Iron Co. of America .	1*	29,000	A., E.
River Rouge.			
Detroit I. & S. Co.	2	240,000	A., B., C., E.
Wells.			
Stephenson Charcoal Iron Co. .	1*	20,000	A.
MINNESOTA.			
Duluth.			
Minnesota Steel Co.	1	162,500*	b.
(building)	1	162,500*	
Zenith Furnace Co.	1	80,000	A., C., E.
MISSISSIPPI.			
Winborn.			
Memphis Mining & Mfg. Co. .	1*	3,500	D.
MISSOURI.			
Sligo.			
Sligo Furnace Co.	1*	20,000	A., B., E.
South St. Louis.			
State Nat'l. Bank of St. Louis. (Missouri Furnace) (1911)	1	45,000	A.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
NEW JERSEY.			
Oxford.			
Empire S. & I. Co.	1	80,000	A., B., F.
Stanhope.			
Musconetcong Iron Works . .	1	50,000	A.
Wharton.			
Wharton Steel Co. (1911) . . .	3	300,000,	A., B., F.
NEW YORK.			
Buffalo.			
The Buffalo Union Furnace Co.	3	350,000	A., C., E.
Rogers-Brown Iron Co.	4	500,000	A., B., C., E.
Donner Steel Co., Inc.	1	150,000	b.
Wickwire Steel Co.	2	250,000	A., B., E.
Charlotte.			
Genesee Furnace Co.	1	100,000 ,	A., F.
Copake Falls.			
W. A. Miles (1903)	1*	5,000	A.
Lackawanna.			
Lackawanna Steel Co.	7	1,080,000 ,	b., c.
North Tonawanda.			
Tonawanda I. & S. Co.	2	180,000	A., E., F.
Port Henry.			
Northern Iron Co.	1	75,000	A., B., C., E.
Standish.			
Northern Iron Co.	1	69,000	C., D., E.
Troy.			
The American Steel & Wire Co.	3	123,000	c.
(Breaker Island Furnaces, idle since 1897)		2882	
Burden Iron Co. (1907)	1	90,000	F.
OHIO.			
Bellaire.			
Carnegie Steel Co.	2	276,000 ,	c.
Canal Dover.			
The Penn Iron & Coal Co. . .	1	146,000 ,	B., C., E.
Canton.			
United Furnace Co. (building).	1	160,000	
Cleveland.			
The American Steel & Wire Co.	5	825,000 ,	b., c.
Cleveland Furnace Co.	2	250,000 ,	A., B., E.
The River Furnace Co.	2	275,000 ,	A., B., C., E.
(building)	2	360,000 ,	
The Upson Nut Co.	1	82,125	b.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Columbus.			
Carnegie Steel Co.	2	181,000	c.
The Columbus I. & S. Co.	2	175,000	A., B., C., E.
Culbertson.			
The Marting I. & S. Co. (Law- rence)	1	72,000	B.
Girard.			
The A. M. Byers Co. of Ohio	1	100,000.	A., F.
Hamilton.			
The Miami I. & S. Co. (1910)	1	100,000.	A., B., E.
Hanging Rock.			
The Hanging Rock Iron Co.	1	50,000	A., B., E.
Hubbard.			
The Andrews & Hitchcock Iron Co.	2	270,000.	A., C., E., F.
Ironton.			
Belfont Iron Works Co.	1	60,000	A., C., F.
The Kelly Nail & Iron Co.	1	50,000	C.
The Marting I. & S. Co. (Alice and Blanche)	2†	109,000	A., C., E.
The Marting I. & S. Co. (Iron- ton)	1	80,000	A., E.
The Union Furnace Co.	1	50,000	B., E.
Jackson.			
Globe Iron Co.	1	48,000	G.
The Jackson I. & S. Co.	1	36,000	G.
Star Furnace Co.	1	60,000	A., G.
Leetonia.			
McKeefrey Iron Co.	1	120,000 .	A., B., C., E., F.
United I. & S. Co.	1	125,000 .	A., E.
Lorain.			
The National Tube Co. of Ohio	5	817,000 .	b., c.
Lowellville.			
The Ohio I. & S. Co.	1	150,000 .	A., B., C., F.
-Martins Ferry.			
Wheeling S. & I. Co.	1	100,000 .	c.
-Mingo Junction.			
Carnegie Steel Co.	3	532,000 .	c.
New Straitsville.			
The Bessie Furnace Co.	1	18,000	G.
Niles.			
Carnegie Steel Co.	1	96,000	c.
Oak Hill.			
The Jefferson Iron Co.	1*	3,500	A.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Steubenville.			
Carnegie Steel Co. (1907) . . .	1	65,000	c.
La Belle Iron Works	2	300,000	A., B.
Struthers.			
The Struthers Furnace Co. . . .	1	170,000	B., E.
Toledo.			
The Toledo Furnace Co.	2	300,000	A., B., C., E.
Wellston.			
Wellston S. & I. Co.	3	120,000	A., E.
Youngstown.			
The Brier Hill Steel Co.	2	311,000	B., C., E.
Carnegie Steel Co. (Ohio Works)	6	1,052,000	b., c.
Republic I. & S. Co.	5	725,000	b., c.
The Youngstown Sheet & Tube Co.	4	720,000	B., c., f.
Zanesville.			
Carnegie Steel Co. (1910) . . .	1	50,000	c., g.

OREGON.

Oswego.			
The Oregon I. & S. Co. (1894). .	1*	15,000	A.

PENNSYLVANIA.

Alburtis.			
The Thomas Iron Co. (Lock Ridge)	2	42,000	A., B., E., F.
Allentown.			
Allentown Iron Mfg. Co.	2*	3,000	A.
Bessemer.			
Carnegie Steel Co. (Edgar Thomson)	11	1,860,000	b., c.
Birdsboro.			
Brooke (The E. & G.) Iron Co. .	1	85,000	A., B., F.
Catasauqua.			
Crane Iron Works	2	140,000	A., B., C., D.
Chester.			
Delaware River Steel Co. . . .	1	70,000	A., B., C., E.
Clairton.			
Carnegie Steel Co.	3	459,000	b.
Coatesville.			
Worth Brothers Co.	2	350,000	a., b., f.
Cornwall.			
Lackawanna I. & S. Co.	3	115,000	A., C.
Curtin.			
Eagle Iron Co.	1*	2,400	A.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Donora.			
The American Steel & Wire Co.	2	350,000	b.
Dubois.			
Adrian Furnace Co.	1	90,000	A.
Dunbar.			
American Manganese Mfg. Co.	2	150,000	A., F., H., I.
Earlston.			
Thropp, Jos. E.	1	95,000	A., F.
Easton.			
The Thomas Iron Co. (Key- stone, 1911)	1	36,000	A., B., E., F.
Emaus.			
Reading Iron Co.	1	70,000	A., F.
Emporium.			
Emporium Iron Co.	1	45,000	A., F.
Erie.			
Perry Iron Co.	1	109,500	A., C., E.
Etna.			
Carnegie Steel Co. (Isabella Furnaces)	3	441,000	a., b., c., d., f., g., h., i.
Farrell.			
Carnegie Steel Co.	3	406,000	b.
Harrisburg.			
Central I. & S. Co.	2	105,000	A., B., C., E., F.
The Pennsylvania Steel Co. . .	1	55,000	c., d., I.
Hokendauqua.			
The Thomas Iron Co.	2	175,000	A., B., E., F.
Hellertown.			
The Thomas Iron Co. (Saucon)	2	55,000	A., B., E., F.
Johnstown.			
Cambria Steel Co.	8	1,365,000	a., b., c., d., h., i.
Josephine.			
Josephine Furnace & Coke Co.	2	280,000	A., B., C., E., F.
Kittanning.			
Kittanning Iron & Steel Manu- facturing Co., (Rebecca Fur- nace)	1	100,000	A., B., E., F.
Lebanon.			
Lackawanna I. & S. Co. . . .	2	130,000	A.
Lebanon Blast Furnace Co. . .	1	24,000	A., C., D.
The Pennsylvania Steel Co. . .	2	190,000	c., D.
Leesport.			
Leesport Furnace Co.	1	18,000	A., F.
Macungie.			
Empire S. & I. Co.	1	25,000	A., C., F.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
McKeesport.			
National Tube Co. (Monongahela)	4	660,000	c.
Midland.			
Pittsburgh Crucible Steel Co. . .	1	180,000	B
Milesburg.			
McCoy-Linn Iron Co.	1*	1,800	A., F.
Monessen.			
Pittsburgh Steel Co.	2	360,000	B.
Neville Island.			
Carnegie Steel Co.	1	159,000	b.
New Castle.			
Carnegie Steel Co.	4	603,000	c.
Republic I. & S. Co.	1	120,000	c.
Newport.			
Juniata Furnace & Fdry. Co. . .	1	36,000	A., I.
Palmerton.			
The New Jersey Zinc Co. . . .	2	60,000	I.
Parryville.			
Carbon I. & S. Co., Ltd. . . .	1	40,000	A., C., D.
Pittsburgh.			
The American Steel & Wire Co.	2	175,000	b., c.
Carnegie Steel Co. (Edith and Lucy Furnaces)	3	249,000	a., b., c., d., f., g., h., i.
Clinton I. & S. Co.	1	110,000	A., B., C., E., F.
Jones & Laughlin Steel Co. . .	6	1,010,000	b., c.
Pottstown.			
Glasgow Iron Co. (1910) . . .	1	50,000	
The Eastern Steel Co. (Warwick Furnaces)	3	300,000	A., B., C., D., F.
Punxsutawney.			
Punxsutawney Furnace Co. . .	1	75,000	A., F.
Rankin.			
Carnegie Steel Co. (Carrie Furnaces)	7	1,101,000	b.
Reading.			
Reading Iron Co.	1	110,000	A., f.
Riddlesburg.			
Colonial Iron Co.	1	75,000	A.
Robesonia.			
The Robesonia Iron Co., Ltd. .	1	50,000	D.
Saxton.			
Thropp, Joseph E.	2	170,000	A., B., F.
Scottdale.			
Scottdale Furnace Co.	1	110,000	A., C., E., F.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Sharon.			
Carnegie Steel Co.	1	95,000	b.
Republic I. & S. Co.	1	50,000	a., b., c., f.
Stewart Iron Co., Ltd.	1	100,000	A., B., C., D., F.
Sharpsville.			
Claire Furnace Co.	1	85,000	A., C., E.
The Sharpsville Furnace Co. . .	1	60,000	A., C., E.
The Shenango Furnace Co. . . .	3	325,000	B., C., E.
Valley Mould & Iron Co.	1	90,000	B., c.
Sheridan.			
Berkshire Iron Works	1	43,000	A.
South Bethlehem.			
Bethlehem Steel Co.	7	1,000,000	A., B., C.
South Duquesne.			
Carnegie Steel Co. (Duquesne Furnaces)	6	1,035,000	b.
Steelton.			
The Pennsylvania Steel Co. . . .	5	610,000	B., c., D., I.
Swedeland.			
Alan Wood I. & S. Co.	2	275,000	B., f.
Temple.			
Delaware Steel & Ordnance Co. .	1	50,000	A., F.
Topton.			
Empire S. & I. Co.	1	36,000	A., F.
West Middlesex.			
The Ella Furnace Co.	1	80,000	A., B., C., E.
United I. & S. Co.	1	100,000	B., C.
Woodlawn.			
Jones & Laughlin Steel Co. . .	4	728,000	b.
Wyebrooke.			
Potts, William M. (1894)	1*	5,400	A.

TENNESSEE.

Allens Creek.			
Bon Air Coal & Iron Co.	2	72,000	A., G.
Carlisle.			
Dover Iron Co.	1*	5,000	A.
Chattanooga.			
Chattanooga Iron & Coal Corp. .	1	75,000	A., F.
Clarksville.			
Red River Furnace Co.	1	50,000	A.
Cumberland Furnace.			
Warner Iron Co.	1	30,000	A.
Dayton.			
The Dayton Coal & Iron Co. . .	2	100,000	A., F.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Embreeville.			
Embree Iron Co. (1909) . . .	1	50,000	A., D., E., F.
Goodrich.			
Standard Iron Co.	1	24,000	A.
Johnson City.			
The Cranberry Furnace Co. .	1	36,000	D.
La Follette.			
La Follette Coal & Iron Co..	1	60,000	A., F.
Napier.			
Napier Iron Works.	1	36,500	A.
Rockdale.			
Gray, J. J., Jr. (Rockdale Fur- nace).	1	12,000	J.
Rockwood.			
Roane Iron Co.	2	140,000	A., F.
South Pittsburg.			
Tenn. C., I. & R. R. Co. (long idle).	2†	52,900	A., F.
TEXAS. 36			
New Birmingham.			
New Birmingham Development Co. (long idle)	1*	15,000	A.
Rusk.			
Texas (State of) (1909) . . .	1	36,000	A., F.
VIRGINIA.			
Big Stone Gap.			
Williams, L. M. (Union Furnace) (1907)	1	50,000	A.
Bristol.			
Virginia I., C. & Coke Co. (1908)	1	50,000	A., B., F.
Buena Vista.			
Alleghany Ore & Iron Co. . .	1	36,000	A., B.
Covington.			
The Low Moor Iron Co. of Va.	1	50,000	A.
Foster Falls.			
Virginia I., C. & Coke Co. . .	1*	3,000	A.
Glen Wilton.			
Princess Furnace Co., Inc. . .	1	36,000	A.
Goshen.			
The Goshen Iron Co. (1910) .	1	50,000	A., B., F.
Graham.			
Virginia I., C. & Coke Co. (1904)	1	40,000	A., B.
Iron Gate.			
Alleghany Ore & Iron Co. . .	1	30,000	A., B.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
Ivanhoe.			
Carter Iron Co.	1	25,000	A., B., C.
Liberty Furnace.			
Shenandoah I. & C. Co. (1906)	1*	25,000	A.
Low Moor.			
The Low Moor Iron Co. of Va.	2	130,000	A.
Lynchburg.			
Oriskany Ore & Iron Corp. . .	1	50,000	A., F.
Max Meadows.			
Virginia I., C. & Coke Co. . .	1	60,000	A., B., F.
Pulaski.			
Pulaski Iron Co.	1	70,000	A.
Virginia I., C. & Coke Co. . .	1	50,000	A., F.
Radford.			
Virginia I., C. & Coke Co. . .	1	75,000	A., F.
Roanoke.			
Flickwir, David W. (West End Furnace)	1	48,000	A., B., F.
Virginia I., C. & Coke Co. . .	2	100,000	A., B., F.
Shenandoah.			
Alleghany Ore & Iron Co. (1907)	1	36,000	A., B., F.

WEST VIRGINIA.

*Benwood.			
National Tube Co. (Riverside)	2	233,000	c.
Wheeling.			
Wheeling S. & I. Co.:			
Belmont Furnace (1910) . .	1	75,000	c., f.
Top Furnace	1	100,000	c.

