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STEEL

ESTABLISHED 1882

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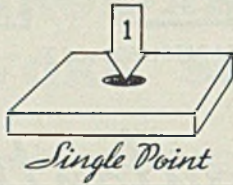


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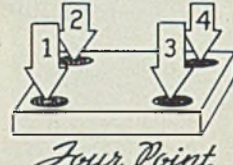
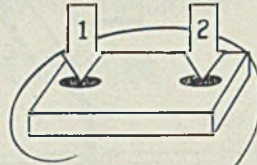
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Modern Cleveland Presses of this series are built in three types: Single Point, Two Point and Four Point, and each of these types can be furnished in sizes and capacities to suit particular requirements.

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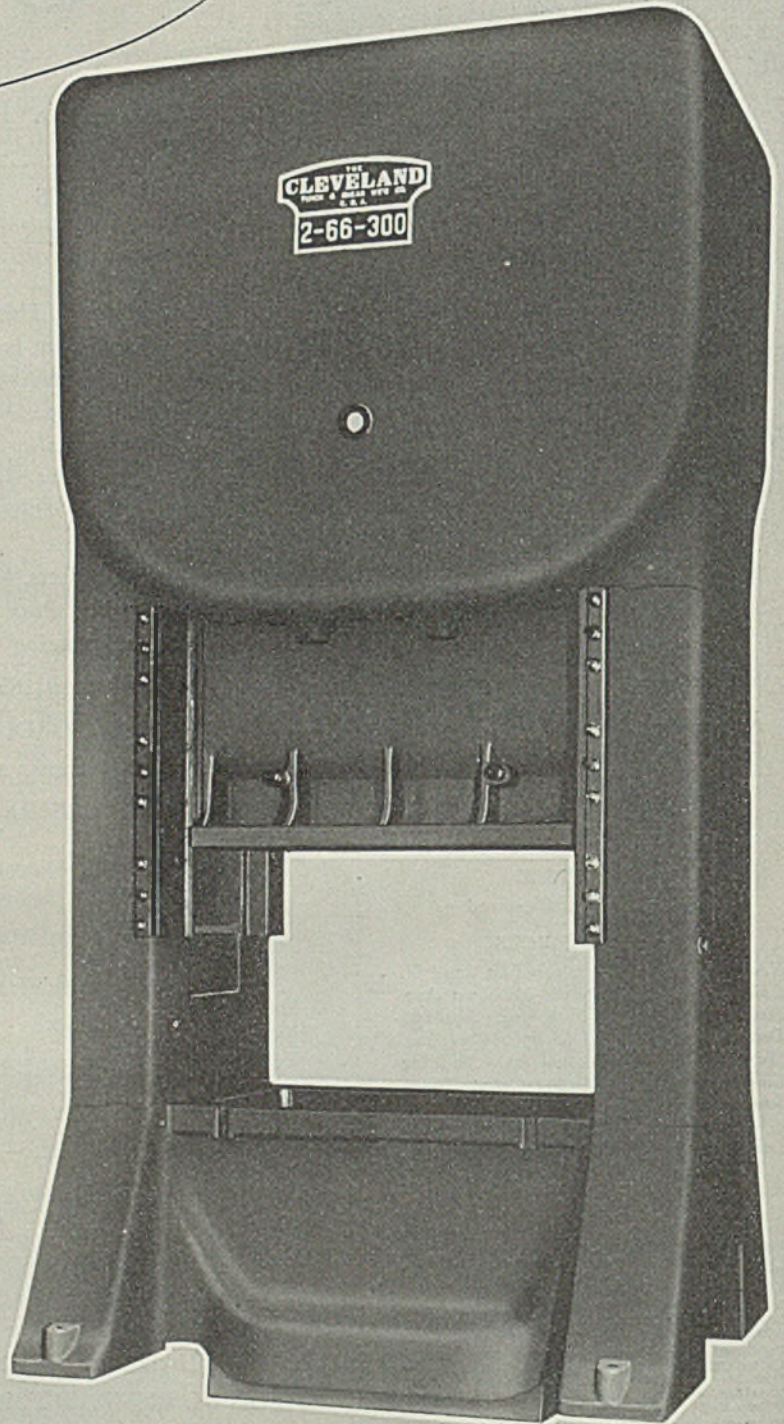
The illustration shows a Cleveland Two Point Press, 66" between the uprights, which exerts a pressure of 300 tons and, like all other Modern Cleveland Presses of this series, the Press is symmetrical front and back, consequently there are no overhanging brackets or other projections.

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HIGHLIGHTING THIS ISSUE



■ FOR THE first time in American history it begins to appear that the prisoner may be adjudged guilty without trial. Informal opinion by Attorney General Jackson (p. 13) is that companies held by the national labor relations board to be in violation of the Wagner act are to be treated as law breakers and ineligible for defense contracts even though appeal to the federal courts is pending. Government "crack-down" on Bethlehem Steel Corp. is hinted as a possibility. . . Are you eager to get defense business? STEEL tells you (p. 34) how to go about selling the army and navy direct. It also lists names of contractors (p. 15) many of whom will need materials, parts and equipment for execution of the contracts.

. . .

Still larger grows the flow of business to the steel mills. In the attempt to speed deliveries the industry lifted its output $\frac{1}{2}$ point last week (p. 21) to 93 $\frac{1}{2}$ per cent of ingot capacity. Consumer anxiety is causing an increase in orders for first quarter delivery (p. 85) at prices prevailing at time of shipment. Increased demands originate not only in defense but in numerous other requirements. Production of 1941 automobiles, for example, is at a much higher rate than a year ago. The Association of American Railroads has recommended purchase of 100,000 additional freight cars before Oct. 1, 1941, to require about 1,000,000 tons of steel. By-product coke prices are rising in anticipation of a shortage.

Output Higher

. . .

Scrap shipments to Japan are being expedited (p. 13) to beat the Oct. 16 deadline. . . T. M. Girdler broadcasts to South America (p. 21) to encourage friendly relations. . . The "draft industry" provision (p. 23) is not to be invoked unless imperatively necessary. . . Pig iron production in September (p. 19) was at the highest daily rate since 1929. . . Carnegie-Illinois Steel Corp. (p. 20) increases its electric

Scrap to Japan

steel capacity. . . Near-capacity operations for the farm implement industry (p. 14) are foreseen for 1941. . . A. H. Allen (p. 27) comments on "slowdowns" initiated by organized labor. . . Many Americans, says STEEL's editor (p. 36), would like more assurance that the defense program is going, as the President says, "awfully well."

. . .

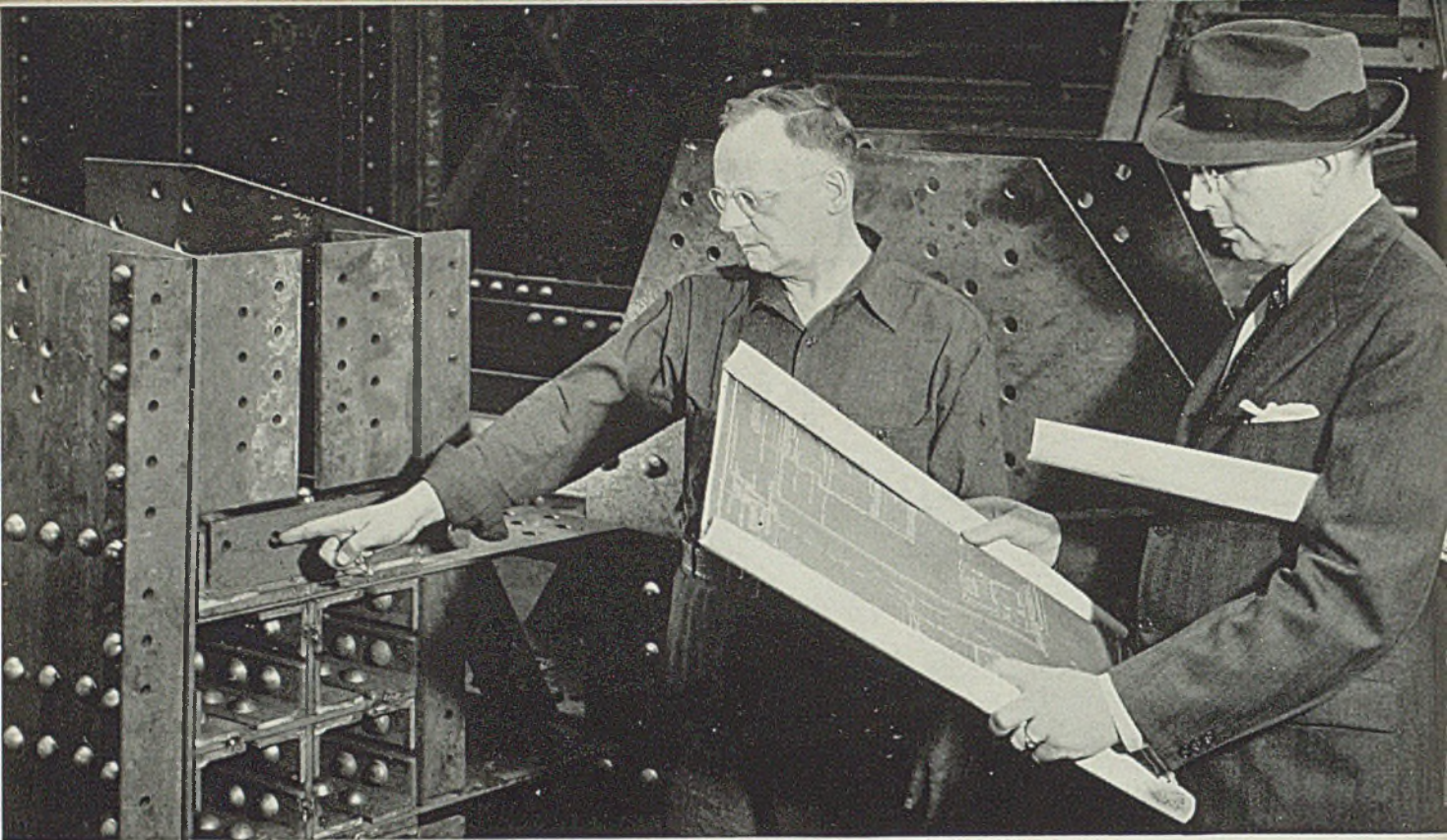
In concluding his discussion of age hardening of cold reduced strip Paul J. McKimm (p. 46) says that the answer is to be found in proper production methods. He declares that "there is no reason to warrant the manufacture of high-cost nonaging grades of steel." His article includes the most complete bibliography on this subject that has been published up to date. . . Highly developed gaging setups are essential (p. 40) in checking gears made to today's specifications. . . Fred B. Jacobs (p. 59) describes procedure at a successful gold plating plant. . . At this time, when the emphasis is on production, many items of new and improved equipment (p. 70) are of special interest.

Checking Gears

. . .

Certain dies used in producing diecastings require extremely high injection pressures, values up to 5000 pounds per square inch being not unusual. A. E. Abbott (p. 42) describes new diecasting machines designed to withstand pressures up to 800,000 pounds. They are made of steel plate with welded joints. They permit casting with less flash, thus reducing finishing costs. The machines also permit greater production with less maintenance cost. . . George Kentis Jr. (p. 64) describes an improved line for producing welded steel tubing of superior quality. . . H. J. Beattie (p. 53) discloses a system that effected a 50 per cent saving in materials handling costs; it is widely applicable.

Welded Tubing

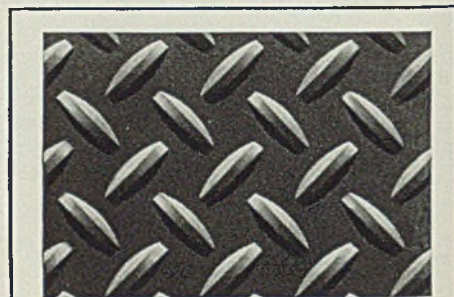


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INLAND STEEL CO.

STRUCTURAL STEEL

Labor Board Ruled To Have Veto Power Over Armament Contracts

Companies Held To Be Wagner Act Violators Ineligible.

Defense Commissioner Tells SWOC "Crackdown" Is Possible.

Excess Profits Tax Bill Enacted, Sent to President.

Army, Navy Awards for Week Aggregate \$522,939,798.09.

WASHINGTON

■ INFORMAL opinion by Attorney General Jackson that companies held by the national labor relations board to be in violation of the Wagner act are to be treated as law breakers and ineligible for defense contracts, even though appeal to a federal court is pending, last week added confusion to the defense program.

The attorney general in a letter to Sidney Hillman, national defense commissioner in charge of labor, said:

"We have given informal consideration to your oral request for advice as to the effect of findings of the national labor relations board that an employer is in violation of the national labor relations act.

"It seems too clear to admit of controversy, though we will prepare a formal opinion if it is requested through the usual channels, that the findings of the national labor relations board that an employer is in violation of the national labor relations act are binding and conclusive upon the other agencies of the executive branch of the government unless and until these findings are reversed by a court of competent jurisdiction."

Now involved in labor board proceedings are a number of important steel and metalworking companies which have been awarded important national defense contracts. The complexities that may result become evident when it is considered that a company held to be a Wagner act violator may appeal and be sustained by a district court. The labor board then may appeal to a circuit court of appeals. If it wins, the company

then might be forced to appeal to the United States Supreme Court. If the Supreme Court reverses the circuit court, the company is eligible for contracts but a year or more of delay in executing the defense program has resulted.

SIDNEY HILLMAN WIRES ENCOURAGEMENT TO SWOC

PITTSBURGH

Sidney Hillman, defense commis-

sioner in charge of labor, last week sent a telegram to the Steel Workers Organizing committee here that a government "crackdown" on Bethlehem Steel Corp. is possible according to a ruling by the attorney general of the United States.

Attending the two-day conference were John L. Lewis, Philip Murray and other leaders in the Congress of Industrial Organizations.

Murray charged that Bethlehem is

Japanese Rush Scrap Shipments



■ Scrap-laden freight cars line docks at Portland, Oreg., awaiting shipment to Japan. With the scrap embargo effective Oct. 16, Japanese vessels are loading bumper cargoes in an effort to transport maximum volume before supplies are cut off. Acme photo

evading a recent order under the Walsh-Healey act. He asserted that although Bethlehem now pays 62½ cents an hour to common labor that this is deducted "from wages rightly belonging to skilled workers through use of a pool system."