WISCONSIN.

Ashland.			
Charcoal Iron Co. of America .	1*	45,000	A., E.
Mayville.			
The Northwestern Iron Co. .	2	180,000	A., C., E.
Milwaukee.			
Illinois Steel Co.	2	103,400	A., B., C., E., F.
The Thomas Furnace Co. . .	1	90,000	A., C., D., E.
Phelps.			
W. R. Carr & Co. (Twinlake Furnace)	1*	3,000	A.
Spring Valley.			
Spring Valley Iron & Ore Co. (1910)	1	35,000	A., C., E.

Location and Operating Company.	No. of stacks.	Annual capacity. Gross tons.	Products.
CANADA.			
ONTARIO.			
Deseronto.			
Standard Iron Co., Ltd. . . .	1*	20,000	A., E.
Hamilton.			
The Steel Co. of Canada, Ltd. .	2	200,000	A., b., E.
Midland.			
Canada Iron Foundries, Ltd. .	2	125,000	A., c., E.
Parry Sound.			
Standard Iron Co., Ltd. . . .	1*	36,000	A.
Port Arthur.			
Atikokan Iron Co., Ltd. . . .	1	45,000	A.
Port Colborne.			
Canadian Furnace Co., Ltd. .	1	125,000	A., C., E.
Sault Ste. Marie.			
Algoma Steel Corp.	3	350,000	b., c.
NOVA SCOTIA.			
Londonderry.			
The Londonderry I. & M. 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.	1	90,000	A., b.

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 ¹	A	a
Basic open-hearth	B ¹	B	b
Bessemer	C	C	c
Crucible	D	D	d
Electric.	E	E	e
Miscellaneous	F	F	f

Location and Operating Company.	Annual capacity. Gross tons.	Products.
UNITED STATES.		
ALABAMA.		
Alabama City.		
Gulf States Steel Co.	288,000	b.
Ensley.		
Tennessee Coal, Iron and Railroad Co.	700,000	b.*
CALIFORNIA.		
Los Angeles.		
Southern California Iron and Steel Co.	30,000	b.
San Francisco.		
Judson Manufacturing Co.	15,000	b.
South San Francisco.		
Pacific Coast Steel Co.	45,000	b.
COLORADO.		
Pueblo.		
Colorado Fuel & Iron Co.	1,140,000	b., c.
CONNECTICUT.		
Bridgeport.		
American Tube & Stamping Co.	80,000	b.
The Farist Steel Co.	1,800	d.
Collinsville.		
The Collins Co.	4,000	d., f.

* Bessemer converters used for duplexing only.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
DELAWARE.		
Wilmington.		
Delaware Steel & Ordnance Co. . . .	150,000	a. b.
DISTRICT OF COLUMBIA.		
Washington.		
Washington Steel & Ordnance Co. . .	13,200	b., e.
GEORGIA.		
Atlanta.		
Atlantic Steel Co.	90,000	b.
ILLINOIS.		
Alton.		
Laclede Steel Co.	75,000	b.
Chicago Heights.		
Columbia Tool Steel Co.	5,400	d.
Railway Steel-Spring Co.	60,000	b.
Granite City.		
National Enameling & Stamping Co. .	120,000	b.
Joliet.		
Illinois Steel Co.	690,000	c.
South Chicago.		
Grand Crossing Tack Co.	50,000	b.
Illinois Steel Co.	2,070,800	a., b., c*, e.
Wisconsin Steel Co.	500,000	c.
INDIANA.		
Gary.		
Illinois Steel Co.	2,160,000	b.
Indiana Harbor.		
Inland Steel Co.	1,000,000	b.
Kokomo.		
Kokomo Steel & Wire Co.	95,000	b.
KENTUCKY.		
Ashland.		
Ashland Steel Co., Inc.	180,000	c.
Newport.		
The Andrews Steel Co.	180,000	b.
MAINE.		
South Portland.		
Bancroft & Martin Rolling Mills Co. .	12,000	b.
MARYLAND.		
Baltimore.		
Hess Steel Corp. (building)	10,000	e.

* Bessemer converters also used for duplexing.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Cumberland.		
N. & G. Taylor Co.	35,000	b.
Sparrows Point.		
Maryland Steel Co.	<u>702,000</u>	b., c*.
MASSACHUSETTS.		
Worcester.		
The American Steel & Wire Co. . . .	160,000	a., b., e.
West Wareham.		
Tremont Nail Co.	30,000	b.
MICHIGAN.		
Detroit.		
John A. Crowley Co.	8,000	e.
Kalamazoo.		
Harrow Spring Co. (building)	7,000	e.
MINNESOTA.		
Duluth.		
Minnesota Steel Co.	500,000	b.
NEW JERSEY.		
Bridgeton.		
The Hess Steel Corp.	1,200	D., E.
Chrome.		
Chrome Steel Works	32,500	a., d.
Harrison.		
Crucible Steel Co. of America	59,500	a., b., d., e.
Newark.		
Heller Brothers Co.	1,500	d.
Perth Amboy.		
The C. Pardee Works.	40,000	b.
Rockaway.		
International High Speed Steel Co. (building)		e.
Roebling.		
John A. Roebling's Sons Co.	120,000	a., b.
NEW YORK.		
Buffalo.		
Donner Steel Co., Inc.	160,000	b.
Wickwire Steel Co. (projected) . . .	120,000	b.
Cortland.		
Wickwire Bros., Inc.	40,000	b.
Dunkirk.		
Atlas Crucible Steel Co.	1,900	d.

* Bessemer converters also used for duplexing.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Lackawanna.		
Lackawanna Steel Co.	1,720,000	b., c.*
Lockport.		
Simonds Manufacturing Co.	8,000	d., e.
North Tonawanda.		
Niagara Electric Steel Corp.		E.
Schenectady.		
General Electric Co.	50	e.
Syracuse.		
Crucible Steel Co. of America	15,000	d.
Halcomb Steel Co.	23,400	d., e.
Syracuse Crucible Steel Co. (building)	.....	d.
Watervliet.		
Ludlum Steel Co..	5,000	d., e.
OHIO.		
Bellaire.		
Carnegie Steel Co.	420,000 -	c.
Canton.		
The United Steel Co..	515,000 -	b., e.
Cleveland.		
The American Steel & Wire Co. . . .	935,000 ~	b., c.
The Otis Steel Co.	110,000	a., b.
The River Furnace Co. (building) . .	500,000	b.
The Upson Nut Co..	200,000	b.
Columbia Heights.		
The Central Steel Co.	240,000-	b.
Columbus.		
Carnegie Steel Co.	184,000 ✓	c.
Lorain.		
The National Tube Co. (of Ohio) . . .	946,000 ~	b., c.
Lowellville.		
Youngstown Iron & Steel Co.. . .	185,000 —	b.
Middletown.		
The American Rolling Mill Co. . . .	205,000 x	b.
Mingo Junction.		
Carnegie Steel Co.	600,000 —	c.
Norwalk.		
Crucible Steel Co. of America . . .	26,000 }	b.
Portsmouth.		
Whitaker-Glessner Co.	225,000 ↓	b.
Steubenville.		
La Belle Iron Works	400,000 —	b.

* Bessemer converters also used for duplexing.

† Ingot capacity not stated; see list of steel casting plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Youngstown.		
The Brier Hill Steel Co.	560,000 -	b.
Carnegie Steel Co.	1,334,000 -	b., c.
Republic Iron & Steel Co.	1,300,000 -	b., c.
The Youngstown Sheet & Tube Co. .	1,260,000 -	b., c.

PENNSYLVANIA.

Aliquippa.		
Vulcan Crucible Steel Co.	12,000 -	a., d.
Apollo.		
Apollo Electric Steel Co. (projected) .		b., e.
Bessemer.		
Carnegie Steel Co. (Edgar Thomson Works)	1,850,000 -	b., c.
Brackenridge.		
Allegheny Steel Co.	180,000 -	b.
West Penn Steel Co.	120,000 -	b.
Braeburn.		
Braeburn Steel Co.	11,200 -	d., e.
Bridgeville.		
Universal Rolling Mill Co.	10,200 -	d., e.
Burnham.		
Standard Steel Works Co.	not stated	a., d.
Butler.		
Forged Steel Wheel Co.	220,000 -	b.
Charleroi.		
Hussey-Binns Shovel Co.	4,500 -	d.
Clairton.		
Carnegie Steel Co.	600,000 -	a., b.
Coatesville.		
The Lukens Iron & Steel Co.	561,000 -	a., b.
Worth Brothers Co.	635,000 -	b.
Colona.		
Colonial Steel Co.	47,000 -	b., d.
Corry.		
McInnes Steel Co.	1,000 -	d.
Donora.		
The American Steel & Wire Co. . . .	550,000 -	a., b.
Duquesne.		
Carnegie Steel Co. (Duquesne Works)	1,346,000 -	b.
Erie.		
Erie Forge Co.	42,000 -	a., b.
Farrell.		
Carnegie Steel Co.	480,000 -	b.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Harrisburg.		
Central Iron & Steel Co.	200,000 ^f	b.
Harrisburg Pipe & Pipe Bending Co. .	75,000 [✓]	b.
Ivy Rock.		
Alan Wood Iron & Steel Co.	450,000 [✕]	b.
Johnstown.		
Cambria Steel Co.	1,780,000 [✓]	a., b., c.*
Latrobe.		
Latrobe Electric Steel Co.	10,000 [—]	e.
Railway Steel-Spring Co.	65,000 [—]	a.
Vanadium Alloys Steel Co.	3,900 [—]	d.
Lebanon.		
American Iron & Steel Manufacturing Co.	75,000 [✓]	b., e.
McKeesport.		
Firth-Sterling Steel Co.	12,200 [✓]	b., d., e.
National Tube Co.	689,000 [—]	c.
Midland.		
Pittsburgh Crucible Steel Co.	500,000 [✓]	a., b.
Monessen.		
Page Woven Wire Fence Co.	60,000 [✓]	b.
Pittsburgh Steel Co.	500,000 [✓]	b.
Munhall.		
Carnegie Steel Co. (Homestead Works)	2,441,000 [—]	b.
New Castle.		
Carnegie Steel Co.	700,000 [—]	c.
Pencoyd.		
American Bridge Co.	240,000 [—]	b.
Philadelphia.		
Henry Disston & Sons Iron & Steel Works (Tacony)	13,000 [—]	d.
John Illingworth Steel Co. (Frankford)	3,000 [*]	d.
Midvale Steel Co. (Nictown)	151,190 [✓]	a., b., d.
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 [—]	a., b., e.
Crucible Steel Co. of America:		
Black Diamond Works	127,500 [—]	a., b., d.
Crescent Works	63,000 [—]	b., d.
La Belle Works	29,200 [—]	a., d.

* Bessemer converters also used for duplexing.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Singer-Nimick Works	10,000 ✓	d.
Electro Steel Co.	1,500 ✓	E.
Jones & Laughlin Steel Co.	not stated	a., b., c.*
Metro Steel Co.	7,500 ✓	d.
Pottsville.		
The Eastern Steel Co..	240,000 ✓	b.
Reading.		
The Carpenter Steel Co.	20,000 ×	b., d.
Sharon.		
Carnegie Steel Co.	150,000 =	b.
Sharon Steel Hoop Co.	140,000 >	a., b.
South Bethlehem.		
Bethlehem Steel Co.	1,129,000 ×	a., b.†, d., e.
Steelton.		
The Pennsylvania Steel Co.	1,518,750 †	a., b., c*, d.
Titusville.		
Cyclops Steel Works	2,660 ×	d.
Vandergrift.		
American Sheet & Tin Plate Co.	275,000 —	a., b.
Washington.		
Jessop Steel Co.	10,000 —	d.
West Homestead.		
Mesta Machine Co..	† —	a.
West Leechburg.		
West Leechburg Steel Co.	40,000 ✓	b.
Williamsport.		
Sweets' Steel Co.	20,000 ×	b.
Woodlawn.		
Jones & Laughlin Steel Co.	not stated ×	b.†
RHODE ISLAND.		
Phillipsdale.		
Washburn Wire Co.	37,500	b.
VIRGINIA.		
Richmond.		
Old Dominion Iron & Nail Works Co. (building)	12,000	e.
WASHINGTON.		
Youngstown.		
Pacific Coast Steel Co.	50,000	b.

* Bessemer converters also used for duplexing.

† 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.
WEST VIRGINIA.		
Benwood.		
National Tube Co.	216,000✓	c.
Wheeling Steel & Iron Co..	190,000✓	c.
Charleston.		
Becker Steel Co. of America, Inc. . .	7,000 ✕	d.
Follansbee.		
Follansbee Brothers Co.	90,000	b.
CANADA.		
BRITISH COLUMBIA.		
Port Moody.		
Port Moody Steel Works, Ltd. (building)	25,000	b.
NOVA SCOTIA.		
Sydney.		
Dominion Iron & Steel Co., Ltd. . . .	400,000	b*.
Sydney Mines.		
Nova Scotia Steel & Coal Co., Ltd. . .	140,000	b.
ONTARIO.		
Belleville.		
Tivani Electric Steel Co., Ltd.	400	e.
Collingwood.		
The William Kennedy & Sons, Ltd. .	36,000	a.
Hamilton.		
The Steel Co. of Canada, Ltd.	360,000	b.
Sault Ste. Marie.		
Algoma Steel Corporation	650,000	b., c†.
Welland.		
Canadian Steel Foundries, Ltd. . . .	32,000	b.
Electric Steel & Metals Co., Ltd. . .	8,000	E.
QUEBEC.		
Longueuil.		
Armstrong, Whitworth of Canada, Ltd.	4,050	d., e.

* Bessemer converters used for duplexing only.

† Adding Bessemer converter for duplexing.

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

Location and Operating Company.	Annual capacity. Gross tons.	Products.
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UNITED STATES.

ALABAMA.

Birmingham.

Adams, W.T., Birmingham Steel & Iron Works (long idle, for sale or lease).	2,000	B.
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Ensley.

Tennessee Coal, Iron & Railroad Co. .	5,000	b.
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CALIFORNIA.

Elmhurst (Oakland).

Best Steel Casting Co.	1,800	c.
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Mare Island.

United States Government, Department of the Navy	1,200	c.
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Pittsburg.

Columbia Steel Co.	7,200	B., C.
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Redondo Beach.

Warman Steel Casting Co.	1,800	E.
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South San Francisco.

Enterprise Foundry Co.	150	D.
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Pacific Coast Steel Co.	200	b.
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Stockton.

Monarch Foundry Co. (building). . .	1,800	E.
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Samson Iron Works.	700	D.
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COLORADO.

Pueblo.