EXCESS PROFITS TAX BILL APPROVED BY CONGRESS

WASHINGTON

Congress last week took final action on the excess profits tax bill and it was sent to the President for signature.

In addition to the tax features, the bill provides for the deduction by manufacturers from their taxable income over a five-year period the entire cost of defense production facilities completed after June 10, this year. The bill also suspends present profits limitations on the manufacture of warships and military aircraft.

Bill as finally enacted levies an excess profits tax of 25 to 50 per cent on corporations.

Normal income tax rate on all cor-

porations was increased from 20.9 per cent to 24 per cent. This applies to all corporations with net income of more than \$25,000. No change was made in the tax on corporations with incomes of less than \$25,000.

It has been estimated by tax experts the new bill will yield from \$900,000,000 to a billion dollars annually. Act includes tax schedules designed to prevent any abnormal profits to corporations as a result of the government's defense program.

Invested capital formula adopted provides for the exemption of earnings up to 8 per cent of investment capital from the tax. Also, the first \$5000 of a corporation's earnings are exempt.

All earnings in excess of the exemption and credits would be taxable at 25 per cent on the first \$20,000, 30 per cent on the next \$30,000, 35 per cent on the next \$50,000, 40 per cent on the next \$150,000, 45 per cent on the next \$250,000 and 50 per cent on all over \$500,000.

temporary injunction blocking only consummation of the plan prior to its approval is expected to be settled early this week. Hearings will be held at Jersey City, N. J.

Pointing out the company was not directly dependent upon defense business for the major part of its work, F. B. Hufnagel, chairman, declared the immediate outlook is excellent. Demand, he said, is coming from a broad field.

Third quarter earnings, Mr. Hufnagel said, were decidedly better than in the preceding period, when net income was \$1,211,727 or \$1.87 per common share.

100,000 Added to Steel Payrolls in 12 Months

■ More than 100,000 employes were added by the steel industry between August 1939 and August 1940, according to the American Iron and Steel institute, New York.

August average of employes was 560,000, compared with 549,000 in July and 458,000 in August 1939. Steel payrolls in the month totaled \$83,837,000, against \$82,215,000 in July and \$67,894,000 in August last year.

Wage earning employes in the industry earned an average of 85.1 cents per hour in August, compared with 85.6 cents in July and 84.7 cents in August a year ago. Wage earners averaged 36.7 hours per week in August, 36.5 in July and 36.2 in August 1939.

Unemployment Reduced 7.5 Per Cent in August

■ Total unemployment in the United States declined to 7,657,000 in August from 8,279,000 in July, according to the National Industrial Conference board, New York.

This decline of 622,000 in the number of jobless, or 7.5 per cent, brought the total to the lowest point since November, 1937, and marked a drop of 1,181,000 in unemployment since August, 1939. The total remained more than two and a half million higher, however, than the 1937 low of 5,066,000.

Republic Steel Wins on "Vacation Pay" Issue

■ Third United States circuit court of appeals at Philadelphia last week turned down a request by the national labor relations board that Republic Steel Corp., Cleveland, be required to give reinstated strikers "vacation pay" for the years 1937 through 1940.

The court pointed out that the board's order to reinstate strikers did not include provision for vacation pay and that the court would not expand the order.

Agricultural Implement Industry Anticipates Capacity Year in 1941

■ A NEAR-CAPACITY year for the farm implement industry is in prospect for 1941, according to speakers at the forty-seventh annual convention, Farm Equipment institute, meeting in Chicago last week. Farm buying power for 1940, they said, is the highest since 1918.

Harry G. Davis, research director for the institute, said technological changes in farming methods are reflected in shifts in demand for various types of agricultural equipment and bring about changes in production schedules, particularly for power units and harvesting equipment.

The farm implement industry, he said, is not only developing new machines, but is improving quality and efficiency by new and stronger alloys, finer precision machinery and improved engineering designs.

Despite the war, Mr. Davis said, farm implement exports this year probably will be the best since 1930.

W. C. MacFarlane, president, Minneapolis Moline Power Implement Co., Minneapolis, based a prediction for 1941 capacity operations on the probability that the valleys in implement production will be filled with national defense orders. These are being allotted to take not more than one-third of any company's normal capacity.

Clarence B. Randall, vice president, Inland Steel Co., Chicago, de-

clared the steel industry will be able to meet future requirements of the farm equipment industry despite British and American war business.

New officers elected: H. L. Dempster, president, Dempster Mill Mfg. Co., Beatrice, Nebr., president; William H. Roberts Jr., secretary, S. L. Allen & Co. Inc., Philadelphia, chairman of the executive committee; P. H. Noland, vice president, B. F. Avery & Sons Co., Louisville, Ky., new director. Directors re-elected: B. C. Heacock, president, Caterpillar Tractor Co., Peoria, Ill.; George L. Gillette, vice president, Minneapolis Moline Power Implement Co., Minneapolis; J. H. Oppenheim, vice president, New Idea Inc., Coldwater, O.

Crucible Stockholders Approve Merger

■ Stockholders of Crucible Steel Co. of America, New York, last week voted approval of the company's projected plan to merge with its subsidiary, Pittsburgh Crucible Steel Co., Pittsburgh. Proposed plan effecting a change of capitalization to dispose of arrearage on preferred dividends was also approved. Proposition creating authority for a \$25,000,000 mortgage was tabled.

Action taken by certain preferred stockholders who had obtained a

Defense Awards \$522,939,798;

Ordnance Contracts Heavier

■ **CONTRACTS** announced by the army and navy departments last week aggregated \$522,939,798.09. Outstanding were awards of \$110,628,030.92 to North American Aviation Inc., Inglewood, Calif., and \$99,641,880.83 to the Glenn L. Martin Co., Baltimore, for airplanes. Army ordnance awards continued to show substantial gains.

War department announced the following contracts:

Atlantic Bitulithic Co., Washington, paving and drainage of airplane parking areas, Langley Field, Va., \$138,500.

J. W. Bailey, Seattle, construction and completion of temporary housing (Project No. 4) at Ft. Lewis, Washington, \$92,150.

J. I. Barns, Springfield, O., construction and completion of annexes to warehouses 2, 3 and 4 at Patterson Field, Ohio, \$129,000.

Drake Avery Co., Detroit, construction, installation and completion of pumping and metering equipment at Ft. Custer, Michigan, \$19,805.

Fincher Construction Co., Dallas, Tex., emergency construction at Fort Brown, Texas, \$114,727.

Mion Construction Co., Atlanta, Ga., temporary buildings, Fort Benning, Georgia, \$352,213.

C. J. Moritz Heating Co., St. Louis, heating installation in hangar, Scott Field, Illinois, \$6192.

O'Driscoll & Grove Inc., New York, construction and completion of temporary housing at Westover Field, Massachusetts, \$479,479.

Myron S. Roberts, Tehachapi, Calif., barracks and other buildings at Muroc lake, California, \$51,448.76.

S. O. Yarbrough & Geo. T. Reinhardt, Austin, Tex., emergency construction at Fort Sam Houston, Texas, \$592,867.

Aircraft Awards

Continental Motors Corp., Muskegon, Mich., airplane engines, \$4,727,542.82.

Curtiss Wright Corp., St. Louis Airplane division, Robertson, Mo., airplanes, \$45,646,882; Curtiss Airplane division, Buffalo, airplanes, \$43,514,819.50.

Glenn L. Martin Co., Baltimore, airplanes, \$99,641,880.83.

North American Aviation Inc., Inglewood, Calif., airplanes, \$110,628,030.92.

Signal Corps Awards

American Steel & Wire Co., Worcester, Mass., submarine mine cable, \$50,820.

Anaconda Wire & Cable Co., Marion, Ind., submarine mine cable, \$138,000.

Climax Engineering Co., Clinton, Iowa, power units, \$65,512.50.

Elcor Inc., Chicago, dynamometer units, \$191,520.

General Cable Corp., Perth Amboy, N. J., submarine mine cable, \$47,160.

The North Electric Mfg. Co., Gallion, O., head and chest sets, \$192,312.

Okonite Co., Passaic, N. J., submarine mine cable, \$109,860.

Phelps Dodge Copper Products Corp., Habirshaw Cable division, Yonkers, N. Y., submarine mine cable, \$109,640.

Radio Receptor Co. Inc., New York, rectifier power equipment for radio sets, \$25,354.75.

Rauland Corp., Chicago, radio receiving and transmitting equipment, \$372,596.

Simplex Wire & Cable Co., Cambridge, Mass., submarine mine cable, \$195,340.

Weston Electrical Instrument Corp., Newark, N. J., test sets, \$104,069.

Quartermaster Corps Awards

Allen Boat Co. Inc., Gretna, La., steel tug (diesel), \$40,450.

Aluminum Cooking Utensil Co., New Kensington, Pa., mess utensils, \$10,901.

Aluminum Goods Mfg. Co., Manitowoc, Wis., mess utensils, \$8274.56.

Austin Construction Co., Dallas, Tex., paving and drainage of runway at Barksdale Field, Louisiana, \$206,666.

Collins Electric Co., Stockton, Calif., electric distribution and street lighting system at Stockton airport, California, \$14,931.

Dickie Construction Co., St. Louis, temporary housing at Scott Field, Ill., \$1,082,214.

Fred J. Early Jr. Co., San Francisco, air corps hangar and miscellaneous ordnance buildings at Albrook Field, Canal Zone, \$437,707.

General Motors Corp., Detroit, trucks, \$4345.30.

Goode Construction Co., Charleston, N. C., and Atlanta, Ga., construction buildings, structure, utilities, and appurtenances, air port, Savannah, Ga., cost plus fixed fee contract. (Negotiated), \$1,550,113.

O. P. Graham, Richmond, Va., temporary housing at Virginia Beach rifle range, Va., \$423,640.

Hettrick Mfg. Co., Toledo, O., material for carriers, wire cutters, \$1900.88.

King-Taggart Corp., New York, temporary housing at Fort Jay, New York, \$49,322.

MacDonald Construction Co., St. Louis, officers' quarters at Corozal, Canal Zone, \$383,549.

Mack-Int. Motor Truck Corp., Long Island City, N. Y., dump trucks, \$201,960.

McDonald & Kahn, San Francisco, temporary housing at Hamilton field, California, \$343,000.

Metallite Mfg. Co., Los Angeles, mess utensils, \$5715.

Neu-Bart Stamping & Mfg. Co., Los Angeles, mess utensils, \$4248.

Palmer Scott Co. Inc., New Bedford, Mass., motor launches, \$44,250.

Reeves Steel & Mfg. Co., Dover, O., parts for field ranges, \$78.

Reo Motor Car Co., Lansing, Mich., trucks, \$71,660.

Robinson Marine Construction Co. Inc., Benton Harbor, Mich., motor launches, \$47,000.

Stewart Motor Co., Washington, trucks, \$13,411.17.

Stewart-Warner Corp., Indianapolis, parts for field ranges, \$107.

Tucker McClure & Thompson Markham Co., Los Angeles, headquarters building at Fort Kobbe and at Ft. Clayton, Canal Zone, \$56,000.

Wackman Welded Ware Co., St. Louis, tent stoves, \$39,600.

Wheeling Corrugating Co., Wheeling, W. Va., parts for tent stoves, \$23,486.40.

Ordnance Department Awards

American Brass Co., Waterbury Conn., small arms ammunition components, \$529,606.

American La-France Foamite Corp., Elmira, N. Y., fire trucks, \$17,170.

American Tube Bending Co. Inc., New Haven, Conn., spare parts for radial engines, \$23,171.25.

Barber-Colman Co., Rockford, Ill., machinery, \$7225.

Barker Tool, Die & Gauge Co., Detroit, gages, \$15,743.

Bausch & Lomb Optical Co., Rochester, N. Y., fire control equipment and binoculars, \$1,019,052.12.

Bell & Howell Co., Chicago, fire control equipment, \$152,733.65.

E. Bers & Co., Philadelphia, antimony alloy lead, \$28,250.

H. Brinton Co., Philadelphia, aiming posts, \$23,078.

Brown & Sharpe Mfg. Co., Providence, R. I., gages, \$2066.20.

Budd Wheel Co., Detroit, ammunition components, brake drums and hub assemblies, \$1,019,052.12.

Byron Jackson Co., Los Angeles, artillery material, \$2,643,709.88.

Carboloy Co. Inc., Detroit, small arms ammunition, \$1276.91.

Chase Brass & Copper Co., Waterbury, Conn., small arms ammunition components, \$106,734.50.

Chelsea Clock Co., Chelsea, Mass., clocks and carrying cases, \$8,354.15.

Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, machinery and grinders, \$3780.

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., small arms material, \$20,805.

Continental Motors Corp., Aircraft Engine division, Muskegon, Mich., spare parts for radial engines and engines, \$255,711.74.

Doehler Die Casting Co., Pottstown, Pa., ammunition components, \$28,900.

Dover Boiler Works, Dover, N. J., nitro-tors, \$1080.

E. L. Essley Machinery Co., Chicago, riveting machines, \$1081.

Eastern Tool & Mfg. Co., Bloomfield, N. J., ammunition components, \$43,500.

Eastman Kodak Co., Rochester, N. Y., fire control equipment, \$105,946.20.

Electric Arc Cutting & Welding Co., Newark, N. J., generating units, \$106,835.

Etched Products Corp., Long Island City, N. Y., fire control equipment, \$20,420.

Federal Products Corp., Providence, R. I., gages, \$3200.

General Electric Co., Schenectady, N. Y., machinery, \$1975.

General Motors Corp., Detroit, ammunition components, \$9,505,600.

General Time Instruments Corp., La Salle, Ill., ammunition components, \$35,298.

Glascote Products Inc., Cleveland, condensers, \$1440.

Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$1834.58.

Hanson-Whitney Machine Co., Hartford, Conn., gages, \$8060.71.

Hardinge Brothers Inc., Elmira, N. Y., lathes, \$4143.75.

Hires, Castner & Harris Inc., Philadelphia, machinery, \$15,385.

R. Hoe & Co., New York, artillery material, \$3,014,750.

Interstate Mechanical Laboratories, New York, gages, \$8940.

W. F. & John Barnes, Rockford, Ill., drilling machines, \$13,680.

John A. Connelly, Philadelphia, machinery, \$12,294.

John Bath & Co. Inc., Worcester, Mass., gages, \$1333.55.

Johnson Tool & Engineering Inc., Dayton, O., gages, \$1934.50.

Kilby Steel Co., Anniston, Ala., ammunition components, \$694,000.

Kincaid Co. Inc., New York, parts for small arms, \$4077.80.

Lincoln Park Tool & Gage Co., Lincoln Park, Mich., gages, \$5660.

Lundquist Tools & Mfg. Co., Worcester, Mass., telescope mounts, \$28,798.

Marshall & Huschart Machinery Co., Milwaukee, machines, \$3489.

McLaren Screw Products Co., Detroit, ammunition components, \$6973.62.

Miller Printing Machinery Co., Pittsburgh, artillery material, \$1,736,941.

Mines Equipment Co., St. Louis, fire control equipment, \$11,004.

Mohawk Machine & Tool Co., New York, gages, \$1380.

National Lead Co., Atlantic Branch-Metal division, New York, antimony alloy lead, \$20,480.

National Pneumatic Co., Rahway, N. J., ammunition components, \$154,020.

Penn Instrument Works Inc., Philadelphia, gages, \$1230.

Pennsylvania Tool & Mfg. Co., York, Pa., gages, \$14,641.

Pettibone Mulliken Corp., Chicago, artillery material, \$3,817,884.

Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., drilling machines, gages, \$166,447.94.

Precise Tool & Mfg. Co., Farmington, Mich., gages, \$13,343.

Penn Instrument Works, Inc., Philadelphia, gages, \$2765.

Elpe Machinery Co., Cleveland, gages, \$1065.

R. & M. Mfg. Co., Royal Oak, Mich., gages, \$1012.

Remington Arms Co. Inc., Bridgeport, Conn., small arms ammunition components, \$2626.40.

Revere Copper & Brass, Inc., Baltimore, small arms ammunition components, \$389,557.50.

Robertshaw Thermostat Co., Youngwood, Pa., ammunition components, \$431,819.78.

Geo. T. Schmidt Co. Inc., Chicago, machinery, \$1380.

Scovill Mfg. Co., Waterbury, Conn., ammunition components, \$360,000.

Sears Saddlery Co., Davenport, Iowa, helmets, \$3770.55.

Sheffield Gage Corp., Dayton, O., gages, \$7885.

Sperry Gyroscope Co., Brooklyn, N. Y., fire control equipment, \$2,942,825.80.

Standard Forgings Co., Chicago, ammunition components, \$624,000.

Standard Gage Co. Inc., Poughkeepsie, N. Y., gages, \$7638.40.

L. S. Starrett Co., Athol, Mass., gages, \$4041.42.

Stedfast & Roulston Inc., agents for the G. A. Gray Co., Cincinnati, milling machines, \$59,909.17.

Taft Pierce Co., Woonsocket, R. I., gages, \$1047.20.

Tools & Gages Inc., Cleveland, gages, \$2497.

Troy Tool & Gage Co., Detroit, gages, \$18,659.

Uchtorff Co., Davenport, Iowa, helmets, \$34,367.54.

J. C. Ulmer Co., Cleveland, gages, \$10,689.

Union Parts Mfg. Co. Inc., Brooklyn, N. Y., ammunition components, \$10,168.

Vinco Corp., Detroit, gages, \$17,369.95.

Walworth Co., Kewanee, Ill., ammunition components, \$1,664,250.

Warner Electric Brake Mfg. Co., Beloit, Wis., electric brake wheel units and accessories, \$30,076.81.

S. K. Wellman Co., Cleveland, facings and rivets, \$21,010.24.

West & Dodge Thread Gage Co., Boston, gages, \$1042.54.

Western Cartridge Co., East Alton, Ill., ammunition, \$1,117,500.

Western Felt Works, Chicago, ammunition components, \$1,035.42.

Wiedemann Machine Co., Philadelphia, Pa., gages, \$2755.

William Sellers & Co. Inc., Philadelphia, double housing planners, \$36,675.

Winchester Repeating Arms Co., New Haven, Conn., ammunition components, \$1200.

Navy department announced the following yards and docks awards:

James E. Cassidy Inc., Cambridge, Mass., additional improvements to heating system, building H-1, at naval hospital, Portsmouth, N. H., \$8278.

Harnischfeger Corp., Milwaukee, electric overhead traveling cranes for navy yards, \$175,388.

R. C. Huffman Construction Co., Buffalo, dredging submarine basin at naval station, Key West, Fla., \$107,691, estimated.

Philadelphia Transportation Co., Philadelphia, repairs to trolley loop at Philadelphia navy yard, \$3980.

Portland Elevator Co. Inc., Boston, freight elevator, \$18,000.

William P. Neil, Los Angeles, ammunition storage facilities at Hawthorne, Nev., \$2,146,000.

Bureau of Supplies and Accounts Awards

American Car & Foundry Co., Berwick, Pa., tanks, with spare parts, \$38,356,773.

American Locomotive Co., New York, artillery material, \$3,132,800.

American Steel & Wire Co., Cleveland,

electric cable, \$184,292.10.

Atlantic-Pacific Mfg. Corp., Brooklyn, N. Y., life floats, \$77,500.

Atlas Ansonia Co., New Haven, Conn., steel rollers, \$6776.

Autocor Co., Ardmore, Pa., half track personnel carriers, \$9,581,406.

Bethlehem Steel Co., Bethlehem, Pa., target towing hawsers, \$105,828.94.

Brown Instrument Co., Philadelphia, indicators, switches, \$11,564.21.

Buffalo Pumps Inc., Buffalo, pumps,

\$8230.

Chase Brass & Copper Co., Waterbury, Conn., artillery ammunition components, \$806,000.

Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling machines, \$91,661.68.

Cincinnati Shaper Co., Cincinnati, shearing machines, \$16,248.

Circle Wire & Cable Corp., Maspeth, Long Island, N. Y., cable and wire,

\$5309.10.

Purchases Under Walsh-Healey Act

Iron and Steel Products

A. L. Cahn & Sons Inc., New York	Aero Supply Mfg. Co. Inc., Corry, Pa.	Aetna-Standard Engineering Co., Youngstown, O.	Allegheny Ludlum Steel Corp., Brackenridge, Pa.	American Cast Iron Pipe Co., Birmingham, Ala.	American Chain & Cable Co. Inc., Wilkes-Barre, Pa.	American Steel & Wire Co., Cleveland	American Steel Foundries, Chicago	Atwater Mfg. Co., Plantsville, Conn.	Auto Specialties Mfg. Co., St. Joseph, Mich.	Baldt Anchor, Chain & Forge Corp., Chester, Pa.	Bethlehem Steel Co., Bethlehem, Pa.	Boyle Mfg. Co., Los Angeles	Breeze Corporations Inc., Newark, N. J.	Budd Wheel Co., Detroit	Buffalo Bolt Co., North Tonawanda, N. Y.	Builders Iron Foundry, Providence, R. I.	Carnegie-Illinois Steel Corp., Pittsburgh	Commercial Shearing & Stamping Co., Youngstown, O.	Crane Co., Chicago	Crucible Steel Co. of America, New York	Detroit-Michigan Stove Co., Detroit	Doehler Die Casting Co., Pottstown, Pa.	Eastern Rolling Mill Co., Baltimore	Edwards Mfg Co., Cincinnati	Electro Metallurgical Sales Corp., New York	Gary Steel Products Corp., Norfolk, Va.	Inland Steel Co., Chicago	Manco Mfg. Co., Bradley, Ill.	Murray Mfg. Corp., Brooklyn, N. Y.	National Forge & Ordnance Co., Irvine, Pa.	National Machine Products Co., Detroit	National Tube Co., Pittsburgh	North & Judd Mfg. Co., New Britain, Conn.	Parker Appliance Co., Cleveland	Pennsylvania Forge Corp., Philadelphia	Pheoll Mfg. Co., Chicago	Phillips & Davies Inc., Kenton, O.	Pollak Mfg. Co., Arlington, N. J.	Pratt Industries Inc., Frankfort, N. Y.	Republic Steel Corp., Cleveland	Richard S. Danforth, San Francisco	Rochester Ropes Inc., Jamaica, N. Y.	Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.	Southern Pipe & Casing Co., Azusa, Calif.	Standard Nut & Bolt Co., Valley Falls, R. I.	Stewart-Warner Corp., Indianapolis	Taylor-Wharton Iron & Steel Co., Easton, Pa.	United States Pipe & Foundry Co., New York
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United States Steel Export Co., New York

Universal Crusher Co., Cedar Rapids, Iowa	Vanadium Alloys Steel Co., Latrobe, Pa.	Waterbury Buckle Co., Waterbury, Conn.	Welker Mfg. Co. Inc., Cromwell, Conn.	Wheeling Corrugating Co., Wheeling, W. Va.	Wildin Metal Goods Co., Garwood, N. J.	William Scrimgeour, Washington	Wright Aeronautical Corp., Paterson, N. J.	York Safe & Lock Co., York, Pa.	Youngstown Sheet & Tube Co., Youngstown, O.
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Nonferrous Metals and Alloys

Aluminum Co. of America, Pittsburgh	American Brass Co., Waterbury, Conn.	American Emblem Co. Inc., New Hartford, N. Y.	American Hollow Boring Co., Erie, Pa.	American Non-Gran Bronze Corp., Berwyn, Pa.	Bohn Aluminum & Brass Corp., Detroit	Chase Brass & Copper Co., Waterbury, Conn.	Fairmont Aluminum Co., Fairmont, W. Va.	International Nickel Co. Inc., New York
Magna Mfg. Co. Inc., Haskell, N. J.	Mueller Brass Co., Port Huron, Mich.	New Jersey Zinc Sales Co. Inc., New York	Northwest Lead Co., Seattle	Pollak Mfg. Co., Arlington, N. J.				

Commodity

Commodity	Amount
Funnels, ladles	\$15,180.00
Steel	18,228.94
Gun carriages	1,703,050.24
Cast-iron pipe	32,433.28
Steel, cable	42,150.00
Steel, cable	27,000.00
Steel castings	57,790.33
Nose plugs	17,040.84
Shells	24,526.50
Wire rope, rivet steel	1,653,750.00
Barrels	95,100.00
Doors	47,246.33
Shells	31,120.00
Bolts	12,206.00
Telescope mounts	309,282.69
Steel	10,140.35
Super-structures	29,501.00
Steel pipe	127,782.65
Forgings, steel	27,781.90
Army ranges	147,805.20
Ogives	197,219.07
Steel	117,375.00
Metal caskets	71,518.70
Ferromanganese	14,442.32
Mooring buoys	44,160.00
Corrugated roofing	13,377.60
Reel units	15,990.00
Shells	92,747.50
Forgings	62,900.00
Nuts	902,000.00
Steel tubing	117,925.00
Buckles	21,504.28
Joint fittings	40,868.64
Forgings	11,513.16
Screws and nuts	17,914.50
Service gates	109,025.00
Manifold assemblies	64,528.68
Steel tubes	18,500.00
Steel	98,233.64
Wire rope	13,950.00
Boots, nuts	21,053.57
Steel pipe	40,824.00
Bolts	27,692.28
Range, fire units	52,911.46
Gas cylinders	36,290.17
Pipe, plumbing supplies	13,664.24
Deck supports, shapes	11,838.05
Cradle assemblies	21,167.00
Tool steel	182,703.27
Buckles	397,723.22
Buckles	92,400.00
Hoods	18,107.03
Mast bases	11,625.00
Knives, utensils	12,227.96
Nuts, bolts, washers	23,486.40
Cradle assemblies	235,999.50
Steel	25,988.75
Tanks, alloys	16,511.08
Bullet cups	66,945.75
Silver badges	10,083.67
Copper cylinders	\$97,638.33
Bushing	85,880.00
Bushing	22,209.75
Brass rods	133,311.36
Aluminum alloy	11,194.24
Copper-nickel cylinders, alloys	18,896.00
Magnesium	19,447.80
Brass forgings	100,000.00
Zinc	217,147.76
Lead	27,750.00
Fuses	49,750.00
	15,700.00
	18,480.00
	349,760.00

Collyer Insulated Wire Co., Paw-tucket, R. I., cable, \$170,224.41.
 Consolidated Machine Tool Corp., Rochester, N. Y., engine lathes, \$193,580.
 Continental Motors Corp., Muskegon, Mich., engines, \$6,694,940.
 Crane Co., Chicago, pipe fittings, \$10,668.19.
 Diamond T Motor Car Co., Chicago, half track personnel carriers, \$14,220,000.
 Duplex Printing Co., Battle Creek,