Colorado Fuel & Iron Co.	2,000	b.
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Location and Operating Company.	Annual capacity. Gross tons.	Products.
CONNECTICUT.		
Branford.		
Malleable Iron Fittings Co.	2,500	C.
New Haven.		
Safety Insulated Wire & Cable Co. (idle)	10,000	A.
DELAWARE.		
New Castle.		
American Manganese Steel Co.	3,600	C.
The Baldt Steel Co.	12,000	A.
Brylgon Steel Casting Co.	6,000	c.
Deemer Steel Casting Co.	3,000	C.
Wilmington.		
Lobdell Car Wheel Co.	6,000	A.
DISTRICT OF COLUMBIA.		
Washington.		
United States Government, Depart- ment of the Navy	1,750	a., c.
Washington Steel & Ordnance Co. . .	*	b., e.
ILLINOIS.		
Chicago.		
Chicago Steel Foundry Co.	4,000	C., D.
Crane Co.	5,600	c.
Electric Steel Co. (building)	3,000	E.
Link-Belt Co.	800	c.
Pettibone Mulliken Co.	1,200	c.
Chicago Heights.		
American Manganese Steel Co. . . .	12,000	C.
East St. Louis.		
American Steel Foundries	48,000	A., B.
Granite City.		
American Steel Foundries	62,400	B.
Commonwealth Steel Co.	40,000	B.
Joliet.		
Illinois Steel Co.	not stated	c.
Melrose Park.		
The National Malleable Castings Co.	40,000	B.
South Chicago.		
Illinois Steel Co.	6,000	a.
INDIANA.		
Attica.		
National Car Coupler Co.	15,000	A.

* Casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
East Chicago.		
Hubbard Steel Foundry Co.	12,000	A.
Evansville.		
Evansville Tool Works	150	D.
Gary.		
Illinois Steel Co.	7,500	a.
Indiana Harbor.		
American Steel Foundries	33,300	A., E.
Indianapolis.		
Electric Steel Co. of Indiana.	3,600	E.
Lawrenceburg.		
A. D. Cook	45	d.
Montpelier.		
National Steel Casting Co.	6,350	A., B., D.
Muncie.		
Whiteley Steel Co.	2,000	F.
South Bend.		
Oliver Chilled Plow Works.	150	c.
IOWA.		
Bettendorf.		
The Bettendorf Co.	60,000	b.
Zimmerman Steel Co.	27,000	c.
Centerville.		
Hercules Manufacturing Co.	1,000	D.
Charles City.		
Hart-Parr Co.	15,000	b.
Newton.		
The Parsons Co.	2,100	D.
LOUISIANA.		
Mansfield.		
DeSoto Foundry & Machine Co., Ltd. .	350	C.
New Orleans.		
Dibert, Bancroft & Ross	700	C.
MARYLAND.		
Elkton.		
The James F. Powers Foundry Co. . .	500	C.
Frederick.		
The Morris Iron & Steel Co.	2,500	C.
MASSACHUSETTS.		
Boston.		
Eastern Steel Casting Co.	600	D.
Union Steel Casting Co.	300	C.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Chelsea.		
Connolly Steel Casting Co.	150	D.
Millbury.		
Millbury Steel Foundry Co.	500	D.
Neponset.		
The Lundin Steel Casting Co.	300	D.
Pittsfield.		
General Electric Co.	Experimental	e.
Watertown.		
United States Government, Department of the Army	9,200	a., c., d.
West Everett.		
General Electric Co.	11,000	A.
West Lynn.		
General Electric Co.	12,000	A., D.
MICHIGAN.		
Adrian.		
Adrian Steel Casting Co.	150	D.
Bay City.		
Industrial Works	2,500	c.
Buchanan.		
Buchanan Electric Steel Co.	2,700 2,300	E.
Calumet.		
Calumet & Hecla Mining Co.	not stated	d.
Detroit.		
Buhl Malleable Co.	2,000	A.
The Detroit Steel Casting Co.	10,800	A., C.
The Michigan Steel Casting Co.	12,000	C., E.
Monarch Steel Castings Co.	9,000	B., C.
Stock Process Steel Co. (idle)	1,500	C.
Swedish Crucible Steel Co.	1,000	C., D.
Kalamazoo.		
Reed Foundry & Machine Co.	2,000	c.
Monroe.		
Monroe Steel Castings Co.	5,000	D., E.
Muskegon.		
West Michigan Steel Foundry Co.	1,500	C.
Saginaw.		
S. Fair & Son, Inc.	3,600	D., E.
MINNESOTA.		
Minneapolis.		
Minneapolis Crucible Steel Co.	500	D.
Transit Supply Co.	not stated	c.
Western Crucible Steel Casting Co.	800	D.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
St. Paul.		
American Hoist & Derrick Co.	2,500	c.
MISSOURI.		
St. Louis.		
Banner Iron Works.	3,000	C.
St. Louis Frog & Switch Co.	3,500	C.
Scullin Steel Co.	100,000	B.
Warren Steel Casting Co.	500	D.
Wellston.		
St. Louis Steel Foundry Co.	5,000	C.
NEW JERSEY.		
Bayonne.		
Bayonne Steel Casting Co.. . . .	5,000	C.
Chrome.		
Chrome Steel Works	11,500	A., D.
High Bridge.		
Taylor-Wharton Iron & Steel Co.. . .	12,000	C.
Kearney.		
Riverside Steel Casting Co.	1,400	A., D.
Mahwah.		
American Brake Shoe & Foundry Co..	1,950	d.
Newark.		
Hewitt Steel Corp. (The Titan Co.) .	45,000	B.
Phillipsburg.		
Rowland Firth & Son Co., Inc. (idle) .	3,000	B.
Rahway.		
The New Jersey Steel Co. (idle) . . .	16,000	A., C.
NEW YORK.		
Brooklyn.		
United States Government, Department of the Navy	600	c.
Buffalo.		
Atlas Steel Casting Co.	10,000	A.
International Steam Pump Co. . . .	425	c.
Otis Elevator Co..	10,000	e.
Pratt & Letchworth Co..	24,000	A.
Strong Steel Foundry Co.	7,500	A.
W. P. Taylor Co..	600	C.
Colonie (P. O. Watervliet).		
The Delaware & Hudson Co.	450	c.
Depew.		
Gould Coupler Co.	50,000	B.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Lackawanna.		
Lackawanna Steel Co.	1,500	b.
North Tonawanda.		
Niagara Electric Steel Corporation . .	1,500	E.
Olean.		
Clark Brothers Co.	1,500	c.
Schenectady.		
General Electric Co.	1,350	e.
Spuyten Duyvil.		
Isaac G. Johnson & Co.	7,500	A., C.
OHIO.		
Akron.		
The Akron Steel Casting Co.	2,100	B., C.
Alliance.		
American Steel Foundries	48,000	B.
Bucyrus.		
The Bucyrus Steel Casting Co.	15,000	B.
Canton.		
The Canton Steel Foundry Co.	14,000	A.
Cincinnati.		
The Cincinnati Steel Castings Co. . .	1,800	C., D.
The Lunkenheimer Co.	1,520	d., f.
Cleveland.		
Brennan Steel Castings Co.	3,900	C., D.
Cleveland Steel Casting Co.	9,600	A.
Crucible Steel Casting Co.	2,200	D., E.
The Otis Steel Co.	25,000	A., B.
The Standard Steel Castings Co. . . .	6,000	C.
The Wellman-Seaver-Morgan Co. . . .	6,000	B.
The West Steel Casting Co.	2,900	C., D.
Columbus.		
The Bonney-Floyd Co.	12,000	B., C.
The Buckeye Steel Castings Co. . . .	76,000	B., E.
Dayton.		
The Dayton Steel Foundry Co.	7,500	C., E.
The Joyce Cridland Co.	200	D.
Lima.		
The Lima Steel Casting Co.	2,300	C., D.
The Ohio Steel Foundry Co.	15,000	A.
Marion.		
The Marion Steam Shovel Co.	10,000	b.
Middletown.		
The American Rolling Mill Co.	3,000	B.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Sandusky.		
Farrell-Cheek Steel Foundry Co.	4,000	C.
Toledo.		
The Boerder Steel Co.	950	D.
The Toledo Steel Casting Co.	2,500	C.
OREGON.		
Portland.		
Columbia Steel Co.	2,400	C.
Electric Steel Foundry	300	E.
PANAMA CANAL ZONE.		
Balboa.		
The Panama Canal	400	c.
PENNSYLVANIA.		
Ambridge.		
American Bridge Co.	8,600	A.
Avonmore.		
Kiski Steel Casting Co. (idle)	3,000	A.
Birdsboro.		
Birdsboro Steel Foundry & Machine Co.	7,500	A.
Brackenridge.		
Allegheny Steel Co.	7,000	B.
West Penn Steel Co.	*	b.
Braddock.		
Braddock Machine & Manufacturing Co.	4,800	A.
Sterling Steel Foundry Co.	12,000	A.
Burnham.		
Standard Steel Works Co.	not stated	A.
Carlisle.		
The Frog, Switch & Manufacturing Co.	2,000	C.
Chambersburg.		
Chambersburg Engineering Co. (idle)	18,000	a.
Chester.		
Atlantic Steel Casting Co.	3,600	A.
Chester Steel Castings Co.	7,050	A., F.
Empire Foundry & Machine Works (idle)	350	D.
Federal Steel Foundry Co.	12,000	B.
Penn Steel Castings & Machine Co.	20,000	A.
Seaboard Steel Casting Co.	16,000	A.
Crum Lynne.		
Eagan-Rogers Steel & Iron Co.	2,500	C.

* Casting capacity not stated; see list of steel ingot plants.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Darlington.		
Darlington Steel Casting Co.	3,500	C.
Easton.		
Treadwell Engineering Co.	2,000	E.
Erie.		
National Foundry Co.	15,000	A.
Franklin.		
American Steel Foundries	12,000	A.
Glassport.		
Pittsburgh Steel Foundry Co.	24,000	A., B.
Johnstown.		
Cambria Steel Co.	5,000	a, b.
The Lorain Steel Co.	15,000	a.
Kendall Station (P. O. Coraopolis).		
Duquesne Steel Foundry Co.	18,000	A.
Lansdowne.		
Crucible Steel Casting Co.	5,000	C., D.
Lebanon.		
Lebanon Steel Foundry	1,500	E.
McKeesport.		
Fort Pitt Steel Casting Co.	3,600	C.
McKees Rocks.		
Pressed Steel Car Co.	7,200	A.
Midland.		
Pittsburgh Iron & Steel Foundries Co.	41,000	A.
Munhall.		
Carnegie Steel Co.	2,500	b.
New Brighton.		
Damascus Crucible Steel Casting Co. .	750	D., E.
New Kensington.		
Union Spring & Manufacturing Co. . .	4,500	C.
Oil City.		
National Transit Pump & Machine Co.	3,650	c.
Oakmont.		
Kennedy-Stroh Corp.	10,000	A.
Pencoyd.		
American Bridge Co.	3,200	B.
Philadelphia.		
Midvale Steel Co. (Nicetown)	8,700	A., B.
Taylor-Wharton Iron & Steel Co. . .	3,000	C.
United States Government, Department of the Navy	65	d.
Phoenixville.		
The Phoenix Iron Co.	2,500	B.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Pittsburgh.		
American Steel Foundries	6,600	A.
Electro Steel Co.	*	E.
Kennedy-Stroh Corp.	2,500	A.
Jones & Laughlin Steel Co.	not stated	a.
McConway & Torley Co.	25,000	A.
Mackintosh, Hemphill & Co.	12,000	A.
Reliance Steel Casting Co.	6,000	A.
Union Steel Casting Co.	33,000	A.
Reading.		
Reading Iron Co.	2,500	c.
Reading Steel Casting Co.	7,200	C.
Sharon.		
American Steel Foundries	27,000	B.
The National Malleable Castings Co.	55,000	B., E.
South Bethlehem.		
Bethlehem Steel Co.	20,000	A., B.
South Duquesne.		
Carnegie Steel Co. (Duquesne Works)	1,200	b.
Steelton.		
The Pennsylvania Steel Co.	20,000	A.
Thurlow.		
American Steel Foundries	24,000	A.
Vandergrift.		
United Engineering & Foundry Co.	24,000	B.
Verona.		
Verona Steel Castings Co.	8,000	b.
West Homestead.		
Mesta Machine Co.	20,000	A.
Wheatland.		
Sharon Foundry Co.	8,400	A.
RHODE ISLAND.		
Pawtucket.		
Rhode Island Crucible Steel Co.	600	D.
TENNESSEE.		
Chattanooga.		
American Brake Shoe & Foundry Co.	1,950	d.
Ross Meehan Foundries	3,000	C.
Southern Steel Works (idle, for sale)	1,500	C.
TEXAS.		
El Paso.		
El Paso Foundry & Machine Co.	500	C.

* Steel casting capacity not stated ; see list of steel ingot works.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Longview.		
G. A. Kelly Plow Co.	75	d.
UTAH.		
Salt Lake City.		
Salt Lake Iron & Steel Co.	3,600	c.
VIRGINIA.		
Newport News.		
Newport News Shipbuilding & Dry Dock Co.	1,000	c.
Norfolk.		
United States Government, Depart- ment of the Navy	1,000	c.
WASHINGTON.		
Leavenworth.		
Washington Steel & Iron Co. . . . .	.....	d., f.
Puget Sound.		
United States Government, Depart- ment of the Navy	600	c.
Seattle.		
Olympic Steel Works	500	E.
Washington Iron Works.	1,000	E.
Sedro-Woolley.		
Skagit Steel & Iron Works.	1,500	C.
Spokane.		
Union Iron Works.	400	C.
Tacoma.		
The Puget Sound Iron & Steel Works .	2,400	C.
WEST VIRGINIA.		
-Warwood.		
Wheeling Steel Casting Co.	12,000	A.
-Wheeling.		
Wheeling Mold & Foundry Co. . . .	10,000	A.
WISCONSIN.		
Kenosha.		
Arneson Foundry Co.	500	C.
Milwaukee.		
The Bay View Steel Casting Co. . . .	800	D.
Crucible Steel Castings Co.	3,000	E.
The Electric Steel Castings Co.		
(projected)	7,500	E.
The Falk Co.	29,000	A., C.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
Maynard Steel Casting Co.	1,800	D.
Milwaukee Steel Foundry Co.	6,500	C.
National Steel Foundries	10,000	A.
Pelton Steel Co.	3,900	D., E.
Sivyer Steel Casting Co.	7,000	C., D., E.
George H. Smith Steel Casting Co. . .	6,000	C.
Standard Crucible Steel Casting Co. .	3,650	A., D.
Racine.		
Racine Steel Castings Co.	3,600	D., E.
South Milwaukee.		
Bucyrus Co.	7,500	B.
West Allis, (Milwaukee).		
Gerlinger Steel Casting Co.	2,950	D., E.
Wehr Steel Co..	3,300	C., D.

CANADA.

BRITISH COLUMBIA.

Vancouver.		
Vancouver Engineering Works, Ltd. .	900	c.

NOVA SCOTIA.