Mich., artillery material, \$6,097,440.
 Eastern Rolling Mill Co., Baltimore, artillery ammunition components, \$1,883,000.
 Electric Auto-Lite Co., Toledo, O., artillery ammunition components, \$780,000.
 Electric Products Co., Cleveland, welding control panels, \$8208.
 Elwell-Parker Electric Co., Cleveland, crane truck, \$5755.
 General Cable Corp., New York, elec-

tric cable, \$154,890.98.
 General Electric Co., Schenectady, N. Y., electric cable, \$28,550.90.
 General Machinery Corp., Niles Tool Works division, Hamilton, O., armor planers, \$571,200.
 General Motors Corp., Anderson, Ind., artillery ammunition components, \$3,593,500.
 General Motors Corp., Cleveland Diesel Engine division, Cleveland, main and auxiliary engine, \$10,116.19.
 General Motors Corp., Dayton, O., artillery ammunition components, \$1,208,199.68.
 Gisholt Machine Co., Madison, Wis., balancing machine, \$9080.
 Independent Lock Co., Fitchburg, Mass., artillery ammunition components, \$965,000.
 International Nickel Co. Inc., New York, nickel-copper alloy, \$37,722.73.
 Kearney & Trecker Corp., Milwaukee, milling machines, \$7159.70.
 Kennedy Valve Mfg. Co., Elmira, N. Y., pipe fittings, \$17,656.85.
 Kollsman Instrument division of Square D Co., Elmhurst, N. Y., aircraft compasses, \$85,811.
 Landis Tool Co., Waynesboro, Pa., grinding machine, \$9970.64.
 Lloyd & Arms Inc., Philadelphia, lathes, \$34,781.
 Lodge & Shipley Machine Tool Co., Cincinnati, precision lathes, \$23,255.
 Lukens Steel Co., Coatesville, Pa., steel plates, \$82,945.60.
 Mine Safety Appliances Co., Pittsburgh, breathing apparatus, \$27,396.
 Monarch Machine Tool Co., Sidney, O., engine lathes, \$153,284.03.
 Mueller Co., Columbian Iron Works, Chattanooga, Tenn., artillery ammunition components, \$1,008,655.
 National Malleable Steel & Casting Co., Cleveland, artillery ammunition components, \$1,470,000.
 National Supply Co., Ambridge, Pa., artillery ammunition components, \$720,000.
 Norris Stamping & Mfg. Co., Los Angeles, artillery ammunition components, \$2,544,000.
 Okonite Co., Passaic, N. J., electric cable, \$206,642.08.
 Omaha Steel Works, Omaha, Nebr., artillery ammunition components, \$2,462,500.
 Pennsylvania Forge Corp., Philadelphia, artillery ammunition components, \$790,000.
 Perkins Marine Lamp & Hardware Corp., Brooklyn, N. Y., lamps, lanterns, lights, and globes, \$19,977.20.
 Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire division, New York, electric cable, \$29,083.
 Pratt & Whitney division, Niles-Bement-Pond Co., West Hartford, Conn., jig boring machine, \$6935.
 Pressed Steel Car Co., Chicago, artillery ammunition components, \$2,191,090.
 Pressed Steel Car Co., Pittsburgh, artillery ammunition components, \$1,230,000.
 Pullman-Standard Car Mfg. Co., Butler, Pa., artillery ammunition components, \$1,134,000.
 Pullman-Standard Car Mfg. Co., Chicago, artillery material, \$5,775,575.
 RCA Mfg. Co., Camden, N. J., sound motion picture equipment, \$34,467.40.
 Reed-Prentice Corp., Worcester, Mass., engine lathes, \$29,988.
 Rockbestos Products Corp., New Haven, Conn., electric cable, \$198,033.05.
 Rockford Machine Tool Co., Rockford, Ill., slotter machines, \$69,085.50.
 Schweitzer-Cummins Co., Indianapolis, artillery ammunition components, \$1,596,695.
 Scovill Mfg. Co., Waterbury, Conn., artillery ammunition components, \$2,358,000.
 Sculler Safety Corp., New York, life floats, \$119,850.
 Seagrave Corp., Columbus, O., fire engines, \$87,080.
 Sheffield Steel Corp., Kansas City, Mo., bolts and nuts, \$47,124.19.
 W. E. Shipley Machinery Co., Philadelphia, toolmakers' lathes, \$7067.50.

Purchases Under Walsh-Healey Act (Cont.)

Revere Copper & Brass Inc., New York	Sheet, tubes, nozzles	\$116,866.36
Reynolds Metals Co., Louisville, Ky.	Aluminum strip	13,033.29
Scovill Mfg. Co., Philadelphia	5-Cent blanks	106,000.00
Waltham Watch Co., Waltham, Mass.	Springs	21,250.00
Whitehead Metal Products Co. Inc., Cambridge, Mass.	Nickel copper alloy	16,504.66
Machinery and Other Equipment		
Allis-Chalmers Mfg. Co., Milwaukee	Turbine, graders	\$595,327.95
American Chain & Cable Co., Inc., Bridgeport, Conn.	Hoists	46,146.72
American Laundry Machinery Co., Cincinnati	Laundry equipment	49,819.00
Austin-Hastings Co. Inc., Cambridge, Mass.	Planer	45,725.60
Baldwin Locomotive Works, Philadelphia	Hydraulic jacks	394,600.00
Bass Engineering & Construction Co., Detroit	Water treatment system	17,361.00
Brown & Sharpe Mfg. Co., Providence, R. I.	Machines	43,069.41
Carey Machinery Supply Co., Baltimore	Lathes	10,622.35
Chain Belt Co., Milwaukee	Pumping machines	28,373.00
Chicago Pneumatic Tool Co., Philadelphia	Pneumatic drills	14,761.20
Cincinnati Mill. Mach. & Cinc. Grinders Inc., Cincinnati	Milling, grinding machines	44,301.66
Cleveland Twist Drill Co., Cleveland	Twist drills	15,144.00
Consolidated Machine Tool Co., Rochester, N. Y.	Lathes	87,960.00
Conveyor Engineering & Supplies Corp., Clifton, N. J.	Conveyors	13,332.00
Eaton Mfg. Co., Detroit	Valve seats	76,781.20
Erie Foundry Co., Erie, Pa.	Forging hammer	27,570.00
Ex-Cell-O Corp., Detroit	Grinder	12,307.36
Fred J. Early Jr. Co., San Francisco	Pumping plant	21,663.00
G. A. Gray Co., Cincinnati	Planer	45,913.00
General Machinery Corp., Hamilton, O.	Lathes	588,598.00
Gisholt Machine Co., Madison, Wis.	Lathes	32,205.92
Greenfield Tap & Die Corp., Greenfield, Mass.	Gages	60,969.90
Harding Brothers Inc., Elmira, N. Y.	Lathes	10,856.10
Harnischfeger Corp., Milwaukee	Bridge cranes	21,985.00
Herman Nelson Corp., Moline, Ill.	Targets	13,631.76
Ingersoll-Rand Co., New York	Exhausters, air compressors	853,515.00
International Harvester Co., Chicago	Tractors	18,185.36
Kearney & Trecker Corp., Milwaukee	Milling machines	63,876.70
Kingsbury Machine Tool Corp., Keene, N. H.	Drilling, tapping machines	87,435.00
Landis Machine Co., Waynesboro, Pa.	Tapper machines	16,857.40
Leece-Neville Co., Cleveland	Diesel engine parts	10,810.00
Lidgerwood Mfg. Co., Elizabeth, N. J.	Steering gears	846,755.00
Lloyd & Arms Inc., Philadelphia	Lathes	14,670.00
Micro-Westco Inc., Bettendorf, Iowa	Grinder	21,119.15
Modern Tool & Die Co., Philadelphia	Gages	32,220.00
Monarch Machine Tool Co., Sidney, O.	Lathes	11,785.00
Moore Special Tool Co., Bridgeport, Conn.	Jigs, fixtures	10,801.00
Murphy Elevator Co., Louisville, Ky.	Elevators	34,444.00
Nordberg Mfg. Co., Milwaukee	Air compressor	55,521.00
Pomona Pump Co., Pomona, Calif.	Pumps	40,976.00
Pratt & Whitney division, Niles-Bement-Pond Co., West Hartford, Conn.	Borer machines	19,440.00
R. & M. Mfg. Co., Royal Oak, Mich.	Gages	10,015.70
R. K. LeBlond Machine Tool Co., Atlanta, Ga.	Lathes	13,054.20
R. L. Harris Inc., Knoxville, Tenn.	Hauling equipment	102,400.00
R. S. Armstrong & Bros. Co., Atlanta, Ga.	Lathes	20,884.35
Reed-Prentice Corp., Worcester, Mass.	Lathes	17,168.00
Sager-Spuck Supply Co. Inc., Albany, N. Y.	Shaper	15,981.00
Salvage Process Corp., New York	Cleaning outfit	26,400.00
Schutte & Koerting Co., Philadelphia	Water pumps	24,772.00
Sebastian Lathe Co., Cincinnati	Lathes	143,041.25
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.	Bridge cranes	227,940.00
SKF Industries Inc., Philadelphia	Bearings	32,373.55
Smith-Courtney Co., Richmond, Va.	Steam hammer	11,500.00
South Bend Lathe Works, South Bend, Ind.	Engine lathes	101,565.85
St. Joe Machines Inc., St. Joseph, Mich.	Tumblers	16,905.00
F. J. Stokes Machine Co., Philadelphia	Pellet machine	29,481.00
Universal Gear Corp., Indianapolis	Gear boxes	19,475.00
Vandeyk Churchill Co., Philadelphia	Boring machine	12,270.00
Veit & Young, Philadelphia	Punches and dies	12,165.00
Wadell Engineering Co., Newark, N. J.	Boring fixtures	11,193.47
Watson-Stillman Co., Roselle, N. J.	Pumps	18,500.00
W. F. & John Barnes Co., Rockford, Ill.	Spindle heads	30,365.00
W. E. Shipley Machinery Co., Philadelphia	Lathes	40,280.40
William Scrimgeour, Washington	Food machines	23,307.36
Woodward Governor Co., Rockford, Ill.	Governor	25,500.00
Worthington Pump & Machinery Corp., Harrison, N. J.	Pump units	116,604.00
GRAND TOTAL		\$15,834,160.26

A. O. Smith Corp., Milwaukee, artillery ammunition components, \$3,561,500.
 Stewart Warner Corp., Chicago, artillery ammunition components, \$1,381,600.
 Superior Valve & Fittings Co., Pittsburgh, cylinder valves, \$19,846.02.
 United Aircraft Corp., Hamilton Standard Propellers division, East Hartford, Conn., propeller blades, \$34,837.80.
 Utica Cutlery Co., Utica, N. Y., boning knives, \$8218.
 Van Norman Machine Tool Co., Springfield, Mass., milling machines, \$20,612.
 Ward LaFrance Truck Corp., Elmira, N. Y., trucks, \$629,901.
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., welding sets, \$22,692.
 White Motor Co., Cleveland, half track cars and scout cars, \$34,451,249.80.
 Winner Mfg. Co. Inc., Trenton, N. J., life floats, \$151,125.

Canadian War Contracts For Week, \$28,081,023

TORONTO, ONT.

■ Contracts totaling \$28,081,023 were announced last week by C. D. Howe, minister of munitions and supply. All were placed with Canadian companies. Construction projects accounted for \$11,955,868 and mechanical transport for \$10,593,683.

The awards:

Mechanical Transport: Ford Motor Co. of Canada Ltd., Windsor, \$4,793,588; General Motors Products of Canada Ltd., Oshawa, Ont., \$4,344,556; Ross, Cycle & Sports, Toronto, \$346,534; Chrysler Corp. of Canada Ltd., Windsor, \$334,460; Dominion Truck Equipment Co. Ltd., Kitchener, Ont., \$61,646; International Harvester Co. of Canada Ltd., Ottawa, \$244,760; Pierre Thibault, Pierreville, Que., \$49,200; department of transport, Ottawa, \$25,575.

Aircraft Supplies: Canadian Vickers Ltd., Montreal, \$31,045; Canadian Wright Ltd., Montreal, \$240,103; Starratt Airways & Transportation Ltd., Hudson, Ont., \$19,500; Goodyear Tire & Rubber Co. of Canada Ltd., New Toronto, Ont., \$20,867; National Steel Car Corp. Ltd., Malton, Ont., \$12,882; Firestone Tire & Rubber Co. of Canada Ltd., Hamilton, \$7312; Canadian Goodrich Co. Ltd., \$6172.

Shipbuilding: Meteghan Shipbuilding Co. Ltd., Meteghan, N. S., \$51,000; Gordon Boat Works, Bobcaygeon, Ont., \$6912.

Dockyard Supplies: Anglo-Canadian Wire Rope Co. Ltd., Montreal, \$29,716; Dominion Wire Rope & Cable Co. Ltd., Montreal, \$14,858; Horton Steel Works Ltd., Toronto, \$52,990; The B. Greening Wire Co. Ltd., Hamilton, Ont., \$23,692; Metal Industries Ltd., Hamilton, \$7200.

Instruments: Ontario Hughes-Owens Co. Ltd., Ottawa, \$124,360; United States Gauge Co., Montreal, \$10,893; Instruments Ltd., Ottawa, \$20,261.

Electrical Equipment: British admiralty, England, \$13,500; war office, England, \$28,000; Canada Wire & Cable Co. Ltd., Montreal, \$9806; Dominion Engineering Co. Ltd., Montreal, \$85,023; General Supply Co. of Canada Ltd., Ottawa, \$18,404.

Machinery: Pleasville Foundry, Pleasville, Que., \$31,014; Rudel Machinery Co. Ltd., Montreal, \$28,359; T. E. Ryder Machinery Co., Montreal, \$26,380; Williams & Wilson Ltd., Montreal, \$6197; Canadian Fairbanks-Morse Co. Ltd., Ottawa, \$6544; George W. Crothers Ltd., Leaside, Ont., \$20,800; Brunner Corp. (Canada) Ltd., Toronto, \$34,214; Canadian Ramapo Iron Works Ltd., Niagara Falls, Ont., \$5500; DeVilbiss Mfg. Co. Ltd., Windsor, \$5368; Railway & Power

Engineering Corp. Ltd., Toronto, \$25,182.

Fire Fighting Equipment: Canadian Johns-Manville Corp. Ltd., Montreal, \$12,690; La France Fire Engine & Foamite Ltd., Toronto, \$21,279.

Ordnance: Accessories Manufacturers Ltd., Montreal, \$19,975.

Miscellaneous: Dominion Wire Rope & Cable Co. Ltd., Montreal, \$19,540; B. Greening Wire Co. Ltd., Hamilton, \$26,600; Canada Wood Specialty Mfg. Co. Ltd., Orillia, Ont., \$13,900; C. Beck Co., Ltd., Penetanguishene, Ont., \$13,899.

Construction: M. F. Schurman Co. Ltd., Summerside, P. E. I., \$372,205; Acme Construction Co. Ltd., St. John, N. B., \$386,729; R. A. Corbett Co. Ltd., St. John, N. B., \$30,944; Anglin-Norcross (Quebec) Ltd., Quebec, Que., \$2,500,000; Carter-Halls-Aldinger Co. Ltd., Montreal, \$920,000; Dominion Bridge Co. Ltd., Lachine, Que., \$133,000; George C. Abbott Ltd., Toronto, \$60,355; Ontario Electric Construction Co. Ltd., Toronto, \$43,420; A. W. Robertson Ltd., Toronto, \$1,097,600; Brennan Paving Co. Ltd., Hamilton, \$30,450; R. Timms Construction Ltd., Welland, Ont., \$305,512; Carter-Halls-Aldinger Co. Ltd., Cranberry, Man., \$880,000; W. C. Wells, Wilkie, Sask., \$447,227; Pool Construction Co. Ltd., Edmonton, Alta., \$920,000; Bennett & White Construction Co. Ltd., Calgary, Alta., \$773,728; North-

ern Construction Co. and J. W. Stewart Ltd., Vancouver, B. C., \$63,800; Acme Construction Co. Ltd., St. John, N. B., \$372,000; Coast Construction Co., Vancouver, B. C., \$195,000; Storms Contracting Co., Toronto, \$337,000; Northern Construction Co. and J. W. Stewart, Ltd., Vancouver, B. C., \$175,000; Frontenac Construction Co., Toronto, \$114,000; National Contracting Co., Prince Albert, Sask., \$47,000; H. J. MacDonald, Edmonton, Alta., \$236,600; Bird Construction Co., Winnipeg, \$792,600; Milne & Nicholls, Toronto, \$350,000.

"Free Economy Vital To Free People"—Block

■ Citing pre-war conditions in the totalitarian nations, Germany and Italy, as a warning of what befalls a people become too indolent to preserve its individual liberties, Joseph L. Block last week asserted that to preserve our personal rights we must also preserve a free economy. Executive vice president, Inland Steel Co., Chicago, Mr. Block addressed the Catholic Youth congress, meeting in Chicago, on "Business and Democracy."

Contrasting rigid control exercised over every person under dictatorial government with the wide latitude of freedom permitted in America, Mr. Block called upon the youth of this nation to aid in preserving democracy. Only under America's traditional system of free enterprise, he pointed out, is opportunity for the individual to rise "from the bottom to the top rung of the ladder" made available. And this regardless of race, creed or class.

Mr. Block explained Hitler's rise to power came with the support of many prominent German business leaders. These men, he declared, gave their support to Hitler after Germany's economic structure faced imminent collapse brought on by innumerable crises in the preceding 15 years. Fearing destruction by communism, they turned to Hitler and unwittingly brought upon themselves eventual complete regimentation.

Discussing beneficial results attendant upon operation of a free, democratic economy, Mr. Block opposed arbitrary controls of price competition. "There do not live," he said, "men so wise that they can create and administer a detailed system of prices which will meet with the approval of even a small fraction of those concerned. Such details can only be maintained through complete dictatorship . . ."

■ Less than 0.25 per cent of the world's tin supply is mined in North America and only 12 per cent in South America, according to an analytical review prepared by W. A. Janssen, chief of the metals and minerals division, department of commerce.

Steel and Gravitation



■ Two steel balls of identical weight and size apparently disproved one of the rules of gravitation by rolling at different speeds down an incline. Dr. Phillips Thomas, research engineer for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., performed the experiment to demonstrate how the friction of tiny particles of loosely packed tungsten powder inside one of the balls made it "lazy" by absorbing part of its energy. Engineers have used this principle of energy absorption to prevent electrical relay contacts bouncing apart when they are closed, thus eliminating sparking and reducing wear on electrical control equipment

Daily Pig Iron Average in September Near Record Figure

■ COKE PIG iron production rate in United States increased to near-record heights in September, with average daily output for the month 139,085 net tons, highest since May, 1929, when daily average was 140,840 tons. It exceeded that of any September since this publication started compiling monthly pig iron production statistics in 1918.

Increase in average daily production over August's 136,599 tons was 2486 tons or 1.82 per cent. September was the fifth consecutive month to register an increase in daily output over the month preceding. Daily production last month was nearly 33 per cent greater than in April, this year's low, when average was 104,635 tons per day. Average daily production for the month compared with 107,298 tons in September last year; 62,835

MONTHLY IRON PRODUCTION

Net Tons

	1940	1939	1938
Jan.....	4,024,556	2,436,474	1,618,245
Feb.....	3,304,368	2,307,405	1,463,093
March....	3,270,575	2,680,446	1,646,636
April.....	3,139,043	2,301,965	1,554,569
May.....	3,497,157	1,923,625	1,412,249
June.....	3,813,092	2,373,753	1,188,037
July.....	4,060,513	2,638,760	1,358,645
Aug.....	4,234,576	2,979,774	1,674,976
Sept.....	4,172,551	3,218,940	1,885,069
Tot. 9 mo.	33,516,431	22,861,142	13,801,519
Oct.....	.....	4,062,670	2,315,599
Nov.....	.....	4,166,512	2,561,060
Dec.....	.....	4,219,718	2,478,244
Total...	.....	35,310,042	21,156,422

for the month in 1938 and 127,604 in September, 1937.

With 83.1 per cent of all stacks active last month, according to reports from operators of the nation's 231 potential blast furnaces, the pig iron operating rate advanced 1.6 points to 91.5 per cent of capacity. This exceeded the previous high, 90.3 per cent, attained last November, and is said to approach actual practical capacity. Operating rate in September, 1939, was 69.7 per cent; in 1938 it was 40.5 per cent for September; for the month in 1937, 83.7 per cent.

September's total production, 4,172,551 tons, was 62,025 tons or 1.5 per cent less than in August, when output aggregated 4,234,576 tons, because the latter was one day longer. Production last month was also curtailed somewhat at several plants due to banking of furnaces for Labor day.

Although last month's output was

AVERAGE DAILY PRODUCTION

	Net Tons			
	1940	1939	1938	1937
Jan.....	129,825	78,596	52,201	116,327
Feb.....	113,943	82,407	52,254	120,800
March....	105,502	86,465	53,117	125,385
April.....	104,635	76,732	51,819	126,956
May.....	112,811	62,052	45,556	128,083
June.....	127,103	79,125	39,601	116,304
July.....	130,984	85,121	43,827	126,501
Aug.....	136,599	96,122	54,031	130,677
Sept.....	139,085	107,298	62,835	127,604
Oct.....	.....	131,053	74,697	104,450
Nov.....	.....	138,883	85,369	74,929
Dec.....	.....	136,119	79,943	54,319
Ave.....	122,323	96,740	57,962	112,642

less than in the period preceding, it was the highest total for any September since monthly compilations were started in 1918. It compared with 3,218,940 tons in the month last year, 3,828,115 tons in September, 1937; and 3,916,028 tons in September, 1929. Latter total was the previous high for the month.

Production in the first nine months this year aggregated 33,516,431 tons, nearly 50 per cent greater than in the 1939 period, when it totaled 22,861,142 tons. In the first nine months of 1937, however, aggregate output was slightly greater, totaling 33,944,520 tons.

Daily average production for the nine months was 122,323 tons, 46 per cent higher than in the 1939 period, when it was 83,740 tons, but less than 124,339 tons, average for the first nine months in 1937.

Stacks in blast Sept. 30 totaled 192, two more than were active at the end of August, and highest since July, 1937, when the same number were in blast. This was the highest total since October, 1929, when 203

SEPTEMBER IRON PRODUCTION

	Net Tons			
	No. in blast last day of		—Total Tonnages—	
	Sept.	Aug.	Merchant	Non-merchant
Alabama ...	18	18	118,700	179,326
Illinois ...	16	14	74,879	309,058
Indiana ...	17	17	0	473,297
New York ...	13	13	93,896	192,267
Ohio ...	43	42	138,038	807,162*
Penna. ...	63	64	109,089*	1,183,043*
Colorado ...	3	3		
Michigan ...	4	4		
Minnesota ...	2	2	0	176,433
Tennessee ...	0	0		
Utah ...	1	1		
Kentucky ...	2	2		
Maryland ...	6	6		
Mass. ...	1	1	14,834	302,529
Virginia ...	0	0		
West Va. ...	3	3		
Total ...	192	190	549,436*	3,623,115*

*Includes ferromanganese and spiegeleisen.

furnaces were in blast and monthly output aggregated 4,018,724 tons. Furnaces active in September, a year ago, totaled 169; in the 1938 period, 97; in September, 1937, 181; and 204 in September, 1929. One hundred ninety were active in August, 187 in July, 181 in June and 152 in March, the lowest for 1940.

Three furnaces were put in blast last month and one was blown out. Two merchant furnaces resumed and none were blown out. In the steelworks or nonmerchant classification, one furnace resumed and one was blown out. Furnaces resuming in September:

In Illinois: Federal A and B, Interlake Iron Corp. In Ohio: Mingo No. 3, Carnegie-Illinois Steel Corp.

Bethlehem D, Bethlehem Steel Co., in Pennsylvania, was blown out.

RATE OF FURNACE OPERATION

(Relation of Production to Capacity)

	1940 ¹	1939 ²	1938 ³	1937 ⁴
Jan.....	85.4	51.0	33.6	76.6
Feb.....	75.0	53.5	33.6	79.5
March....	69.5	56.1	34.2	82.5
April.....	68.9	49.8	33.4	83.7
May.....	74.2	40.2	29.4	84.3
June.....	83.6	51.4	25.5	76.6
July.....	86.1	55.0	28.2	82.9
Aug.....	89.9	62.4	34.8	85.7
Sept.....	91.5	69.7	40.5	83.7
Oct.....	.....	85.2	48.0	68.4
Nov.....	.....	90.3	55.0	49.3
Dec.....	.....	88.5	51.4	35.6

¹Based on capacity of 55,628,060 net tons, Dec. 31, 1939; ²capacity of 56,222,790 net tons, Dec. 31, 1938; ³capacity of 56,679,168 net tons, Dec. 31, 1937; ⁴first six months on capacity of 55,454,265 net tons, Dec. 31, 1936—last six months on capacity of 55,695,065 net tons, June 30, 1937. Capacities by American Iron and Steel Institute.

Personnel Changes Announced by J & L

■ Lamar J. Vieau has been appointed assistant district sales manager, New York office, Jones & Laughlin Steel Corp., Pittsburgh. He formerly was general sales manager for McKeesport Tin Plate Corp., McKeesport, Pa. Julius Graf, formerly vice president, Treadwell Construction Co., New York, has been named assistant chief engineer for Jones & Laughlin. C. F. Seyler has been made assistant chief engineer of plants.

■ Illinois Institute of Technology, Chicago, has installed a new air conditioning and refrigeration laboratory through co-operation of several prominent Chicago concerns. The laboratory, valued at \$5000, is equipped for studying problems of air conditioning and refrigeration. It was installed under direction of James C. Peebles, professor of experimental engineering and a member of the staff of Armour Research Foundation.

August Steel Exports 22.6 Per Cent of Output

■ Total output of steel products for sale in August was 4,649,065 net tons against 4,173,839 tons in July, according to the American Iron and Steel Institute. Sales for export during August amounted to 1,053,110 tons, or 22.6 per cent of the total, the highest in many years and perhaps since the World war.

In the first eight months this year the total production for sale was 29,516,435 tons, of which 4,671,545 tons

was for export, or 15.8 per cent.

August production of sheets was 924,801 tons, capacity being estimated at 13,255,610 tons annually, or 1,104,634 tons monthly. Steel bar production was 815,339 tons, with an annual capacity of 12,372,465 tons, or 1,031,039 tons monthly. Output of plates was 386,999 tons, or 74.9 per cent of capacity.

Total of steel items produced for sale, less shipments to members of the industry for conversion into further finished products for August was 4,414,935 tons, or 96.6 per cent of finishing capacity; for the year up

to Sept. 1, 27,970,129 tons, or 77.8 per cent of finishing capacity.

Carnegie Illinois Adds Electric Steel Capacity

■ Carnegie-Illinois Steel Corp. will increase its annual electric furnace steel capacity by approximately 100,000 net tons with the installation of two electric furnaces at its South Chicago, Ill., works. Work has begun on installation. One is a 60-ton furnace rated at 15,000 kilowatts, and the other a 30-ton unit rated at 10,000 kilowatts.