Dartmouth.		
Williston Steel Foundry Co., Ltd. (building)	not stated	D.
Londonderry.		
Londonderry Iron & Mining Co., Ltd. (idle)	2,500	B.

ONTARIO.

Hamilton.		
Dominion Steel Foundry Co., Ltd. . .	17,000	A., C.
The Steel Co. of Canada, Ltd.	1,500	B.
New Liskeard.		
The Wabi Iron Works, Ltd.	300	E.
Owen Sound.		
The William Kennedy & Sons, Ltd.. .	1,200	c.
Toronto.		
Moffat-Irving Steel Works, Ltd. . . .	960	E.
Welland.		
Canadian Steel Foundries, Ltd.	10,000	B.
Windsor.		
The Swedish Crucible Steel Co. of Canada, Ltd..	2,875	C., D.

Location and Operating Company.	Annual capacity. Gross tons.	Products.
QUEBEC.		
Hull.		
Hull Iron & Steel Foundries, Ltd. . .	10,000	C.
Longue Point.		
Canadian Steel Foundries, Ltd. . . .	18,000	A.
Longueuil.		
Armstrong, Whitworth of Canada, Ltd. *	.....	D.
Montreal.		
Davidson Manufacturing Co., Ltd. .	1,800	E.
Standard Steel Co., Ltd.	1,800	C.
Point St. Charles.		
Canadian Steel Foundries, Ltd. . . .	12,000	A.
Quebec.		
F. X. Drolet Co.	2,000	C.
Sherbrooke.		
Canadian Brakeshoe Co., Ltd.	6,000	E.
Sorel.		
Beauchemin et Fils, Ltd.	1,500	C.

* 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.

Anniston Ordnance Co.

Bessemer.

Tennessee Coal, Iron & R. R. Co.

East Birmingham.

Southern Iron & Commission Co. (Eclipse Rolling Mill).

Ensley.

Tennessee Coal, Iron & R. R. Co.

Fairfield.

The American Steel & Wire Co.

Helena.

Connors-Weyman Steel Co.

Sheffield.

North Alabama Rolling Mill Co. (long idle).

CALIFORNIA.

Emery.

Judson Manufacturing Co.

Los Angeles.

Southern California Iron & Steel Co.

Sacramento.

Southern Pacific Co.

San Francisco.

Rudgear-Merle Co.

South San Francisco.

Pacific Coast Steel Co.

COLORADO.

Pueblo.

Colorado Fuel & Iron Co. (Minnequa Works).

CONNECTICUT.

Bridgeport.

American Tube & Stamping Co.

The Farist Steel Co.

Collinsville.

The Collins Co.

Southington.

The Aetna Nut Co.

DELAWARE.

Wilmington.

Delaware Steel & Ordnance Co. (Diamond State Steel Works).

McCullough Iron Co.

GEORGIA.

Atlanta.

Atlantic Steel Co.

Macon.

Central of Georgia Ry. Co.

ILLINOIS.

Alton.

Laclede Steel Co.

Chicago.

Grand Crossing Tack Co.

The Highland Iron & Steel Co. (West Pullman Works).

Sellers Manufacturing Co. (Mayfair).

Wisconsin Steel Co.

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).

Ottawa.

The Central Steel Co. (idle).

Pullman.

The Pullman Co.

South Chicago.

Grand Crossing Tack Co.

Illinois Steel Co. (South Works).

Wisconsin Steel Co.

Waukegan.

The American Steel & Wire Co.

INDIANA.

Anderson.

The American Steel & Wire Co.

Atlanta.

Atlanta Tin Plate & Sheet Mill. (idle).

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 Corpn.

Gary.

American Sheet & Tin Plate Co. :

Gary Sheet Mill.

Gary Tin Mill (building).

Illinois Steel Co. (Gary Works).

Greencastle.

Austin Lynch. (Plant long idle, for sale).

Indiana Harbor.

Inland Steel Co.

Indianapolis.

Hercules Forge Co.

Kokomo.

Kokomo Steel & Wire Co.

Lawrenceburg.

A. D. Cook.

New Albany.

Ohio Falls Iron Co.

New Castle.

Indiana Rolling Mill Co.

Terre Haute.

The Highland Iron & Steel Co.

Vincennes.

National Rolling Mill Co.

KANSAS.

Kansas City.

American McKenna Process Co.

Pittsburg.

The Kansas City Southern Railway Co.

KENTUCKY.

Ashland.

Ashland Iron & Mining Co.

Ashland Steel Co.

Norton Iron Works.

Louisville.

Ewald Iron Co.

Louisville Steel & Iron Products Co.

Newport.

The Andrews Steel Co.

Newport Rolling Mill Co.

MAINE.

South Portland.

Bancroft & Martin Rolling Mills Co.

MARYLAND.

Baltimore.

The Baltimore & Ohio R. R. Co.

The Hess Steel Corporation (building).

Cumberland.

N. & G. Taylor Co.

United States Rail Co.

Sparrows Point.

Maryland Steel Co.

MASSACHUSETTS.

Bridgewater.

The Stanley Works.

Danversport.

The Sylvester Co.

West Wareham.

Tremont Nail Co.

Worcester.

The American Steel & Wire Co. (South Works).

Coes Wrench Co.

MICHIGAN.

Detroit.

American Car & Foundry Co.

John A. Crowley Co.

Detroit Seamless Steel Tubes Co.

Railway Steel-Spring Co.

Kalamazoo.

Harrow Spring Co.

MINNESOTA.

Duluth.

Minnesota Steel Co.

MISSOURI.

Kansas City.

The Kansas City Bolt & Nut Co.

St. Louis.

American Car & Foundry Co.

Hirsch Rolling Mill Co.

National Enameling & Stamping Co.

St. Louis Screw Co.

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.

Phillipsburg.

American Horse Shoe Co.

Riverside.

Cambridge Co.

Rockaway.

International High Speed Steel Co.

The Rockaway Rolling Mill.

Roebling.

John A. Roebling's Sons Co. (Kinkora Works).

Tremley Point.

American McKenna Process Co.

Trenton.

John A. Roebling's Sons Co. (Trenton Works).

NEW YORK.

Auburn.

C. W. Tuttle. (Auburn Iron Works).

Blasdell.

Seneca Iron & Steel Co.

Brooklyn.

F. W. Wurster & Co.

Buffalo.

Donner Steel Co., Inc.

Wickwire Steel Co. (projected).

Cohoes.

Cohoes Rolling Mill Co.

Cortland.

Wickwire Brothers, Inc.

Dunkirk.

Atlas Crucible Steel Co.

Lackawanna.

Lackawanna Steel Co.

Lockport.

Simonds Manufacturing Co.

Westerman & Co.

New York.

M. J. Dempsey. (Standard Rolling Mill). Long idle.

North Tonawanda.

Buffalo Bolt Co. (building).

Poughkeepsie.

Phoenix Horse Shoe Co.

Rome.

Rome Merchant Iron Mill.

Syracuse.

Crucible Steel Co. of America. (Sanderson Works).

Eckels-Nye Steel Co.

Halcomb Steel Co.

Syracuse Crucible Steel Co. (building).

Tonawanda.

Buffalo Steel Co.

Troy.

Burden Iron Co.

The Rail Joint Co. (Albany Iron & Steel Works Dept.).

Watervliet.

Ludlum Steel Co.

NORTH CAROLINA.

South Rocky Mount.

Atlantic Coast Line R. R. Co.

OHIO.

Bellaire.

Carnegie Steel Co.

Bridgeport.

American Sheet & Tin Plate Co. (Aetna-Standard Works).

Cambridge.

American Sheet & Tin Plate Co.:

Cambridge Works.

Guernsey Works.

Canal Dover.

- American Sheet & Tin Plate Co. (Dover Works).
- Reeves Manufacturing Co.

Canton.

- The Berger Manufacturing Co.
- The Canton Sheet Steel Co.
- The Carnahan Tin Plate & Sheet Co.
- The United Steel Co.

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.
- The Cleveland Hardware Co.
- The Cleveland Steel Co.
- The Empire Rolling Mill Co.
- Lake Erie Iron Co.
- The Otis Steel Co. :
 - Lakeside Works.
 - Riverside Works.
- The River Furnace Co. (building).
- The Union Rolling Mill Co.
- The Upson Nut Co.

Cleves.

- The Cincinnati Horse Shoe & Iron Co.

Columbia Heights (near Massillon).

- The Central Steel Co.

Columbus.

- Carnegie Steel Co.
- Standard Chain Co.

Cuyahoga Falls.

- Falls Hollow Staybolt Co.

Elyria.

- The Elyria Iron & Steel Co.

Girard.

- The A. M. Byers Co. of Ohio.

Ironton.

- The Kelly Nail & Iron Co.

Lorain.

- American Steel & Tube Co.
- The National Tube Co. of Ohio.

Lowellville.

- Youngstown Iron & Steel Co. (building).

Mansfield.

The Mansfield Sheet & Tinplate Co.

Marietta.

The Commonwealth Title Ins. & Trust Co. (Pittsburgh Sheet & Tin Plate Co.).

Marion.

Interstate Iron & Steel Co. (building).

Martins Ferry.

American Sheet & Tin Plate Co. (Laughlin Works).

Whitaker-Glessner Co.

Massillon.

The Massillon Rolling Mill Co.

Middletown.

The American Rolling Mill Co. :

East Side Works.

Central Works.

Mingo Junction.

Carnegie Steel Co. (Mingo Works).

Newark.

The Buckeye Rolling Mill Co.

New Philadelphia.

American Sheet & Tin Plate Co.

Niles.

The Brier Hill Steel Co. :

Empire Works.

Thomas Works.

The Deforest Sheet & Tinplate Co.

Norwalk.

Crucible Steel Co. of America.

Portsmouth.

Whitaker-Glessner Co.

Shelby.

The Ohio Seamless Tube Co.

Steubenville.

La Belle Iron Works.

Phillips Sheet & Tin Plate Co.

Struthers.

The Youngstown Sheet & Tube Co.

Warren.

The Trumbull Steel Co.

Warren Iron & Steel Co.

The Western Reserve Steel Co.

Wellsville.

American Sheet & Tin Plate Co.

Yorkville.

Wheeling Steel & Iron Co.

Youngstown.

The Brier Hill Steel Co.

Carnegie Steel Co. :

Ohio Works.

Upper Union Mills.

Lower Union Mills.

Republic Iron & Steel Co. :

Open Hearth Steel Works.

Bessemer Steel Works.

Brown Bonnell Works.

Youngstown Iron & Steel Co. -

The Youngstown Sheet & Tube Co.

Zanesville.

The American Rolling Mill Co. (Muskingum Branch).

OKLAHOMA.

Arkoma.

Fort Smith Iron & Steel Mills.

Sand Springs.

Osage Iron & Steel Co.

OREGON.

Portland.

Pacific Coast Steel Co.

PENNSYLVANIA.

Aliquippa.

— The J. C. Russell Shovel Co.

Vulcan Crucible Steel Co.

Allentown.

The American Steel & Wire Co.

Altoona.

The Altoona Iron Co.

Apollo.

Apollo Steel Co.

Apollo Electric Steel Co. (projected).

Auburn.

Delaware Seamless Tube Co.

Avonmore.

The Alcania Co. (idle).

Beaver Falls.

Ames Shovel & Tool Co.

Berwick.

American Car & Foundry Co.

Bessemer.

Carnegie Steel Co. (Edgar Thomson Works).

Birdsboro.

The E. & G. Brooke Iron Co.

Blandon.

Estate of Simon Seyfert. (Blandon Rolling Mill).

Brackenridge.

Allegheny Steel Co.

West Penn Steel Co.

Braddock.

The American Steel & Wire Co.

Braeburn.

Braeburn Steel Co.

Bridgeville.

Universal Rolling Mill Co.

Burnham.

Logan Iron & Steel Co.

Standard Steel Works Co.

Butler.

Forged Steel Wheel Co.

Canonsburg.

Canonsburg Steel & Iron Works.

Standard Tinplate Co.

Carnegie.

Superior Steel Co.

Catasauqua.

Bryden Horse Shoe Co.

Charleroi.

Hussey-Binns Shovel Co.

Chester.

Duplex Metals Co. (idle, partly dismantled).

Clairton.

Carnegie Steel Co.

Coatesville.

The Lukens Iron & Steel Co.

Worth Brothers Co. :

Brandywine Rolling Mills.

Valley Iron Works.

Viaduct Iron Works.

Colona.

Colonial Steel Co.

Columbia.

E. T. Edwards :

Columbia Mill.

East End Mill.

Susquehanna Mill.

Janson Steel & Iron Co.

Connellsville.

Sligo Steel Co.

Conshohocken.

Alan Wood Iron & Steel Co. (Schuylkill Iron Works).

J. Wood & Brothers Co.

Corry.

McInnes Steel Co., Ltd.

Crum Lynne.

Hervey S. Walker (Eddystone Steel Co.).

Danville.

Danville Structural Tubing Co.

Howe & Samuel, Inc.

Pennsylvania Brake Beam Co.

Reading Iron Co. :

Montour Rolling Mills Dept.

Danville Puddle Dept.

Donora.

The American Steel & Wire Co.

Duncannon.

Lebanon Valley Iron & Steel Co.

Duquesne.

Carnegie Steel Co. (Duquesne Works).

Eddystone.

The Baldwin Locomotive Works.

Ellwood City.

Shelby Steel Tube Co. (Standard Works).

Erie.

United States Horse Shoe Co.

Etna.

Spang, Chalfant & Co., Inc.

Farrell.

American Sheet & Tin Plate Co. :

Farrell Works.

Mercer Works.

The American Steel & Wire Co.

Carnegie Steel Co.

Franklin.

Franklin Steel Works.

Glassport.

Pittsburgh Steel Co.

Greenville.

Carnegie Steel Co.

Harrisburg.

Central Iron & Steel Co. :

Paxton Rolling Mills.

Central Iron Works.

Harrisburg Pipe & Pipe Bending Co.

Lalanc and Grosjean Manufacturing Co.

Hays Station (Allegheny County).

Carter Iron Co.

Homestead.

Carnegie Steel Co. (Howard Axle Works).

Hoopestown.

Hoopes & Townsend Co.

Hyde.

Newhall Rolling Mill Co. (idle).

Hyde Park.

American Sheet & Tin Plate Co.

Ivy Rock.

Alan Wood Iron & Steel Co.

Johnstown.

Cambria Steel Co. :

Cambria Plant.

Franklin Plant.

Gautier Plant.

Wire Mills.

Kittanning.

Kittanning Iron & Steel Manufacturing Co.

Lancaster.

Penn Iron Co. Ltd.

Latrobe.

Latrobe Electric Steel Co.

Railway Steel-Spring Co.

Vanadium Alloys Steel Co.

Lebanon.

American Iron & Steel Manufacturing Co.

Columbus Chain Co. (rolling mill idle).

Lebanon Valley Iron & Steel Co.

Leechburg.

American Sheet & Tin Plate Co.

McKees Rocks.

Carnegie Steel Co. (Schoen Steel Wheel Works).

Lockhart Iron & Steel Co.

McKeesport.

American Sheet & Tin Plate Co. (Wood's Works).

Firth-Sterling Steel Co.

National Tube Co. (National Works).

Midland.

Pittsburgh Crucible Steel Co.

Milton.

F. A. Godcharles Co. (idle).

The Milton Manufacturing Co.

Monessen.

American Sheet & Tin Plate Co. (National Works).

Carnegie Steel Co.

- Page Woven Wire Fence Co.
- Pittsburgh Steel Co.
- Pittsburgh Steel Products Co.
- Morado Station.
- Pittsburgh Seamless Tube Co.
- Munhall.
- Carnegie Steel Co. (Homestead Works).
- 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.
- Northumberland.
- Van Alen & Co. (Northumberland Iron & Nail Works).
- Parkesburg.
- The Parkesburg Iron Co.
- Pencoyd.
- American Bridge Co.
- Philadelphia.
- Davis Bros. Rolling Mill & Spike Works.
- Henry Disston & Sons Iron & Steel Works (Tacony).
- Ellwood Ivins' Tube Works.
- Hughes & Patterson.
- John Illingworth Steel Co. (Frankford).
- The Midvale Steel Co. (Nicetown).
- Nicetown Plate Washer Co. (Nicetown).
- Philadelphia Steel & Forge 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 Works.
 - McCutcheon Works.
 - Painter Works.
 - Upper Union Mills.
 - Lower Union Mills.

- Crucible Steel Co. of America :
 - Black Diamond Works.
 - Crescent Works.
 - LaBelle Works (Allegheny).
 - Singer-Nimick Works.
- Dilworth, Porter & Co., Ltd.
- Jones & Laughlin Steel Co. :
 - American Works.
 - Soho Works.
- National Tube Co. :
 - Continental Works.
 - National Works, Republic Dept.
- Oliver Iron & Steel Co.
- Pittsburgh Forge & Iron Co.
- Port Vue.
 - McKeesport Tin Plate Co.
- Pottstown.
 - Glasgow Iron Co. :
 - Glasgow Iron & Steel Works.
 - Pottstown Iron Works.
 - George B. Lessig Co.
 - Potts Brothers Iron Co., Ltd. (idle).
- Pottsville.
 - The Eastern Steel Co.
- Punxsutawney.
 - Clark Steel Hoop Co.
- Rankin.
 - The American Steel & Wire Co.
 - Copper Clad Steel Co.
- Reading.
 - American Iron & Steel Manufacturing Co.
 - Carpenter Steel Co.
 - Reading Iron Co. :
 - Ninth Street Mills Dept.
 - Oley Street Mills Dept.
 - Sheet Mill Dept.
 - Samuel R. Seyfert & Bro. (Seyfert Rolling Mill). Long idle.
- Schuylkill Haven.
 - Schuylkill Haven Rolling Mill.
- Scottdale.
 - American Sheet & Tin Plate Co. :
 - Old Meadow Works.
 - Scottdale Works.
- Scranton.
 - The Delaware, Lackawanna & Western R. R. Co.
 - Scranton Bolt & Nut Co.

Sharon.

Carnegie Steel Co.
 Sharon Steel Hoop Co.
 Wilkes Rolling Mill Co.

Sharpsburg.

Moorhead Brother & Co., Inc. (Vesuvius Iron & Nail Works).

Slatington.

Edwin German (Slatington Rolling Mill). Idle, for sale.

South Bethlehem.

Bethlehem Steel Co.:
 Lehigh Plant.
 Saucon Plant.

Steelton.

The Pennsylvania Steel Co.

Titusville.

Cyclops Steel Works.

Vandergrift.

American Sheet & Tin Plate Co.

Washington.

Griffiths Charcoal Iron Mills.
 Jessop Steel Co.
 The Tyler Tube & Pipe Co.
 Washington Tin Plate Co.

Waynesburg.

American Steel Co.

West Leechburg.

West Leechburg Steel Co.

Williamsport.

Sweet's Steel Co. (Newberry).
 Williamsport Iron & Nail 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.

Valley Falls.

Rhode Island-Perkins Horse Shoe Co.

TENNESSEE.

Knoxville (Lonsdale).

Knoxville Iron Co.

TEXAS.

Fort Worth.
Texas Rolling Mill Co.

UTAH.

Midvale.
Utah Iron & Steel Co.

VIRGINIA.

Richmond.
Old Dominion Iron & Nail Works Co.
The Tredegar Co.
Roanoke.
Loucks Iron & Steel Co. (idle).

WASHINGTON.

Youngstown.
Pacific Coast Steel Co. (Seattle Works).

WEST VIRGINIA.

Benwood.
National Tube Co. (Riverside Works).
Wheeling Steel & Iron Co. :
Wheeling Steel Works.
Benwood Tube Works.
Charleston.
Becker Steel Co of America, Inc.
Chester.
American Sheet & Tin Plate Co.
Clarksburg.
Phillips Sheet & Tin Plate Co.
Follansbee.
Follansbee Brothers Co.
Huntington.
The West Virginia Rail Co.
Morgantown.
American Sheet & Tin Plate Co. (Sabraton Works).
Paden City.
Carter Iron Co.
Parkersburg.
The Parkersburg Iron & Steel Co.
Weirton.
Phillips Sheet & Tin Plate Co. :
Weirton Plant.
Cold Rolled Strip Dept.
Wheeling.
American Sheet & Tin Plate Co. (La Belle Works).
La Belle Iron Works.

Wheeling Steel & Iron Co. :
Belmont Works.
Top Mill.
Whitaker-Glessner Co.

WISCONSIN.

Milwaukee.
The Globe Seamless Steel Tubes Co.
Illinois Steel Co.
Wrought Washer Mfg. Co.
South Milwaukee.
Racine Iron & Metal Co. (idle, for sale).

CANADA.

ALBERTA.

Medicine Hat.
The Alberta Rolling Mills Co., Ltd.
Redcliff.
The Redcliff Rolling Mills & Bolt Co., Ltd.

BRITISH COLUMBIA.

Port Moody.
Port Moody Steel Works, Ltd. (building).

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.

Belleville.
The Steel Co. of Canada, Ltd.
Collingwood.
The William Kennedy & Sons, Ltd.

Gananoque.

The D. F. Jones Manufacturing Co.

Hamilton.

Burlington Steel Co., Ltd.

Canadian Horse Shoe Co. (building).

The Steel Co. of Canada, Ltd. :

Hamilton Works.

Ontario Works.

London.

London Rolling Mill Co., Ltd.

Morrisburg.

J. Wesley Allison (plant idle ; for sale or lease).

Sault Ste. Marie.

Algoma Steel Corporation.

Welland.

Canadian Steel Foundries, Ltd.

QUEBEC.

Longueuil.

Armstrong, Whitworth of Canada, Ltd.

Montreal.

Grand Trunk Railway System.

The Peck Rolling Mills, Ltd.

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.
 Allegheny Steel Co., Pittsburgh, Pa.
 American Bridge Co., Pittsburgh, Pa.
 American Iron & Steel Manufacturing Co., Lebanon, Pa. (own use).
 American Rolling Mill Co. (The), Middletown, Ohio.
 American Steel & Wire Co. (The), Cleveland, Ohio. (F.)
 American Tube & Stamping Co., Bridgeport, Conn.
 Andrews Steel Co. (The), Newport, Ky. (F.)
 Ashland Steel Co., Inc.; Ashland, Ky. (F.)
 Atlantic Steel Co., Atlanta, Ga.
 Bethlehem Steel Co., South Bethlehem, Pa. (F.)
 Brier Hill Steel Co. (The), Youngstown, Ohio.
 Cambria Steel Co., Philadelphia, Pa. (F.)
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada.
 Carbon Steel Co., Pittsburgh, Pa. (F.)
 Carnegie Steel Co., Pittsburgh, Pa. (F.)
 Carpenter Steel Co. (The), Reading, Pa. (own use).
 Central Steel Co. (The), Massillon, Ohio.
 Colonial Steel Co., Pittsburgh, Pa. (F.)
 Colorado Fuel & Iron Co., Denver, Col. (F.)
 Crucible Steel Co. of America, Pittsburgh, Pa. (F.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (F.)
 Donner Steel Co., Inc., Philadelphia, Pa.
 Eastern Steel Co. (The), Pottsville, Pa.
 Forged Steel Wheel Co., Pittsburgh, Pa. (F.; own use.)
 Grand Crossing Tack Co., Chicago, Ill. (own use).
 Gulf States Steel Co., Birmingham, Ala.
 Halcomb Steel Co., Syracuse, N. Y. (F.; own use).
 Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa.
 Hess Steel Corporation (The), Baltimore, Md. (building).
 Illinois Steel Co., Chicago, Ill. (F.)
 Inland Steel Co., Chicago, Ill. (F.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (F.)
 Kennedy & Sons, Ltd. (The William), Owen Sound, Ont., Canada.
 Kokomo Steel & Wire Co., Kokomo, Ind. (own use).
 La Belle Iron Works, Steubenville, Ohio. (F.)
 Lackawanna Steel Co., Buffalo, N. Y. (F.)
 Laclede Steel Co., St. Louis, Mo.
 Lukens Iron & Steel Co. (The), Coatesville, Pa. (F.)
 Maryland Steel Co., Philadelphia, Pa. (F.)

Midvale Steel Co. (The), Philadelphia, Pa. (F.)
Minnesota Steel Co., Duluth, Minn.
National Tube Co., Pittsburgh, Pa. (F.)
National Tube Co. of Ohio (The), Lorain, Ohio. (F.)
Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Canada. (F.)
Otis Steel Co. (The), Cleveland, Ohio. (F.)
Pacific Coast Steel Co., San Francisco, Cal.
Page Woven Wire Fence Co., Adrian, Mich. (own use).
Pardee (The C.) Works, Perth Amboy, N. J. (F.)
Pennsylvania Steel Co. (The), Philadelphia, Pa. (F.)
Phoenix Iron Co. (The), Philadelphia, Pa. (own use).
Pittsburgh Crucible Steel Co., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, Ohio.
River Furnace Co. (The), Cleveland, Ohio. (building).
Røbling's (John A.) Sons Co., Trenton, N. J. (own use).
Sharon Steel Hoop Co., Sharon, Pa.
Southern California Iron & Steel Co., Los Angeles, Cal.
Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada. (F.)
Sweet's Steel Co., Williamsport, Pa. (F.)
Taylor (N. & G.) Co., Philadelphia, Pa. (F.)
Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (F.)
Tremont Nail Co., West Wareham, Mass. (F.)
United Steel Co. (The), Canton, Ohio. (F.)
Upton Nut Co. (The), Cleveland, Ohio. (F.)
Vulcan Crucible Steel Co., Aliquippa, Pa. (F.)
Washburn Wire Co., Phillipsdale, R. I.
West Penn Steel Co., Brackenridge, Pa. (F.)
Wheeling Steel & Iron Co., Wheeling, W. Va.
Whitaker-Glessner Co., Wheeling, W. Va. (F.)
Wickwire Brothers, Inc., Cortland, N. Y. (own use).
Wickwire Steel Co., Buffalo, N. Y. (projected).
Wisconsin Steel Co., Chicago, Ill. (F.)
Wurster (F. W.) & Co., Brooklyn, N. Y. (F.)
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF SHEET BARS AND TINPLATE BARS.

Allegheny Steel Co., Pittsburgh, Pa.
American Rolling Mill Co. (The), Middletown, Ohio.
American Sheet and Tin Plate Co., Pittsburgh, Pa. (own use).
American Steel & Tube Co., Lorain, Ohio.
American Tube & Stamping Co., Bridgeport, Conn.
Andrews Steel Co. (The), Newport, Ky.
Apollo Electric Steel Co., Apollo, Pa. (projected).
Ashland Steel Co., Inc., Ashland, Ky.
Brier Hill Steel Co. (The), Youngstown, Ohio.

Cambria Steel Co., Philadelphia, Pa.
 Carnahan Tin Plate & Sheet Co. (The), Canton, Ohio. (own use).
 Carnegie Steel Co., Pittsburgh, Pa.
 Carter Iron Co., Pittsburgh, Pa. (own use).
 Central Steel Co. (The), Massillon, Ohio.
 Follansbee Brothers Co., Pittsburgh, Pa.
 Griffiths Charcoal Iron Mills, Washington, Pa. (own use).
 Halcomb Steel Co., Syracuse, N. Y.
 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., Buffalo, N. Y.
 Louisville Steel & Iron Products Co., Louisville, Ky.
 National Enameling & Stamping Co., New York, N. Y. (own use).
 Parkersburg Iron & Steel Co. (The), Parkersburg, W. Va.
 Reeves Manufacturing Co., Canal Dover, Ohio.
 Republic Iron & Steel Co., Youngstown, Ohio.
 River Furnace Co. (The), Cleveland, Ohio. (building).
 Sharon Steel Hoop Co., Sharon, Pa.
 Simonds Manufacturing Co., Fitchburg, Mass.
 Taylor (N. & G.) Co., Philadelphia, Pa.
 United Steel Co. (The), Canton, Ohio.
 Walker, Hervey S., Philadelphia, Pa.
 West Penn Steel Co., Brackenridge, Pa.
 Wheeling Steel & Iron Co., Wheeling, W. Va.
 Whitaker-Glessner Co., Wheeling, W. Va.
 Wilkes Rolling Mill Co., Sharon, Pa.
 Youngstown Iron & Steel Co., Youngstown, Ohio. (building).
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF RAILS.

(H. = HEAVY RAILS. L. = LIGHT RAILS. G. = GIRDER RAILS. R. = ROLLED RAILS.)

Algoma Steel Corporation, Sault Ste. Marie, Ont., Canada. (H., L.)
 American McKenna Process Co., Milwaukee, Wis. (R.)
 Bethlehem Steel Co., South Bethlehem, Pa. (H.)
 Buckeye Rolling Mill Co. (The), Steubenville, Ohio. (R.)
 Cambria Steel Co., Philadelphia, Pa. (H., L., R.)
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada. (L.)
 Carnegie Steel Co., Pittsburgh, Pa. (H., L.)
 Colorado Fuel & Iron Co., Denver, Col. (H., L., R.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (H.)
 Hirsch Rolling Mill Co., St. Louis, Mo. (L.)
 Illinois Steel Co., Chicago, Ill. (H., L.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (L.)