AMERICAN IRON AND STEEL INSTITUTE													August - 1940	
Capacity and Production for Sale of Iron and Steel Products														
STEEL PRODUCTS	Number of Companies	Items	Annual Capacity Net tons	PRODUCTION FOR SALE—NET TONS										
				Current Month			To Date (8 Months 1940)							
				Total	Per cent of capacity	Export	Shipments	Total	Per cent of capacity	Export	Shipments			
				To members of the industry for conversion into further finished products				To members of the industry for conversion into further finished products						
Ingot, blooms, billets, slabs, sheet bars, etc.	34	1	xxxxxxx	686,513	xxx	440,486	100,071	3,261,106	xxx	1,516,122	715,711			
Heavy structural shapes	3	2	5,205,300	350,781	75.0	80,321	xxxxxxx	1,771,155	51.0	229,892	xxxxxxx			
Steel piling	4	3	328,000	19,804	71.3	223	xxxxxxx	111,833	51.1	9,598	xxxxxxx			
Plates—Sheared and Universal	20	4	6,095,450	386,999	74.9	62,293	2,211	2,512,771	61.8	374,440	14,475			
Skelp	3	5	90,685	90,685	xxx	23,557	28,649	466,973	xxx	80,054	173,583			
Rails—Standard (over 60 lbs.)	4	6	3,647,600	115,985	37.5	60,731	xxxxxxx	1,140,741	46.9	143,626	xxxxxxx			
Light (60 lbs. and under)	6	7	306,800	13,285	51.1	5,258	xxxxxxx	73,635	36.0	23,384	xxxxxxx			
All other (Incl. girder, guard, etc.)	2	8	118,000	1,141	11.4	-	xxxxxxx	18,042	22.9	2,382	xxxxxxx			
Splice bar and tie plates	15	9	1,300,200	22,374	20.3	360	xxxxxxx	376,261	43.4	6,509	xxxxxxx			
Bars—Merchant	35	10	xxxxxxx	491,029	xxx	125,484	35,670	2,830,904	xxx	401,259	219,207			
Concrete reinforcing—New billet	15	11	xxxxxxx	127,632	xxx	20,894	xxxxxxx	810,918	xxx	108,530	xxxxxxx			
Rolling	18	12	xxxxxxx	13,819	xxx	592	xxxxxxx	95,698	xxx	5,109	xxxxxxx			
Cold finished—Carbon	18	13	xxxxxxx	61,206	xxx	2,021	xxxxxxx	422,128	xxx	10,591	xxxxxxx			
Alloy—Hot rolled	15	14	xxxxxxx	103,447	xxx	14,900	7,196	596,358	xxx	48,704	41,213			
Cold finished	15	15	xxxxxxx	8,803	xxx	480	xxxxxxx	58,817	xxx	1,972	xxxxxxx			
Hoops and baling bands	5	16	xxxxxxx	9,403	xxx	859	xxxxxxx	69,458	xxx	6,567	xxxxxxx			
TOTAL BARS	54	17	12,372,465	815,339	77.8	165,230	42,866	4,894,261	59.2	662,782	260,420			
Tool steel bars (rolled and forged)	15	18	110,220	6,331	67.8	694	xxxxxxx	44,532	60.6	3,601	xxxxxxx			
Pipe and tube—B. W.	13	19	1,815,860	110,705	71.9	5,469	xxxxxxx	650,808	53.8	50,459	xxxxxxx			
L. W.	10	20	1,246,340	34,070	32.3	1,805	xxxxxxx	226,658	27.3	22,931	xxxxxxx			
Electric weld	5	21	735,520	31,211	50.1	5,199	xxxxxxx	186,079	37.9	20,005	xxxxxxx			
Seamless	15	22	3,159,840	138,280	51.6	12,238	xxxxxxx	1,141,001	54.2	113,960	xxxxxxx			
Conduit	6	23	151,145	7,470	58.3	322	xxxxxxx	45,530	45.2	1,367	xxxxxxx			
Mechanical Tubing	13	24	554,825	25,459	54.2	2,402	xxxxxxx	178,029	48.1	12,867	xxxxxxx			
Wire rods	19	25	xxxxxxx	137,056	xxx	60,424	17,965	741,211	xxx	226,294	116,203			
Wire—Drawn	37	26	2,255,210	140,010	73.3	18,480	838	911,935	60.6	113,101	7,076			
Nails and staples	19	27	1,091,690	55,113	59.6	4,470	xxxxxxx	396,055	54.4	44,663	xxxxxxx			
Barbed and twisted	16	28	439,270	15,359	41.4	4,371	xxxxxxx	136,726	46.8	30,943	xxxxxxx			
Woven wire fence	15	29	772,790	13,298	20.3	154	xxxxxxx	163,278	31.7	1,560	xxxxxxx			
Bale ties	11	30	119,050	9,298	92.2	-	xxxxxxx	48,513	61.1	144	xxxxxxx			
All other wire products	6	31	27,030	2,050	89.5	-	xxxxxxx	10,300	57.1	-	xxxxxxx			
Fence posts	13	32	147,485	4,153	33.2	202	xxxxxxx	37,049	37.7	692	xxxxxxx			
Black plate	12	33	653,295	24,813	44.8	3,449	293	243,332	55.9	33,431	55,963			
Tin plate—Hot rolled	9	34	1,201,960	31,809	31.2	3,548	xxxxxxx	320,360	41.0	70,929	xxxxxxx			
Cold reduced	10	35	2,930,860	211,721	85.3	16,955	xxxxxxx	1,579,724	80.8	253,990	xxxxxxx			
Sheets—Hot rolled	26	36	xxxxxxx	539,028	xxx	45,317	9,345	3,495,909	xxx	352,504	95,290			
Galvanized	16	37	xxxxxxx	131,925	xxx	12,834	xxxxxxx	834,648	xxx	111,514	xxxxxxx			
Cold rolled	18	38	xxxxxxx	201,597	xxx	4,204	xxxxxxx	1,441,492	xxx	56,518	xxxxxxx			
All other	15	39	xxxxxxx	52,251	xxx	2,249	xxxxxxx	373,000	xxx	16,835	xxxxxxx			
TOTAL SHEETS	27	40	13,255,610	924,801	82.3	64,604	9,345	6,195,049	70.1	537,371	95,290			
Strip—Hot rolled	24	41	3,525,110	136,899	45.8	7,613	25,842	911,813	38.8	55,641	107,580			
Cold rolled	35	42	1,313,360	72,336	65.0	1,870	xxxxxxx	462,497	52.8	11,789	xxxxxxx			
Wheels (car. rolled steel)	5	43	424,385	15,533	46.0	23	xxxxxxx	124,320	43.9	2,439	xxxxxxx			
Axles	5	44	472,280	8,492	21.2	58	xxxxxxx	55,824	17.7	1,777	xxxxxxx			
Track spikes	11	45	327,275	7,696	28.8	296	xxxxxxx	74,202	34.0	2,787	xxxxxxx			
All other	3	46	9,100	1,196	155.1	-	xxxxxxx	6,812	112.3	-	xxxxxxx			
TOTAL STEEL PRODUCTS	134	47	4,649,065	815,339	77.8	165,230	42,866	4,894,261	59.2	662,782	260,420			
Estimated total steel finishing capacity based on a yield from ingots of	68.9 %	-	48	53,946,300	xxxxxxx	96.6	xxxxx	xxxxxxx	xxxxxxx	77.8	xxxxxxx	xxxxxxx		
Pig iron, ferro manganese and spiegel	26	49	xxxxxxx	536,667	xxx	100,681	119,948	3,590,343	xxx	369,783	949,272			
Ingot moulds	4	50	xxxxxxx	52,003	xxx	477	xxxxxxx	288,467	xxx	2,433	xxxxxxx			
Bars	10	51	160,600	3,316	24.4	-	64	19,517	19.2	105	1,505			
Pipe and tubes	3	52	109,377	4,134	44.6	104	xxxxxxx	25,732	35.3	685	xxxxxxx			
All other	3	53	71,180	728	12.1	83	85	7,989	16.8	1,560	2,103			
TOTAL IRON PRODUCTS (ITEMS 51 to 53)	12	54	276,247	8,178	34.9	187	150	53,238	28.9	2,350	3,603			

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current month **4,414,935 N.T.** **96.6 %** of Finishing Capacity.
To date **27,970,129 N.T.** **77.8 %** of Finishing Capacity.
The above tonnages represent **68.2 %** of the ingots produced by companies whose products are included above.

Total Number of Companies Included - 153

Lighting Developments Discussed with Editors

Under sponsorship of General Electric Co.'s lamp department an editorial lighting conference was held at Nela Park, Cleveland, Sept. 30, attended by 37 editors representing leading business papers.

Dr. M. Luckiesh struck the keynote when he said artificial light no longer should be thought of as "something which competes with darkness," but rather as "something which competes with daylight." He pointed to an increasing number of windowless buildings.

Office, industrial, store, school, home, street and automobile lighting and wiring were discussed, with practical demonstrations of recent developments. These developments ranged from a 1000-watt water-cooled lamp no larger than a pencil, to large diameter fluorescent tubes 6 or 8 feet long. Importance of the latter in commercial lighting was emphasized, but it was made clear that they are not likely to bring about any revolution in domestic lighting in the immediate future. The incandescent bulb can be counted upon for a long time to be the most important source of artificial light, according to the General Electric authorities.

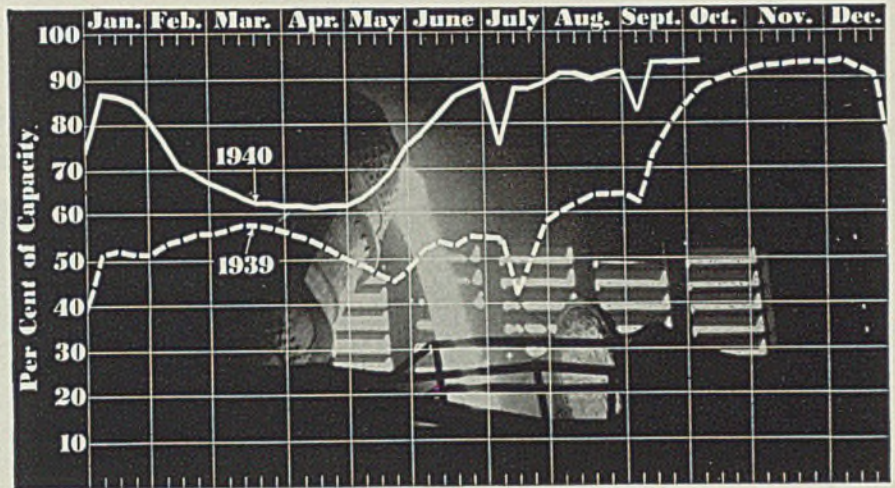
One of the principal addresses was delivered by Dr. Zay Jeffries, who defended vigorously the policy of co-operative research and development by large organizations. He predicted that despite rather discouraging political interference such a policy is destined to go on and that it will prove to be not only one of the keys to normal prosperity but also one of the most important factors in national defense.

August Truck Freight 11% Ahead of 1939

Volume of revenue freight transported by motor truck in August was 4.6 per cent larger than in July, and 11.1 per cent above August, 1939, according to American Trucking Associations Inc., Washington. Returns from 223 motor carriers in 38 states showed an aggregate of 1,373,013 tons transported in August, against 1,312,067 tons in July and 1,236,150 tons in August last year.

The association's index figure, based on the 1936 monthly average of the reporting carriers as 100, stood at 139.82 for August. It was 133.75 in July; in August a year ago, 126.02.

Iron and steel products represented 3.8 per cent of the total reported tonnage. Volume of these commodities increased 12.5 per cent over July and 30.7 per cent over August, 1939.



PRODUCTION... Up

STEELWORKS operations last week advanced $\frac{1}{2}$ -point to 93 $\frac{1}{2}$ per cent, the highest rate this year. Six districts made small gains, one reduced its rate and five were unchanged. A year ago the rate was 87 $\frac{1}{2}$ per cent; two years ago it was 48 $\frac{1}{2}$ per cent.

Detroit—Steady at 94 per cent with only two open hearths idle, one being nearly ready for lighting.

Cincinnati—Increase of 2 points to 90 per cent, highest level this year, with backlogs indicating continuance.

Birmingham, Ala.—Unchanged at 97 per cent for third consecutive week, with 23 open hearths active.

St. Louis—Addition of one open hearth by an East Side mill raised the rate 2 $\frac{1}{2}$ points to 82 $\frac{1}{2}$ per cent.

Buffalo—Continues at 90 $\frac{1}{2}$ per cent for the seventh consecutive week, with orders still exceeding output.

Pittsburgh—Drop of 1 point to 87 $\frac{1}{2}$ per cent, as repairs closed some equipment.

Wheeling—Holds at 97 per cent for the third week.

New England—Gained 3 points to 88 per cent, all but two units operating, with schedules sensitive to furnace repairs.

Chicago—Rose 1 $\frac{1}{2}$ points to 97 $\frac{1}{2}$ per cent. Several open hearths

down for repairs were replaced in service. Interlake Iron Co. has re-lighted a second blast furnace.

Youngstown, O.—Addition of two open hearths by Republic Steel Corp. lifted the rate 1 point to 85 per cent, with indications of 87 per cent this week.

Central eastern seaboard—Sustained at 92 per cent with most mills at capacity.

Cleveland—Up 2 points to 88 per cent.

Girdler Broadcasts To South America

T. M. Girdler, chairman, Republic Steel Corp., extended greetings to citizens of South America Oct. 1 in a recorded broadcast direct to South America over General Electric Co.'s station WGEO, Schenectady, N. Y.

The talk, then repeated in Spanish, was the opening feature of a series of 13 Republic Steel programs to be broadcast in Spanish to South America over station WGEO.

"You and I have a common citizenship," Girdler said. "We are citizens of the Western Hemisphere. That gives us a community of interest which in these days of deep troubles throughout many parts of the world, takes on an importance greater than ever before. . . From South America come many raw materials needed in the factories and mills of the United States, and the finished products of these factories and mills add to the joys and comforts of life in South America.

"To all the people in the great and promising countries of South America I send every kind wish for their continued peace and prosperity."

District Steel Rates

District	Percentage of Ingot Capacity Engaged		In Leading Districts	
	Week ended Oct. 5	Change	1939	1938
Pittsburgh . . .	87.5	— 1	83	37
Chicago	97.5	+ 1.5	86	44.5
Eastern Pa. . . .	92	None	64	33
Youngstown . . .	85	+ 1	90	55
Wheeling	97	None	93	54
Cleveland	88	+ 2	89	51
Buffalo	90.5	None	83.5	51
Birmingham . .	97	None	86	57
New England . . .	88	+ 3	100	65
Cincinnati	90	+ 2	84	43
St. Louis	82.5	+ 2.5	72	45.5
Detroit	94	None	100	72
Average	93.5	+ 0.5	87.5	48.5

Windows of WASHINGTON



By L. M. LAMM

Washington Editor, STEEL

*President Retains Final Authority on "Draft Industry."
Asks Defense Procurement Remain on Voluntary Basis.
Bill Providing Latin-American Loans Becomes Law.
Seek Amendments to Wage-Hour Record-Keeping Rules.*

■ IT WILL be recalled that in the recently enacted conscription act there is a provision for drafting industry in case of necessity. Last week the President expressed a wish to maintain indefinitely procurement of defense materials on a purely voluntary basis and sent identical letters to the secretary of war and the secretary of the navy revealing his desire that any possible invocation of the mandatory draft industry provision "be presented to the advisory commission of the council of national defense for review."

In a letter on this subject to the secretary of war and the secretary of the navy, the president said:

"With reference to section 9 of the selective service and training act of 1940 (Public No. 783-seventy-sixth congress), which gives me various powers to act through you in addition to the present authorized methods of purchase or procurement, it is my desire, in order to provide for uniformity in the negotiation and placing of mandatory orders under section 9, that all such orders proposed to be placed by you under this section be presented to the advisory commission to the council of national defense for review.

"Your proposal when so transmitted should contain your conclusion that action under section 9 is necessary, together with the reasons therefor, the views of the army and navy munitions board with reference to all aspects of the matter within its purview, a statement that the product or material desired is nor-

mally produced or capable of being produced by the person involved, a statement that the price of the material or product desired as determined by you is reasonable and a statement of the preference over other contracts or orders to which the proposed order should be entitled. There should also be attached to the proposal all other documents relating to the case.