Kennedy & Sons, Ltd. (The William), Owen Sound, Ont., Canada. (L.)
 Lackawanna Steel Co., Buffalo, N. Y. (H., L., G.)
 Maryland Steel Co., Philadelphia, Pa. (H.)
 Minnesota Steel Co., Duluth, Minn. (H.)
 National Tube Co. of Ohio (The), Lorain, Ohio. (H., G.)
 Newhall Rolling Mill Co., Philadelphia, Pa. (idle; R.)
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Canada. (L.)
 Ohio Falls Iron Co., New Albany, Ind. (L.)
 Pacific Coast Steel Co., San Francisco, Cal. (R.)
 Peck Rolling Mills, Ltd. (The), Montreal, P. Q., Canada. (L.)
 Pennsylvania Steel Co. (The), Philadelphia, Pa. (H., L., G.)
 Port Moody Steel Works, Ltd., Vancouver, B. C., Canada. (L.)
 Portland Rolling Mills, Ltd. (The), St. John, N. B., Canada. (L.)
 Scranton Bolt & Nut Co., Scranton, Pa. (R.)
 Standard Chain Co., Pittsburgh, Pa. (L.)
 Sweet's Steel Co., Williamsport, Pa. (R.)
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (H., L.)
 United States Rail Co., Cumberland, Md. (R.)
 Utah Iron & Steel Co., Midvale, Utah. (L.)
 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.)
 American Bridge Co., Pittsburgh, Pa. (H., L.)
 Bethlehem Steel Co., South Bethlehem, Pa. (H.)
 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.)
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada. (L.)
 Carnegie Steel Co., Pittsburgh, Pa. (H., L.)
 Chrome Steel Works, Chrome, N. J. (H.)
 Colorado Fuel & Iron Co., Denver, Col. (L.)
 Danville Structural Tubing Co., Danville, Pa. (L.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (H., L.)
 Eastern Steel Co. (The), Pottsville, Pa. (H., L.)
 Elyria Iron & Steel Co. (The), Cleveland, Ohio. (L.)
 Forged Steel Wheel Co., Pittsburgh, Pa. (own use; L.)
 Franklin Steel Works, Franklin, Pa. (L.)
 Hirsch Rolling Mill Co., St. Louis, Mo. (L.)
 Illinois Steel Co., Chicago, Ill. (H., L.)
 Inland Steel Co., Chicago, Ill. (H., 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.)

Lackawanna Steel Co., Buffalo, N. Y. (H., L.)
 Laclede Steel Co., St. Louis, Mo. (L.)
 Lockhart Iron & Steel Co., Pittsburgh, Pa. (L.)
 Logan Iron & Steel Co., Philadelphia, Pa. (L.)
 Minnesota Steel Co., Duluth, Minn. (H.)
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Canada. (L.)
 Ohio Falls Iron Co., New Albany, Ind. (L.)
 Pacific Coast Steel Co., San Francisco, Cal. (L.)
 Pennsylvania Brake Beam Co., Danville, Pa. (H.)
 Pennsylvania Steel Co. (The), Philadelphia, Pa. (H., L.)
 Phoenix Iron Co. (The), Philadelphia, Pa. (H., L.)
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa. (L.)
 Republic Iron & Steel Co., Youngstown, Ohio. (L.)
 Rockaway Rolling Mill (The), Rockaway, N. J. (L.)
 Rudgear-Merle Co., San Francisco, Cal. (L.)
 Southern Pacific Co., San Francisco, Cal. (L.)
 Sweet's Steel Co., Williamsport, Pa. (L.)
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (H., L.)
 Wisconsin Steel Co., Chicago, Ill. (L.)

MANUFACTURERS OF WIRE RODS.

American Electrical Works, Phillipsdale, R. I.
 American Steel & Wire Co. (The), Cleveland, Ohio.
 Ashland Steel Co., Inc., Ashland, Ky.
 Atlantic Steel Co., Atlanta, Ga.
 Cambria Steel Co., Philadelphia, Pa.
 Carpenter Steel Co. (The), Reading, Pa.
 Colonial Steel Co., Pittsburgh, Pa. (copper-clad).
 Colorado Fuel & Iron Co., Denver, Col.
 Copper Clad Steel Co., Pittsburgh, Pa. (copper-clad).
 Crucible Steel Co. of America, Pittsburgh, Pa. (for drill rods).
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada.
 Firth-Sterling Steel Co., McKeesport, Pa. (for drill rods).
 Grand Crossing Tack Co., Chicago, Ill.
 Gulf States Steel Co., Birmingham, Ala.
 Halcomb Steel Co., Syracuse, N. Y.
 Illinois Steel Co., Chicago, Ill.
 Jones & Laughlin Steel Co., Pittsburgh, Pa.
 Kennedy & Sons, Ltd. (The William), Owen Sound, Ont., Canada.
 Kokomo Steel & Wire Co., Kokomo, Ind.
 Lackawanna Steel Co., Buffalo, N. Y.
 Page Woven Wire Fence Co., Adrian, Mich.
 Pittsburgh Steel Co., Pittsburgh, Pa.
 Røbling'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., Inc., Cortland, N. Y.

Wickwire Steel Co., Buffalo, N. Y. (projected).

Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF UNIVERSAL AND SHEARED PLATES.

(U. = UNIVERSAL PLATES. S. = SHEARED PLATES.)

Alan Wood Iron & Steel Co., Philadelphia, Pa. (U., S.)

Allegheny Steel Co., Pittsburgh, Pa. (S.)

American Bridge Co., Pittsburgh, Pa. (U.)

American Sheet & Tin Plate Co., Pittsburgh, Pa. (S.)

American Steel & Tube Co., Lorain, Ohio. (S.)

Cambria Steel Co., Philadelphia, Pa. (U., S.)

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.)

Crucible Steel Co. of America, Pittsburgh, Pa. (S.)

Disston (Henry) & Sons Iron & Steel Works, Philadelphia, Pa. (S.)

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.)

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., Buffalo, N. Y. (U., S.)

Lukens Iron & Steel Co. (The), Coatesville, Pa. (U., S.)

Moorhead Brother & Co., Inc., Sharpsburg, Pa. (S.)

National Enameling & Stamping Co., New York, N. Y. (U.)

National Tube Co., Pittsburgh, Pa. (U., S. ; for skelp).

National Tube Co. of Ohio, Lorain, Ohio (U., S. ; for skelp).

Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Canada. (S.)

Otis Steel Co. (The), Cleveland, Ohio. (S.)

Pine Iron Works Co., Pine Forge, Pa. (S.)

Republic Iron & Steel Co., Youngstown, Ohio. (S.)

Simonds Manufacturing Co., Fitchburg, Mass. (own use ; S.)

Sligo Steel Co., Connellsville, Pa. (S.)

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (S.)

United Steel Co. (The), Canton, Ohio. (U.)

Universal Rolling Mill Co., Bridgeville, Pa. (S.)

Warren Iron & Steel Co., Warren, Ohio. (S.)

Whitaker-Glessner Co., Wheeling, W. Va. (U., S.)

Wood (J.) & Brothers Co., Conshohocken, Pa. (S.)
 Worth Brothers Co., Philadelphia, Pa. (S.)
 Wrought Washer Co., Milwaukee, Wis. (own use ; S.)
 Youngstown Iron & Steel Co., Youngstown, Ohio. (S.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (U. S. ; for skelp).

MANUFACTURERS OF BLACK SHEETS.

Alan Wood Iron & Steel Co., Philadelphia, Pa.
 Allegheny Steel Co., Pittsburgh, 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.
 Berger Manufacturing Co. (The), Canton, Ohio.
 Brier Hill Steel Co. (The), Youngstown, Ohio.
 Canonsburg Steel & Iron Works, Canonsburg, Pa.
 Canton Sheet Steel Co. (The), Canton, Ohio.
 Carnahan Tin Plate & Sheet Co. (The), Canton, Ohio.
 Carter Iron Co., Pittsburgh, Pa.
 Central Iron & Steel Co., Harrisburg, Pa.
 Colonial Steel Co., Pittsburgh, Pa.
 Crucible Steel Co. of America, Pittsburgh, Pa.
 Deforest Sheet and Tinplate Co. (The), Niles, Ohio.
 Empire Rolling Mill Co. (The), Cleveland, Ohio. (building).
 Follansbee Brothers Co., Pittsburgh, Pa.
 Griffiths Charcoal Iron Mills, Washington, Pa.
 Halcomb Steel Co., Syracuse, N. Y.
 Hussey-Binns Shovel Co., Pittsburgh, Pa. (own use).
 Illingworth (John) Steel Co., Philadelphia, Pa.
 Indiana Rolling Mill Co., New Castle, Ind.
 Inland Steel Co., Chicago, Ill.
 Jessop Steel Co., New York, N. Y.
 Jones & Laughlin Steel Co., Pittsburgh, Pa.
 La Belle Iron Works, Steubenville, Ohio.
 Lalance & Grosjean Manufacturing Co., New York, N. Y.
 Louisville Steel & Iron Products Co., Louisville, Ky.
 McCullough Iron Co., Wilmington, Del.
 Mansfield Sheet & Tinplate Co. (The), Mansfield, Ohio.
 Massillon Rolling Mill Co. (The), Massillon, Ohio.
 National Enameling & Stamping Co., New York, N. Y.
 Newport Rolling Mill Co., Newport, Ky.
 Otis Steel Co. (The), Cleveland, Ohio.
 Parkersburg Iron & Steel Co. (The), Parkersburg, W. Va.

Phillips Sheet & Tin Plate Co., Weirton, W. Va.
Reeves Manufacturing Co., Canal Dover, Ohio.
Seneca Iron & Steel Co., Buffalo, N. Y.
Simonds Manufacturing Co., Fitchburg, Mass.
Taylor (N. & G.) Co., Philadelphia, Pa.
Tremont Nail Co., West Wareham, Mass.
Trumbull Steel Co. (The), Warren, Ohio.
Universal Rolling Mill Co., Bridgeville, Pa.
Warren Iron & Steel Co., Warren, Ohio.
West Penn Steel Co., Brackenridge, Pa.
Western Reserve Steel Co. (The), Warren, Ohio.
Wheeling Steel & Iron Co., Wheeling, W. Va.
Whitaker-Glessner Co., Wheeling, W. Va.
Wilkes Rolling Mill Co., Sharon, Pa.
Wood (J.) & Brothers Co., Conshohocken, Pa.
Worth Brothers Co., Philadelphia, Pa.
Wyoming Shovel Works (The), Wyoming, Pa.
Youngstown Iron & Steel Co., Youngstown, Ohio.
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF GALVANIZED SHEETS.

(Not including manufacturers of galvanized sheets in Canada.)

Allegheny Steel Co., Pittsburgh, Pa.
American Rolling Mill Co. (The), Middletown, Ohio.
American Sheet & Tin Plate Co., Pittsburgh, Pa.
American Steel Package Co. (The), Defiance, Ohio.
Apollo Steel Co., Apollo, Pa.
Ashland Iron and Mining Co., Ashland, Ky.
Berger Manufacturing Co. (The), Canton, Ohio.
Brier Hill Steel Co. (The), Youngstown, Ohio.
Canton Sheet Steel Co. (The), Canton, Ohio.
Chapman Steel Co., Indianapolis, Ind.
Cramp & Sons Ship and Engine Building Co. (The William) Philadelphia, Pa.
Defiance Pressed Steel Co. (The), Defiance, Ohio.
Deforest Sheet and Tinplate Co. (The), Niles, Ohio.
Delphos Manufacturing Co. (The), Delphos, Ohio.
Empire Rolling Mill Co. (The), Cleveland, Ohio (building).
Follansbee Brothers Co., Pittsburgh, Pa.
Gem Stamped Steel Co., Chelsea, Mass.
Hanlon-Gregory Galvanizing Co., Pittsburgh, Pa.
Inland Steel Co., Chicago, Ill.
J. C. H. Galvanizing Co., Inc., Philadelphia, Pa.
Koven (L. O.) & Brother, New York, N. Y.

La Belle Iron Works, Steubenville, Ohio.
 McCullough Iron Co., Wilmington, Del.
 McVoy Sheet & Tin Plate Co., Chicago, Ill.
 Mansfield Sheet & Tinplate Co. (The), Mansfield, Ohio.
 Martin Manufacturing Co., Mason City, Iowa.
 Massillon Rolling Mill Co. (The), Massillon, Ohio.
 Meaker Co. (The), Chicago, Ill.
 National Enameling & Stamping Co., New York, N. Y.
 National Galvanizing Co., Chicago, Ill.
 Newport Rolling Mill Co., Newport, Ky.
 Ohio Galvanizing & Manufacturing Co. (The), Niles, Ohio.
 Parkersburg Iron & Steel Co. (The), Parkersburg, W. Va.
 Reeves Manufacturing Co., Canal Dover, Ohio.
 Seneca Iron & Steel Co., Buffalo, N. Y.
 Trumbull Steel Co. (The), Warren, Ohio.
 Western Reserve Steel Co. (The), Warren, Ohio.
 Wheeling Corrugating Co., Wheeling, W. Va.
 Wheeling Metal & Manufacturing Co., Wheeling, W. Va.
 Whitaker-Glessner Co., Wheeling, W. Va.
 Youngstown Iron & Steel Co., Youngstown, Ohio.
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF BLACK PLATES FOR TINNING.

American Rolling Mill Co. (The), Middletown, Ohio.
 American Sheet & Tin Plate Co., Pittsburgh, Pa.
 American Steel Co., Pittsburgh, Pa.
 Canonsburg Steel & Iron Works, Canonsburg, Pa.
 Carnahan Tin Plate & Sheet Co. (The), Canton, Ohio.
 Deforest Sheet and Tinplate Co. (The), Niles, Ohio.
 Follansbee Brothers Co., Pittsburgh, Pa.
 Griffiths Charcoal Iron Mills, Washington, Pa.
 Jones & Laughlin Steel Co., Pittsburgh, Pa.
 Lalance & Grosjean Manufacturing Co., New York, N. Y.
 McKeesport Tin Plate Co., McKeesport, Pa.
 Massillon Rolling Mill Co. (The), Massillon, Ohio.
 National Enameling & Stamping Co., New York, N. Y.
 Phillips Sheet & Tin Plate Co., Weirton, W. Va.
 Pittsburgh Sheet & Tin Plate Co., Pittsburgh, Pa.
 Standard Tinplate Co., Canonsburg, Pa.
 Taylor (N. & G.) Co., Philadelphia, Pa.
 Trumbull Steel Co. (The), Warren, Ohio.
 Washington Tin Plate Co., Washington, Pa.
 Wheeling Steel & Iron Co., Wheeling, W. Va.
 Whitaker-Glessner Co., Wheeling, W. Va.
 Wilkes Rolling Mill Co., Sharon, Pa.

MANUFACTURERS OF TINPLATES AND TERNE PLATES.