Retains Final Authority

"If the commission, with the voluntary co-operation of industry, is unable to effect a solution in a manner satisfactory to you, it shall return the case to you with such recommendations as it may consider appropriate. In the event that both you and the commission agree as to the necessity of placing an order pursuant to section 9 for the product or material desired, you are hereby authorized so to do. If however, you and the commission do not agree, you will, of course, refer the matter to me.

"In the event of a refusal by such person to comply in whole or in part with any order so placed, you should transmit the case to me with specific recommendations from you and the commission for further action pursuant to section 9."

President Roosevelt last week signed the bill making law the authorization of loans to South America which has recently been passed by both houses of congress.

The measure increases the lending power of the Export-Import bank by

\$500,000,000, primarily for Latin American loans, and it permits the RFC to borrow an additional \$1,000,000,000 to help finance various aspects of the defense program.

As originally passed by the senate, the bill dealt only with the increased authorization for the Export-Import bank. But the conference report, approved by vote of 33 to 21, accepted the house recommendation for the larger sum, which had been requested by Federal Loan Administrator Jesse Jones.

In a letter made public by Senator Wagner of New York, sponsor of the bill, Mr. Jones revealed that the RFC has already made commitments totaling \$558,609,290 for loans and investments for national defense since June, when it was authorized to do so.

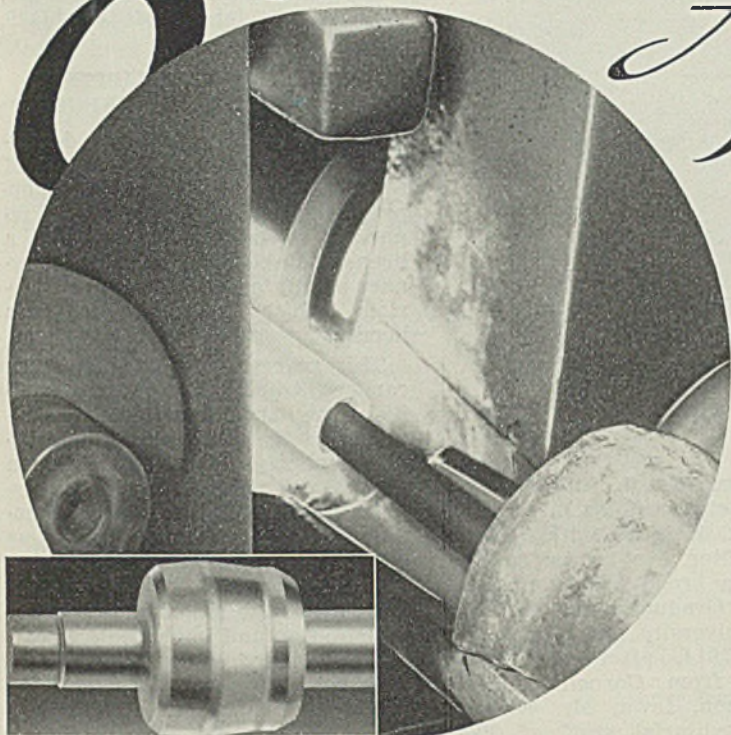
The defense commission, Mr. Jones added, "has advised that other commitments in substantial amounts will be necessary."

The RFC, Mr. Jones said, has already made commitments of \$145,000,000 to build up a raw rubber reserve through the government's Rubber Reserve Corp.; \$105,000,000 for a reserve of tin, antimony, manganese and other strategic minerals through the Metals Reserve Corp.; \$53,000,000 for a reserve of high-test aviation gasoline through the Defense Supplies Corp.; and \$5,000,000 for construction of government plants and purchase of machinery for manufacturers with war or navy department orders, through the Defense Plant Corp. (Private firms have obtained the balance of the RFC commitments).

Senator Wagner declared that the RFC at the present time has the "totally inadequate" authorization of \$500,000,000 for all purposes.

If the authorization of an additional \$1,000,000,000 should not be granted, "you would leave the RFC flat," the New Yorker warned his colleagues. The defense commission finds new needs "each day" for the

8 SECONDS *After Piercing* CRITICAL EYES INSPECT FOR OHIO QUALITY



OHIO Quality depends on the skill and experience of many craftsmen. Modern Machinery and methods are important — but men trained by years of actual experience are the prime essential.

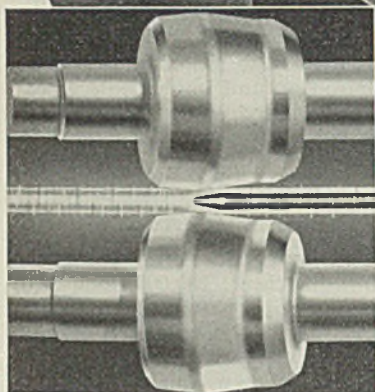
OHIO Quality in the making

Steel Billets of the right analysis and quality for your particular tubing requirements, sawed to length, and brought to piercing temperature under the experienced eyes of men who know their steel, stop momentarily on their way to the piercing mill as an automatic air hammer locates the center of the billet.

Seconds later that billet comes from the piercing mill as a seamless tube. Rapidly revolving rolls, driven by the force of 1200 horse power, have gripped the glowing billet and forced it against the piercing point, spinning from the solid billet a tube with seamless walls of uniform thickness.

Our first critical inspection of the tube is immediately after the piercing operation. Keen eyed Ohio craftsmen inspect the red hot tube both inside and out for any defects that might not be evident when the tube has cooled. Possible mechanical or inherent defects not noticeable in the original billet are then discarded at this point. This inspection is under the control of our Metallurgical Department as a means of double checking their selection of the original steel and in order that all finished tubes will measure up to the high standards of OHIO Quality

The more exacting your requirements, the more you will appreciate this better tubing. Let's talk it over.



Billet piercing is an art which OHIO craftsmen have developed by life long practice.

The first of many inspection operations that guard OHIO Quality. It takes an experienced eye to detect the flaws this man would recognize.



Safety on the ground is no less essential than it is in the air. When big ships come in for a landing, and as they race down the run way for a take-off, OHIO Quality in shock struts and landing gears lives up to a great reputation. Such parts deserve the best in seamless steel tubing.



The **OHIO**
SEAMLESS TUBE CO.
OHIO SPECIAL QUALITY
Shelby, OHIO

RFC's financial power, Senator Wagner added.

Senators Taft of Ohio and Adams of Colorado attacked the proposal on the grounds that the extra \$1,000,000,000 could be used by the RFC "for any purpose," not necessarily for the national defense. The authorization constitutes "an evasion" of the Constitution, Senator Adams contended.

The \$500,000,000 additional lending power to the Export-Import bank is intended in part to fight Nazi economic and political penetration of Latin-America, the senate was told.

The loans would be used for development of resources needed for American national defense; for promotion of American trade with Latin-America; for aiding Latin-American nations to avoid "distress selling" of agricultural commodities at ruinous prices.

SEEK AMENDED RULES ON WAGE-HOUR RECORD KEEPING

Acting on the request of spokesmen for large industrial concerns for further revision of the record-keeping regulations issued under the fair labor standards act, the wage and hour division has announced a hearing Oct. 17.

Dr. Gustav Peck, assistant director of the hearings branch, will preside at the hearing, called, in the language of the official notice, to determine "what, if any, amendments should be made to regulations, part 516, in respect to the records to be kept by employers of persons employed, wages, hours, and other conditions and practices of employment."

Representatives of large employers who already have complete records regarding the hours of work and pay of their employes, kept for other purposes, have complained to the wage and hour division that the present language of the record-keeping regulations issued under the wage and hour law, compels the keeping of certain additional records which are burdensome.

They have suggested that the requirements in the present regulations could be simplified without sacrifice to the protection such records give to the employes involved.

PRESIDENT ISSUES RULING ON STEEL SCRAP EXPORTS

Last week President Roosevelt issued regulations dealing with the licensing of all kinds of iron and steel scrap following his announcement of the week before that no export licenses for scrap would be granted to other than Great Britain and countries in the Western Hemisphere.

In the regulations, the President sets forth that the construction and

Joins STEEL'S Staff



Harold A. Knight

■ STEEL takes pleasure in announcing the appointment, as of Oct. 1, of Harold A. Knight as its newest associate editor. He brings to his new duties a broad background of experience. Graduating from the Columbia university school of journalism in 1914, after previously graduating from Cornell college, Mount Vernon, Iowa, Mr. Knight joined the editorial staff of *The Iron Age*. He left that post in 1917 to become iron, steel and metals editor of *The New York Journal of Commerce*, severing this connection Sept. 30 to become associated with STEEL. Mr. Knight also has contributed to various publications including *The Annalist* and *Purchasing*. For the latter he prepared a series of articles entitled "Reading the Business Barometers." He is the author of a book on the steel industry. His office will be in STEEL's headquarters at Cleveland.

definition of the term "iron and steel scrap" is to read as follows:

"Iron and steel scrap—All iron and steel scrap of every kind and description, classified or unclassified."

The regulations as announced by the White House which were issued on July 2 for many commodities are applicable to the exportation of iron and steel scrap. The new regulations will become effective Oct. 16. This is being construed in Washington as meaning 12:01 a.m., Oct. 16, the new scrap export licensing system becomes effective.

RFC LOANS HAVE TOTALED \$2,631,493,872 SINCE 1938

Since the RFC resumed lending during February, 1938, it has authorized 8188 loans aggregating \$2,631,493,872.76. Six thousand, eight

hundred and thirty-three of these loans aggregating \$412,400,092.27 were to business (exclusive of national defense loans) including \$23,787,642.87 later taken up by banks. Banks participated in these business loans to the extent of \$75,246,953.79, making a total of \$463,859,403.19.

SHIPMENTS TO PHILIPPINES TO BE CONSIDERED EXPORTS

Division of controls, state department, has ruled that "shipment of articles and materials to the Philippine Islands will henceforth be regarded as an exportation, and a license will be required before clearance of any of the articles or materials which now require such license."

This reverses the position taken earlier with regard to the applicability of the export control act to shipments to the Philippines. State department says that this instruction "should not be considered as applying to the shipments of arms, ammunition and implements of war, as defined in the President's proclamation of May 1, 1937. No license is required for the shipments of arms, ammunition and implements of war, as so defined, to the Philippine Islands."

BRAZILIAN IRON OUTPUT TO TOTAL 200,000 TONS

Brazilian production of pig iron in 1940 will total 200,000 long tons valued at approximately \$3,500,000, according to the ministry of agriculture. The estimate is based on increases shown during the first seven months of 1940 as compared with the same period of 1939. During the period January-July, 1940, pig iron production totalled 104,278 tons valued at 38,811 contos, as compared with 91,448 tons valued at 34,077 contos, in 1939.

Stillwater Complex Chromite Deposits Traced

■ Geological survey, department of the interior, Washington, has prepared a report on the chromite deposits of the eastern Stillwater Complex, Stillwater county, Montana.

Report is based on a study made by the geological survey in 1939 on Little Rocky creek. Later trenching by bureau of mines traced segments of a tubular body of chrome ore with an aggregate length of 5660 feet for a distance of 9000 feet. Average width of the ore body is only 5½ feet, but at the east end a zone of disseminated ore 430 feet long averages 29½ feet in width. Ore will need concentration, as average content of chromite is about 50 per cent.

Nearly 65 Per Cent of August Iron, Steel Exports to Britain

■ STEEL and iron exports, excluding scrap, increasing for the fourth consecutive month, passed the million-ton mark and set an all-time record when August shipments totaled 1,046,084 gross tons, valued at \$53,870,693, according to the metals and minerals division, department of commerce.

Exports in July, 1940, which had set a record, totaled 707,809 tons, valued at \$39,511,996. In August,

27,473 tons to Canada and 22,484 tons to Japan. Pig iron was the second largest product exported, the United Kingdom taking 119,139 of the 121,948-ton total.

Nonalloy plates exported totaled 75,304 tons, 41,602 tons to the United Kingdom, 12,451 tons to Canada and 7614 to the Union of South Africa. Plain structural shapes were exported to a total of 74,330 tons, including 47,630 tons to the United Kingdom, 9768 tons to Canada, 4846 to Japan and 1834 to Venezuela.

Scrap exports in August amounted to 355,991 tons, compared with 327,129 tons in July and 291,896 tons in August, 1939. Cumulative scrap exports for eight months this year were 2,164,225 tons, compared with 2,430,914 tons in the comparable period in 1939.

U. S. FOREIGN TRADE IN IRON AND STEEL, INCLUDING SCRAP

	Gross Tons			
	1940		1939	
	Exports	Imports	Exports	Imports
Jan.	583,521	8,274	362,672	27,664
Feb.	671,301	6,740	359,690	19,149
Mar.	663,980	5,096	474,360	25,369
April	612,906	6,674	394,008	44,083
May	783,964	7,759	532,641	28,142
June	936,047	5,505	588,856	32,587
July	1,034,938	3,542	513,664	30,851
Aug.	1,402,075	2,105	477,078	28,328
Sept.			575,613	29,874
Oct.			591,856	19,189
Nov.			605,555	15,216
Dec.			600,437	14,709
Total			6,076,429	315,161

1939, exports were only 185,182 tons, valued at \$13,282,599.

Cumulative export trade for eight months this year reached 4,524,507 tons, valued at \$291,352,901, more than three and one-half times as much in quantity and over three times as great in value as the comparable 1939 figure, 1,272,055 tons, valued at \$95,678,644.

Distribution of August shipments among principal markets in July and August this year and the first eight months of this and last year are found in the accompanying table.