American Rolling Mill Co. (The), Middletown, Ohio.
 American Sheet & Tin Plate Co., Pittsburgh, Pa.
 American Steel Co., Pittsburgh, Pa.
 Buhl Stamping Co., Detroit, Mich.
 Carnahan Tin Plate & Sheet Co. (The), Canton, Ohio.
 Deforest Sheet and Tinplate Co. (The), Niles, Ohio. (long terne.)
 Ferguson Tin Plate Co., Pittsburgh, Pa. (redip terne plates).
 Follansbee Brothers Co., Pittsburgh, Pa.
 Griffiths Charcoal Iron Mills, Washington, Pa. (terne plates only.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa.
 Lalance & Grosjean Mfg. Co., New York, N. Y.
 McKeesport Tin Plate Co., McKeesport, Pa.
 Merchant and Evans Co., Philadelphia, Pa.
 National Enameling & Stamping Co., New York, N. Y.
 Phillips Sheet & Tin Plate Co., Weirton, W. Va.
 Pittsburgh Sheet & Tin Plate Co., Pittsburgh, Pa.
 Standard Tinplate Co., Canonsburg, Pa.
 Sturges & Burn Manufacturing Co., Chicago, Ill.
 Taylor (N. & G.) Co., Philadelphia, Pa.
 Trumbull Steel Co. (The), Warren, Ohio.
 Washington Tin Plate Co., Washington, Pa.
 Wheeling Corrugating Co., Wheeling, W. Va.
 Wheeling Steel & Iron Co., Wheeling, W. Va.

MANUFACTURERS OF MUCK BAR.

Alan Wood Iron & Steel Co., Philadelphia, Pa. -
 Altoona Iron Co. (The), Altoona, Pa.
 American Car and Foundry Co., New York, N. Y.
 American Iron & Steel Manufacturing Co., Lebanon, Pa.
 Anniston Ordnance Co., Anniston, Ala.
 Bethlehem Steel Co., South Bethlehem, Pa.
 Brooke (The E. & G.) Iron Co., Birdsboro, Pa.
 Brown & Co., Inc., Pittsburgh, Pa. (own use.)
 Burden Iron Co., Troy, N. Y. (own use.)
 Byers (A. M.) Co., Pittsburgh, Pa. (own use.)
 Byers (The A. M.) Co. of Ohio, Girard, Ohio. (own use.)
 Carter Iron Co., Pittsburgh, Pa.
 Cohoes Rolling Mill Co., Cohoes, N. Y.
 Colonial Steel Co., Pittsburgh, Pa.
 Connors-Weyman Steel Co., Birmingham, Ala.
 Cowin (Frederick) & Co., Inc., Chicago, Ill. (own use.)
 Cylops Steel Works, Titusville, Pa. (own use.)
 Edwards, E. T., Columbia, Pa.
 Empire Rolling Mill Co. (The), Cleveland, Ohio.

Ewald Iron Co., Louisville, Ky.
 Fort Wayne Rolling Mill Corp'n. (The), Fort Wayne, Ind.
 Glasgow Iron Co., Pottstown, Pa.
 Highland Iron & Steel Co. (The), Terre Haute, Ind.
 Hoopes & Townsend Co., Philadelphia, Pa.
 Howe & Samuel, Inc., Philadelphia, Pa.
 Hughes & Patterson, Philadelphia, Pa.
 Interstate Iron & Steel Co., Chicago, Ill.
 Kittanning Iron & Steel Manufacturing Co., Kittanning, Pa.
 Knoxville Iron Co., Knoxville, Tenn. (own use.)
 Lebanon Valley Iron & Steel Co., Lebanon, Pa.
 Lessig (George B.) Co., Pottstown, Pa.
 Lockhart Iron & Steel Co., Pittsburgh, Pa.
 Logan Iron & Steel Co., Philadelphia, Pa.
 Louisville Steel & Iron Products Co., Louisville, Ky.
 Milton Manufacturing Co. (The), Milton, Pa.
 Moorhead Brother & Co., Inc., Sharpsburg, Pa.
 National Tube Co., Pittsburgh, Pa.
 Newhall Rolling Mill Co., Philadelphia, Pa.
 Ohio Falls Iron Co., New Albany, Ind.
 Old Dominion Iron & Nail Works Co., Richmond, Va.
 Parkesburg Iron Co. (The), Parkesburg, Pa.
 Penn Iron Co., Ltd., Lancaster, Pa.
 Phoenix Horse Shoe Co., Chicago, Ill.
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa.
 Portland Rolling Mills, Ltd. (The), St. John, N. B., Canada.
 Reading Iron Co., Reading, Pa.
 Redcliff Rolling Mills & Bolt Co., Ltd. (The), Redcliff, Alberta, Canada.
 Reeves Manufacturing Co., Canal Dover, Ohio.
 Republic Iron & Steel Co., Youngstown, Ohio.
 Rome Merchant Iron Mill, Rome, N. Y.
 Scranton Bolt & Nut Co., Scranton, Pa.
 Sellers Manufacturing Co., Chicago, Ill.
 Seyfert (Simon), Estate of, Blandon, Pa. (Blandon Rolling Mill).
 Sligo Steel Co., Connellsville, Pa.
 Spang, Chalfant & Co., Inc., Pittsburgh, Pa.
 Standard Chain Co., Pittsburgh, Pa.
 Sylvester Co. (The), Danvers, Mass.
 Ulster Iron Works, Dover, N. J.
 Union Rolling Mill Co. (The), Cleveland, Ohio.
 Walker, Hervev S., Philadelphia, Pa.
 Wheeling Steel & Iron Co., Wheeling, W. Va.
 Wilkes Rolling Mill Co., Sharon, Pa.
 Williamsport Iron & Nail Co., Williamsport, Pa.
 Wood (J.) & Brothers Co., Conshohocken, Pa.
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF MERCHANT BARS.

(I. = IRON MERCHANT BARS. S. = STEEL MERCHANT 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.)

Alan Wood Iron & Steel Co., Philadelphia, Pa. (I., S.)

Alberta Rolling Mills Co., Ltd. (The), Medicine Hat, Alberta, Canada. (I., S., R.)

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 Iron & Steel Manufacturing Co., Lebanon, Pa. (I., S.)

American Rolling Mill Co. (The), Middletown, Ohio. (S.)

American Steel & Wire Co. (The), Cleveland, Ohio. (S.)

Ames (W.) & Co., Jersey City, N. J. (I.)

Anniston Ordnance Co., Anniston, Ala. (I., 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. (I., S.)

Baltimore & Ohio Railroad Co. (The), Baltimore, Md. (own use; I., S.)

Bancroft & Martin Rolling Mills Co., Portland, Me. (I., S., R.)

Bethlehem Steel Co., South Bethlehem, Pa. (I., S.)

Braeburn Steel Co., Braeburn, Pa. (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., Philadelphia, Pa. (S., R.)

Cambridge Co., Riverside, N. J. (I., S.)

Canadian Car & Foundry Co., Ltd., Montreal, P. Q., Canada. (I., S.)

Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada. (S., R.)

Carbon Steel Co., Pittsburgh, Pa. (S.)

Carnegie Steel Co., Pittsburgh, Pa. (S., R.)

Carpenter Steel Co., Reading, Pa. (S.)

Carter Iron Co., Pittsburgh, Pa. (I.)

Central of Georgia Railway Co., Savannah, Ga. (own use; I.)

Clark Steel Hoop Co., Punxsutawney, Pa. (S.)

Cleveland Hardware Co. (The), Cleveland, Ohio. (own use; S.)

Collins Co. (The), Collinsville, Conn. (I., S.)

Colonial Steel Co., Pittsburgh, Pa. (S.)

Colorado Fuel & Iron Co., Denver, Col. (I., S., R.)

- Connors-Weyman Steel Co., Birmingham, Ala. (I., S.)
 Cowin (Frederick) & Co., Inc., Chicago, Ill. (I.)
 Crucible Steel Co. of America, Pittsburgh, Pa. (S.)
 Cyclops Steel Works, Titusville, Pa. (I., S.)
 Davis Bros. Rolling Mill & Spike Works, Philadelphia, Pa. (I., S., R.)
 Delaware, Lackawanna & Western R. R. Co. (The), Scranton, Pa.
 (own use; I.)
 Disston (Henry) & Sons Iron & Steel Works, Philadelphia, Pa. (S.)
 Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada. (S., R.)
 Eckels-Nye Steel Co., Syracuse, N. Y. (S.)
 Edwards, E. T., Columbia, Pa. (I., S.)
 Empire Rolling Mill Co. (The), Cleveland, Ohio. (I., S.)
 Ewald Iron Co., Louisville, Ky. (I.)
 Falls Hollow Staybolt Co., Cuyahoga Falls, Ohio. (staybolt; I., S.)
 Farist Steel Co. (The), Bridgeport, Conn. (S.)
 Forged Steel Wheel Co., Pittsburgh, Pa. (own use; S.)
 Fort Smith Iron & Steel Mills, Fort Smith, Arkansas. (I.)
 Fort Wayne Rolling Mill Corp'n. (The), Fort Wayne, Ind. (I., S., R.)
 Franklin Steel Works, Franklin, Pa. (S., R.)
 German, Edwin, Slatington, Pa. (I.)
 Glasgow Iron Co., Pottstown, Pa. (I., S.)
 Grand Trunk Railway System, Montreal, P. Q., Canada. (own use; I.)
 Gulf States Steel Co., Birmingham, Ala. (S., R.)
 Halcomb Steel Co., Syracuse, N. Y. (S.)
 Harrow Spring Co., Milwaukee, Mich. (I., S.)
 Heller Bros. Co., Newark, N. J. (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. (own use; I., S.)
 Hughes & Patterson, Philadelphia, Pa. (I.)
 Illingworth (John) Steel Co., Philadelphia, Pa. (I., S.)
 Illinois Steel Co., Chicago, Ill. (S., R.)
 Indiana Rolling Mill Co., New Castle, Ind. (S.)
 Inland Steel 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 Railway Co., Kansas City, Mo. (own use; I.)
 Kennedy & Sons, Ltd. (The William), Owen Sound, Ont., Canada, (S.)
 Knoxville Iron Co., Knoxville, Tenn. (I., S.)
 Lackawanna Steel Co., Buffalo, N. Y. (S., R.)
 Laclede Steel Co., St. Louis, Mo. (S., R.)
 Lake Erie Iron Co., Cleveland, Ohio. (I., S.)
 Lebanon Valley Iron & Steel Co., Lebanon, Pa. (I.)

- 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., S.)
 Manitoba Rolling Mill Co., Ltd., Winnipeg, Manitoba, Canada. (I.)
 Midvale Steel Co. (The), Philadelphia, Pa. (S.)
 Milton Manufacturing Co. (The), Milton, Pa. (I.)
 Minnesota Steel Co., Duluth, Minn. (S.)
 Moorhead Brother & Co., Inc., Sharpsburg, Pa. (I., S.)
 National Rolling Mill Co., Vincennes, Ind. (I., S.)
 National Tube Co. of Ohio (The), Lorain, Ohio. (S.)
 Newhall Rolling Mill Co., Philadelphia, Pa. (*idle*; I.)
 Nicetown Plate Washer Co., Philadelphia, Pa. (I.)
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Canada.
 (I., S., R.)
 Ohio Falls Iron Co., New Albany, Ind. (I., S., R.)
 Old Dominion Iron & Nail Works Co., Richmond, Va. (I., S.)
 Oliver Iron & Steel Co., Pittsburgh, Pa. (S.)
 Osage Iron & Steel Co., Sand Springs, Okla. (I., S., R.)
 Pacific Coast Steel Co., San Francisco, Cal. (I., S., R.)
 Pardee (The C.) Works, Perth Amboy, N. J. (S., R.)
 Peck Rolling Mills Co., Ltd. (The), Montreal, P. Q., Canada. (I.,
 S., R.)
 Penn Iron Co., Ltd., Lancaster, Pa. (I.)
 Pennsylvania Steel Co. (The), Philadelphia, Pa. (S.)
 Philadelphia Steel & Forge Co., New York, N. Y. (S.)
 Phoenix Iron Co. (The), Philadelphia, Pa. (S.)
 Pittsburgh Crucible Steel Co., Pittsburgh, Pa. (S.)
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa. (I., S.)
 Portland Rolling Mills, Ltd. (The), St. John, N. B., Canada. (I., S.)
 Port Moody Steel Works, Ltd., Vancouver, B. C., Canada. (S., R.)
 Pullman Co. (The), Pullman, Ill. (I., S.)
 Rail Joint Co., New York, N. Y. (S.)
 Railway Steel-Spring Co., New York, N. Y. (S.)
 Reading Iron Co., Reading, Pa. (I.)
 Redcliff Rolling Mills & Bolt Co., Ltd. (The), Redcliff, Alberta,
 Canada. (I., S., R.)
 Republic Iron & Steel Co., Youngstown, Ohio. (I., S., R.)
 Rockaway Rolling Mill (The), Rockaway, N. J. (I., S.)
 Rome Merchant Iron Mill, Rome, N. Y. (*staybolt and engine bolt*; I.)
 Rudge-Merle Co., San Francisco, Cal. (S., R.)
 St. Louis Screw Co., St. Louis, Mo. (I., S.)
 Schuylkill Haven Rolling Mill, Schuylkill Haven, Pa. (I., S.)
 Scranton Bolt & Nut Co., Scranton, Pa. (I.)
 Sellers Manufacturing Co., Chicago, Ill. (I.)
 Singer Manufacturing Co., Elizabeth, N. J. (*own use*; S.)
 Sligo Steel Co., Connellsville, Pa. (I.)
 Southern California Iron & Steel Co., Los Angeles, Cal. (I., S., R.)

Southern Iron & Commission Co., Birmingham, Ala. (I.)
 Southern Pacific Co., San Francisco, Cal. (I., S.)
 Standard Chain Co., Pittsburgh, Pa. (I.)
 Starr Manufacturing Co., Ltd. (The), Dartmouth, N.S., Canada. (I., S.)
 Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada. (I., S., R.)
 Sweet's Steel Co., Williamsport, Pa. (S., R.)
 Sylvester Co. (The), Danvers, Mass. (I.)
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (S., R.)
 Texas Rolling Mill Co., Fort Worth, Texas. (I., S., R.)
 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.)
 United Steel Co. (The), Canton, Ohio. (S.)
 Upson Nut Co. (The), Cleveland, Ohio. (S.)
 Utah Iron & Steel Co., Midvale, Utah. (I., S., R.)
 Westerman & Co., Lockport, N. Y. (I.)
 Wisconsin Steel Co., Chicago, Ill. (S., R.)
 Wurster (F. W.) & Co., Brooklyn, N. Y. (I., S., R.)
 Youngstown Sheet & Tube Co., Youngstown, Ohio. (S.)

MANUFACTURERS OF TOOL STEEL.

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., South Bethlehem, Pa.
 Braeburn Steel Co., Braeburn, Pa.
 Brown & Co., Inc., Pittsburgh, Pa.
 Carbon Steel Co., Pittsburgh, Pa.
 Carpenter Steel Co., Reading, Pa.
 Chrome Steel Works, Chrome, N. J.
 Colonial Steel Co., Pittsburgh, Pa.
 Columbia Tool Steel Co., Chicago Heights, Ill.
 Crowley (John A.) Co., New York, N. Y.
 Crucible Steel Co. of America, Pittsburgh, Pa.
 Cyclops Steel Works, Titusville, Pa.
 Disston (Henry) & Sons Iron & Steel Works, Philadelphia, Pa.
 Electro Steel Co., Pittsburgh, Pa.
 Farist Steel Co. (The), Bridgeport, Conn.
 Firth-Sterling Steel Co., McKeesport, Pa.
 Halcomb Steel Co., Syracuse, N. Y.
 Heller Brothers Co., Newark, N. J.
 Illingworth (John) Steel Co., Philadelphia, Pa.
 International High Speed Steel Co., New York, N. Y.
 Jessop Steel Co., New York, N. Y.
 Latrobe Electric Steel Co., Latrobe, Pa.

Ludlum Steel Co., Watervliet, N. Y.
McInnes Steel Co., Ltd., Corry, Pa.
Metro Steel Co., Pittsburgh, Pa.
Midvale Steel Co. (The), Philadelphia, Pa.
Pennsylvania Steel Co. (The), Philadelphia, Pa.
Pittsburgh Crucible Steel Co., Pittsburgh, Pa.
Simonds Manufacturing Co., Fitchburg, Mass.
Tivani Electric Steel Co., Ltd., Belleville, Ont., Canada.
Universal Rolling Mill Co., Bridgeville, Pa.
Vanadium Alloys Steel Co., Latrobe, Pa.
Vulcan Crucible Steel Co., Aliquippa, Pa.

MANUFACTURERS OF HORSESHOE BARS AND HORSE-SHOES.

American Horse Shoe Co., Phillipsburg, N. J.
American Steel & Wire Co. (The), Cleveland, Ohio.
Bryden Horse Shoe Co., Catasauqua, Pa.
Burden Iron Co., Troy, N. Y.
Canadian Horse Shoe Co., Ltd., Hamilton, Ont., Canada. (building).
Champion Horse Shoe Co., Pawtucket, R. I.
Cincinnati Horse Shoe & Iron Co. (The), Cleves, Ohio.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Peck Rolling Mills, Ltd. (The), Montreal, P. Q., Canada.
Phoenix Horse Shoe Co., Chicago, Ill.
Portland Rolling Mills, Ltd. (The), St. John, N. B., Canada.
Rhode Island-Perkins Horse Shoe Co., Providence, R. I.
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.

Alberta Rolling Mills Co., Ltd. (The), Medicine Hat, Alberta, Canada.
Altoona Iron Co., Altoona, Pa.
American Electrical Works, Phillipsdale, R. I.
American Tube & Stamping Co., Bridgeport, Conn.
Atlantic Steel Co., Atlanta, Ga.
Carnegie Steel Co., Pittsburgh, Pa.
Clark Steel Hoop Co., Punxsutawney, Pa.
Connors-Weyman Steel Co., Birmingham, Ala.
Fort Wayne Rolling Mill Corp. (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.
Kennedy & Sons, Ltd. (The William), Owen Sound, Ont., Canada.
Laclede Steel Co., St. Louis, Mo.

Lockhart Iron & Steel Co., Pittsburgh, Pa.
 London Rolling Mill Co., Ltd., London, Ont., Canada.
 Phillips Sheet & Tin Plate Co., Weirton, W. Va.
 Pittsburgh Steel Co., Pittsburgh, Pa.
 Port Moody Steel Works, Ltd., Vancouver, B. C., Canada.
 Republic Iron & Steel Co., Youngstown, Ohio.
 Sharon Steel Hoop Co., Sharon, Pa.
 Stanley Works (The), New Britain, Conn.
 Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
 Washburn Wire Co., Phillipsdale, R. I.
 West Leechburg Steel Co., Pittsburgh, Pa.

MANUFACTURERS OF ROLLED LONG ANGLE SPLICE BARS, LONG TIE PLATE BARS, ETC.

Algoma Steel Corporation, Sault Ste. Marie, Ont., Canada.
 American Steel & Tube Co., Lorain, Ohio.
 Ames (W.) & Co., Jersey City, N. J.
 Cambria Steel Co., Philadelphia, Pa.
 Canadian Steel Foundries, Ltd., Montreal, P. Q., Canada.
 Carnegie Steel Co., Pittsburgh, Pa.
 Colorado Fuel & Iron Co., Denver, Col.
 Dilworth, Porter & Co., Ltd., Pittsburgh, Pa.
 Elyria Iron & Steel Co. (The), Cleveland, Ohio.
 Gulf States Steel Co., Birmingham, Ala.
 Illinois Steel Co., Chicago, Ill.
 Inland Steel Co., Chicago, Ill.
 Interstate Iron & Steel Co., Chicago, Ill.
 Jones & Laughlin Steel Co., Pittsburgh, Pa.
 Lackawanna Steel Co., Buffalo, N. Y.
 National Tube Co. of Ohio, (The), Lorain, Ohio.
 Nova Scotia Steel & Coal Co., Ltd., New Glasgow, N. S., Canada.
 Pacific Coast Steel Co., San Francisco, Cal.
 Pennsylvania Steel Co. (The), Philadelphia, Pa.
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa.
 Rail Joint Co., 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.
 Tredegar Co. (The), Richmond, Va.
 Whitaker-Glessner Co., Wheeling, W. Va.
 Williamsport Iron & Nail Co., Williamsport, Pa.

MANUFACTURERS OF IRON AND STEEL SKELP.

(I. = IRON SKELP. S. = STEEL SKELP.)

Alan Wood Iron & Steel Co., Philadelphia, Pa. (I., S.)
 Allegheny Steel Co., Pittsburgh, Pa. (S.)

Brooke (The E. & G.) Iron Co., Birdsboro, Pa. (I.)
 Byers (A. M.) Co., Pittsburgh, Pa. (I.)
 Byers (The A. M.) Co. of Ohio, Girard, Ohio. (I.)
 Carnegie Steel Co., Pittsburgh, Pa. (S.)
 Cohoes Rolling Mill Co., Cohoes, N. Y. (own use; I.)
 Danville Structural Tubing Co., Danville, Pa. (S.)
 Edwards, E. T., Columbia, Pa. (I.)
 Elyria Iron & Steel Co. (The), Cleveland, Ohio. (S.)
 Glasgow Iron Co., Pottstown, Pa. (I.)
 Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa. (S.)
 Illinois Steel Co., Chicago, Ill. (S.)
 Indiana Rolling Mill Co., New Castle, Ind. (S.)
 Jones & Laughlin Steel Co., Pittsburgh, Pa. (S.)
 La Belle Iron Works, Steubenville, Ohio. (S.)
 Lockhart Iron & Steel Co., Pittsburgh, Pa. (I.)
 Logan Iron & Steel Co., Philadelphia, Pa. (I.)
 Moorhead Brother & Co., Inc., Sharpsburg, Pa. (I. & S.)
 National Tube Co., Pittsburgh, Pa. (S.)
 National Tube Co. of Ohio (The), Lorain, Ohio. (S.)
 Newhall Rolling Mill Co., Philadelphia, Pa. (*idle*; I.)
 Parkesburg Iron Co. (The), Parkesburg, Pa. (I.)
 Pittsburgh Forge & Iron Co., Pittsburgh, Pa. (I.)
 Reading Iron Co., Reading, Pa. (own use; I.)
 Reeves Manufacturing Co., Canal Dover, Ohio. (I.)
 Republic Iron & Steel Co., Youngstown, Ohio. (S.)
 Seyfert (Simon) Estate of, Blandon, Pa. (I.)
 Spang, Chalfant & Co., Inc., Pittsburgh, Pa. (I., S.)
 Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada. (I., S.)
 Tyler Tube & Pipe Co. (The), Washington, Pa. (I., S.)
 United Steel Co. (The), Canton, Ohio. (S.)
 Walker, Hervey S., Philadelphia, Pa. (I.)
 Wheeling Steel & Iron Co., Wheeling, W. Va. (I., S.)
 Worth Brothers Co., Philadelphia, Pa. (I.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (I., S.)

MANUFACTURERS OF WROUGHT IRON AND STEEL PIPE.

(I. = IRON PIPE. S. = STEEL PIPE.)

Allegheny Steel Co., Pittsburgh, Pa. (I., S.)
 Byers (A. M.) Co., Pittsburgh, Pa. (I.)
 Canadian Tube & Iron Co., Montreal, P. Q., Canada. (S.)
 Central Tube Co., Pittsburgh, Pa. (S.)
 Cohoes Rolling Mill Co., Cohoes, N. Y. (I.)
 Edwards, E. T., Columbia, Pa. (I.)
 La Belle Iron Works, Steubenville, Ohio. (S.)
 Mark Manufacturing Co., Chicago, Ill. (S.)

Monongahela Tube Co., Pittsburgh, Pa. (I., S.)
 National Tube Co., Pittsburgh, Pa. (S.)
 National Tube Co. of Ohio (The), Lorain, Ohio. (S.)
 Page-Hersey Iron, Tube & Lead Co., Ltd., Toronto, Ont., Canada. (I., S.)
 Parkesburg Iron Co. (The), Parkesburg, Pa. (I.)
 Reading Iron Co., Reading, Pa. (I., S.)
 Republic Iron & Steel Co., Youngstown, Ohio. (S.)
 South Chester Tube Co., Chester, Pa. (I., S.)
 Spang, Chalfant & Co., Inc., Pittsburgh, Pa. (I., S.)
 Steel Company of Canada, Ltd. (The), Hamilton, Ont., Canada. (I., S.)
 Tyler Tube & Pipe Co. (The), Washington, Pa. (I., S.)
 Wheeling Steel & Iron Co., Wheeling, W. Va. (I., S.)
 Worth Brothers Co., Philadelphia, Pa. (I.)
 Youngstown Sheet & Tube Co. (The), Youngstown, Ohio. (I., S.)

MANUFACTURERS OF SEAMLESS STEEL TUBES.

Becker Steel Co. of America, Inc., New York, N. Y.
 Delaware Seamless Tube Co., Auburn, Pa.
 Detroit Seamless Steel Tubes Co., Detroit, Mich.
 Globe Seamless Steel Tubes Co. (The), Milwaukee, Wis.
 Ivins' (Ellwood) Tube Works, Philadelphia, Pa.
 National Tube Co., Pittsburgh, Pa.
 Ohio Seamless Tube Co. (The), Shelby, Ohio.
 Pittsburgh Seamless Tube Co., Beaver Falls, Pa.
 Pittsburgh Steel Products Co., Pittsburgh, Pa.
 Shelby Steel Tube Co., Pittsburgh, Pa.
 Standard Seamless Tube Co., Pittsburgh, Pa. (building).
 Summerill Tubing Co., Bridgeport, Pa. (cold drawn only).
 Timken Roller Bearing Co. (The), Canton, Ohio. (building).

MANUFACTURERS OF WIRE NAILS.

American Steel Co., Pittsburgh, Pa.
 American Steel & Wire Co. (The), Cleveland, Ohio.
 Angell Nail & Chaplet Co., Cleveland, Ohio.
 Atlantic Steel Co., Atlanta, Ga.
 Badger Nail Co. (The), Milwaukee, Wis.
 Baker (Chas. F.) & Co., Boston, Mass.
 Belfont Iron Works, Ironton, Ohio.
 Cambria Steel Co., Philadelphia, Pa.
 Cedarburg Wire & Wire Nail Co., Cedarburg, Wis.
 Clendenin Brothers, Baltimore, Md.
 Colorado Fuel & Iron Co., Denver, Col.
 Consolidated Hardware Manufacturing Co., Ltd., Hamilton, Ont.,
 Canada.
 Crawfordsville Wire & Nail Co., Crawfordsville, Ind.
 Ellwood City Nail Co., Ellwood City, Pa. (cement coated).

Dominion Iron & Steel Co., Ltd., Sydney, N. S., Canada.
Graham Nail Works, Toronto, Ont., Canada.
Grand Crossing Tack Co., Chicago, Ill.
Gulf States Steel Co., Birmingham, Ala.
Hassall (John), Inc., Brooklyn, N. Y.
Igoe Brothers, Inc., Newark, N. J.
Illinois Nail Co., Chicago, Ill.
Imperial Steel & Wire Co. (The), Collingwood, Ont., Canada.
Indiana Steel & Wire Co., Muncie, Ind.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Kelly Nail & Iron Co. (The), Ironton, Ohio.
Keystone Steel & Wire Co., 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., St. John, N. B., Canada.
Merwin Manufacturing Co., Erie, Pa.
Milwaukee Tack Co., Milwaukee, Wis.
Morgan Spring Co., Worcester, Mass.
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., Ltd. (The), Gananoque, Ont., Canada.
Peck Rolling Mills, Ltd. (The), Montreal, P. Q., Canada.
Pender (James) & Co., Ltd., St. John, N. B., Canada.
Penn Hardware Co., Reading, Pa.
Phillips' Pressed Steel Pulley Works, Philadelphia, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Robertson (P. L.) Manufacturing Co., Ltd., Milton, Ont., Canada.
Spencer Wire Co., Worcester, Mass.
Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
Townsend Company, New Brighton, Pa.
Ward Nail Co., Struthers, Ohio.
Washburn Wire Co., Phillipsdale, R. I.
Weatherproofing Nail Co., Baltimore, Md. (special).
Western Wire & Nail Co., London, Ont., Canada.
Wickwire Brothers, Inc., Cortland, N. Y.
Wilson Steel Products Co., Chicago, Ill. (cement coated).
Youngstown Sheet & Tube Co. (The), Youngstown, Ohio.

MANUFACTURERS OF CUT NAILS.

Bishop-Babcock-Becker Co. (The), Cleveland, Ohio.
Brooke (The E. & G.) Iron Co., Birdsboro, Pa.
Clendenin Brothers, Baltimore, Md.
Cobb & Drew, Inc., Plymouth, Mass.

- Consolidated Hardware Mfg. Co., Ltd., Hamilton, Ont., Canada.
(small sizes).
Cowan & Britton, Ltd., Gananoque, Ont., Canada.
Diamond Tack & Nail Works, Raynham, Mass.
Grand Crossing Tack Co., Chicago, Ill.
Kelly Nail & Iron Co. (The), Ironton, Ohio.
La Belle Iron Works, Steubenville, Ohio. ✓
Lessig (George B.) Co., Pottstown, Pa.
Milwaukee Tack Co., Milwaukee, Wis.
Morrisburg Tack Manufacturing Co., Morrisburg, Ont., Canada.
Norton Iron Works, Ashland, Ky.
Peck Rolling Mills, Ltd. (The), Montreal, P. Q., Canada.
Steel Co. of Canada, Ltd. (The), Hamilton, Ont., Canada.
Tower Manufacturing Company, Cincinnati, Ohio. (small sizes).
Tremont Nail Co., West Wareham, Mass.
Van Alen & Co., Northumberland, Pa.
Wheeling Steel & Iron Co., Wheeling, W. Va. —
Williamsport Iron & Nail Co., Williamsport, Pa.

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