Nonalloy ingots, blooms and similar products formed the largest item of exports in August, 342,641 tons being shipped, including 287,318 tons to the United Kingdom,

DISTRIBUTION OF UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Principal countries of destination	(In Gross Tons)				
	August 1940	July 1940	August 1939	January thru August 1940	January thru August 1939
United Kingdom	653,866	376,066	11,783	1,655,042	52,750
Canada	108,017	69,969	34,701	501,674	166,241
Japan	66,829	17,025	4,235	192,537	89,941
Argentina	37,156	37,851	1,512	300,766	13,834
Un. S. Africa	22,859	20,092	3,371	107,083	30,136
Brazil	14,443	21,207	10,379	192,601	90,837
Philippine Is.	13,175	8,365	12,210	96,582	82,668
Total exports, all countries	1,046,084	707,809	185,181	4,524,507	1,272,054

ARTICLES	Jan. through Aug.		
	Aug. 1940	July 1940	Aug. 1940
Not cont. alloy	16,857	12,437	92,762
Stainless steel	54	2	99
Alloy, not st'ness	532	21	850
Tin plate, laggers' tin	19,895	30,078	314,522
Terne plate (including long ternes)	715	369	4,212
Tanks, except lined	3,523	2,082	19,799
Shapes, not fab.	74,330	24,527	205,552
Shapes, fabricated	4,842	4,359	47,922
Plates, fabricated	3,682	642	13,186
Metal lath	114	75	940
Frames and sashes	193	150	1,252
Sheet piling	425	1,673	8,968
Rails, 60 lbs.	70,081	12,367	122,696
Rails, under 60 lbs.	4,090	921	16,937
Rails, relaying	5,064	3,249	14,391
Rail fastenings	1,215	900	6,967
Switches, frogs, crossings	92	115	2,186
Railroad spikes	177	494	3,234
Railroad bolts, nuts	197	124	1,576
Boiler tubes, seamless	1,797	1,973	14,101
Boiler tubes, welded	216	162	1,521
Pipe: Seamless casing and oil-line	8,422	8,615	81,394
Do., welded	980	916	21,599
Seamless black	1,591	4,402	21,971
Pipe fittings: Mall. iron screwed	277	737	3,453
Cast-iron screwed	115	200	1,835
Pipe and fittings for: Cast-iron pressure	3,550	6,246	37,043
Cast-iron soil	1,938	4,872	14,176
Pipe welded: Black steel	2,727	4,220	26,771
Black w'ght-iron	582	2,186	5,722
Galvanized steel	4,126	4,361	35,202
Galv. w'ght-iron	772	750	5,689
All other pipe, fittings	1,289	1,866	10,799
Wire: Plain iron or steel	7,476	8,204	59,347
Galvanized	6,218	5,253	38,888
Barbed	6,020	3,580	25,169
Woven-wire fencing	368	279	2,946
Woven-wire sc'n cloth: Insect	85	77	486
Other	193	150	1,488
Wire rope and cable	1,331	1,012	7,370
Wire strand	104	280	987
Electric welding rods	383	363	2,477
Card clothing	1	1	10
Other wire	785	1,486	11,020
Wire nails	4,457	5,524	37,923
Horseshoe nails	122	173	779
Tacks	70	112	563
Other nails, staples	444	687	3,650
Ordinary bolts, machine screws	5,033	2,192	15,141
Castings: Gray-iron (incl. semisteel)	378	289	2,972
Malleable-iron	245	308	1,585
Steel, not alloy	237	84	1,306
Alloy, inc. st'ness	132	105	1,000
Car wheels, tires, axles: Wheels and tires	1,940	663	9,196
Axles, no wheels	126	36	1,370
Axles with wheels	50	17	879
H's shoes and calks	47	9	263
Forgings, n.e.s.:			
Not cont. alloy	3,959	2,191	17,823
Alloy, inc. st'ness	180	137	2,757
Total	1,046,084	707,809	4,524,507
Scrap, iron, steel	346,087	326,546	2,142,176
Scrap, tin plate		150	2,841
Tin plate circles, strips, cobbles, etc.	396	101	3,087
Waste-waste tin plate	220	226	5,352
*Terne plate clippings and scrap	9,288	106	10,769
Total scrap	355,991	327,129	2,164,225
GRAND TOTAL	1,402,075	1,034,938	6,688,732
Iron ore	220,964	258,201	847,602

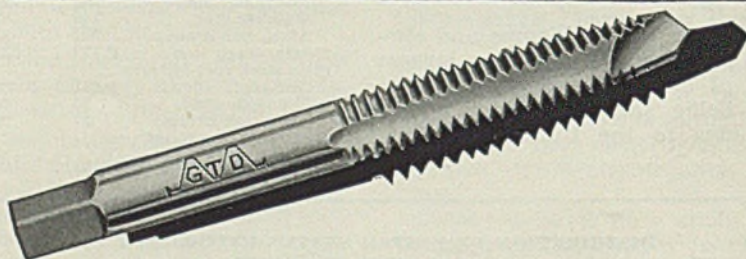
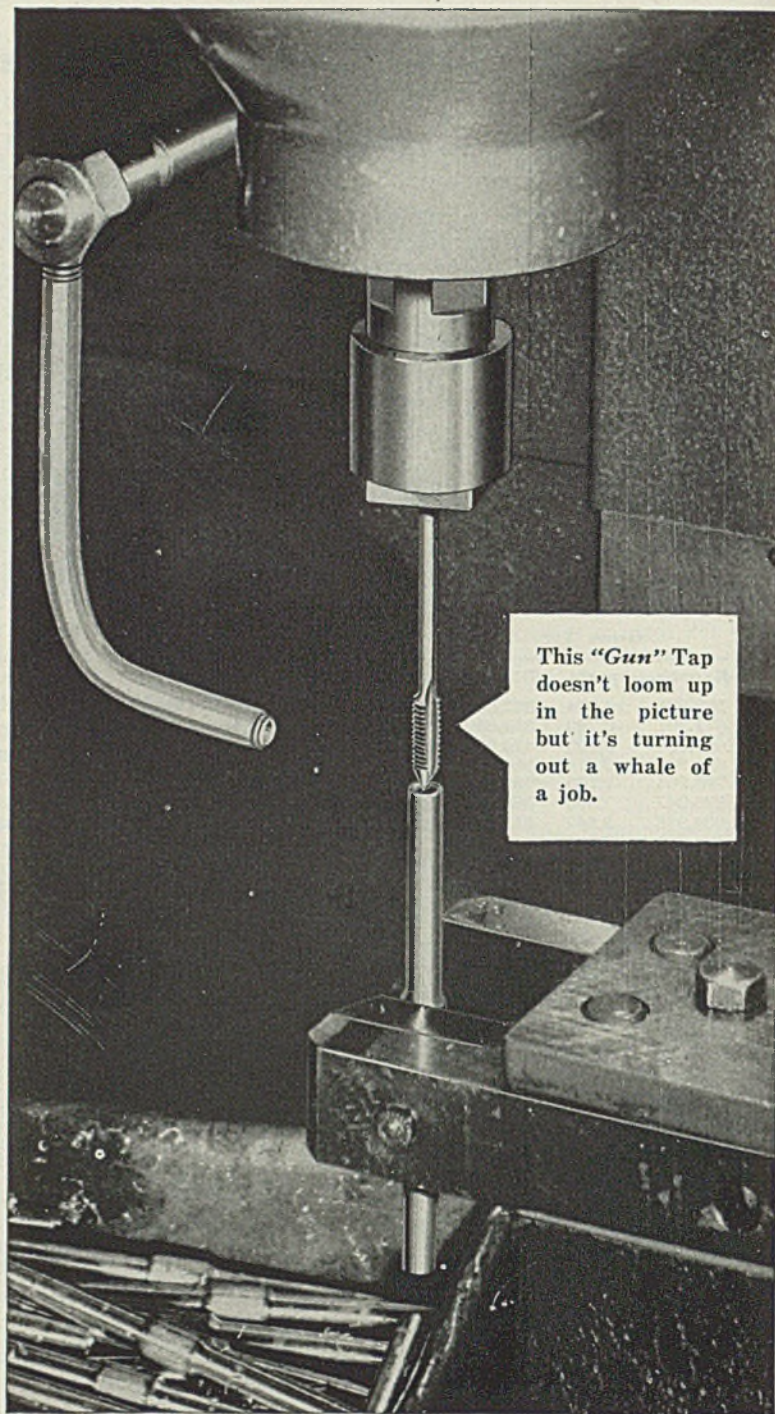
*New class.

■ Delco-Remy division, General Motors Corp., Anderson, Ind., has started construction of a magnesium-aluminum foundry to supply the corporation's Allison Engineering division, Indianapolis, with castings for the V-12 airplane engines which the latter will manufacture in two additions now under construction.

MORE PRODUCTION with "GUN" TAPS

When an eastern aircraft manufacturer needed to thread these brass sleeves, "Gun" Taps were chosen. Why? Because tests proved that "Gun" Taps had the combined accuracy and stamina to meet the stringent requirements of the job. Cutting a 10-32 thread through this long sleeve requires quite a tap. Special long shank ground thread "Gun" Taps were the answer. They thread through at the rate of 550 R.P.M. and turn out two finished jobs every minute. The average production is 6,000 parts per tap—with 1,000 between grinds.

Has your plant a tough job—in brass, bronze, iron, steel, plastic or fiber? "Greenfield" engineers can help you lick it. Ask for suggestions.



GREENFIELD TAP & DIE CORPORATION., Greenfield, Mass.

Detroit Plant: 2102 West Fort St. Warehouses in New York, Chicago, Los Angeles and San Francisco. In Canada: Greenfield Tap & Die Corp. of Canada, Ltd., Galt, Ont.



TAPS · DIES · GAGES · TWIST DRILLS · REAMERS · SCREW PLATES · PIPE TOOLS

STEEL

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Workers' Slowdowns Thwart Engineering Progress.

New Ford Frames Are Stronger, but Not Heavier.

General Motors To Manufacture Shells at Lansing.

Days of Automobile Tool Kit Appear To Be Limited.

Magnesium Foundry To Be Installed at Rouge Plant.

DETROIT

■ AXIOMATIC in automobile manufacturing is the constant search for new machinery, new equipment, new tools, new methods to facilitate a better product at less cost. Engineers and designers are untiring in their efforts to perfect machinery to relieve operators, to make their work less tiring, to reduce the number of manual operations required and to speed production. Their efforts are translated into better automobiles which can be sold at a lower price, thereby expanding the market, increasing production, making more jobs and, of course, broadening profits.

This cycle has been repeated endlessly over the past 30 years and more than anything else explains the success which has attended auto manufacturing. Right now, however, there are some hitches developing in the system. The engineers are still on the job and continue to demonstrate their ingenuity in simplifying production techniques; but in many cases when new machines are introduced in the plants, they cannot be operated at their maximum or even at their designed efficiency.

Labor, organized into a powerful and at times ruthless union, virtually dictates at what speeds men shall work. If a new machine is designed to produce 200 pieces an hour at normal operator effort, comparing with output of, say, 100 pieces per hour from an older type of machine, the new rate will not be achieved unless union shop stewards and committees decide to permit such a rate. They may say, "No, even though the new machine will do 200 pieces per hour,

this is too fast. We will instruct the operator to work at a speed of 125 pieces per hour, and if he knows what is good for him he will not go beyond this rate."

Multiply such hypothetical cases by hundreds and you can see why serious disturbances are being felt in the basic philosophy of "build more for less money." It is futile to perfect new production techniques if the savings possible are not realized. Under present circumstances they are not being realized and there is nothing than can be done about it.

Partly Management's Fault

Labor's determination to set its own production rate springs from a practice which originated in the motor industry years ago, and for which management must take its share of the blame. At that time nearly all production was on a piecework basis and the pressure was continually being applied to workmen to step up their production rate, holding out the enticement of fatter pay envelopes. The only trouble was that as soon as the higher production rate was accomplished and the men began to earn high wages, managements would decide to lower the piece rate. Thereupon wages dropped but the pressure remained on production.

There was no scientific determination of piece rates which were constantly being adjusted, usually downward, and as a result, after the establishment of the UAW in the

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industry in 1937, piece rates generally were tossed out the window in favor of flat hourly rates. Production speeds then became based, to a certain extent, on the willingness of men to work. The efficient workmen were leveled to the plane of the least capable and any pressure from management for speeding up production resulted in the "slowdown strikes."

Today, while disturbances are fewer, the labor situation is touchy and labor relations must be handled with kid gloves. Whether a return to piece rates ever will come about seems doubtful, although there are a few straws in the wind which indicate that workmen, regardless of union affiliation, are coming to recognize the advantages of equitably determined piece rates.

The experience of one parts company here is a case in point. This is a small plant, but all workmen are UAW members and the company has a contract with the union. Recently some outside engineers were called into the plant to study operations. After detailed analysis it was recommended that an incentive plan be set up, with piece rates to be determined by the investigators and rigidly adhered to by the management. Despite the known fact that organized labor is strongly opposed to incentive plans, the men were assembled and details of the plan laid before them. Convinced that rates had been scientifically determined and assured that there would be no deviation from them, the men hesitantly agreed to the plan. It has now been in operation for several weeks and is working beautifully. The men are making higher wages and at the same time production costs have been reduced.

■ INCREASED strength and resistance to twisting, without any increase in weight, has been achieved by a new structural design for Ford frames. Most significant feature is the all-welded box-type center section of the X-member, a departure in frame construction. Of true "X"

design, with fore and aft diagonals in line, the X-member is braced to the side members at eight points. Full box sections are formed where the X-member channels join the side members, and the rear cross member also is of box-type construction. Approximately 9 inches deep, the center section is butt-welded to the X-member channels. The rear cross member, to which the rear spring is attached, is an inverted channel with flanged legs with a plate welded to the flanges to make it a box section. The rear spring is U-bolted against the bottom plate.

Ford has announced officially the new 4-cylinder truck engine mentioned here some weeks ago. Developing 30 horsepower at 2800 r.p.m. the engine has total displacement of 119.5 cubic inches, cylinder bore being 3.187 inches and stroke 3.75 inches. Crankshaft is cast alloy steel and camshaft cast alloy iron. Valves are chrome-nickel steel with tungsten steel valve seat inserts in both intake and exhaust valves. Camshaft gears are bolted on. Valve stems are hardened where they fit into guides.

Pipe piling for the aircraft engine plant now under way at the River Rouge plant is being driven to bed rock, about 50 miles of pipe being required for the job. Contract for the pipe, amounting to 4000 tons, has been awarded to American Rolling Mill Co., according to trade circles here.

Receipts of a \$9,505,600 shell order from the war department by General Motors has meant a reshuffling of plans for the heavy press plant the

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce			
	1938	1939	1940
Jan.....	226,952	356,692	449,492
Feb.....	202,597	317,520	422,225
March....	238,447	389,495	440,232
April....	237,929	354,266	452,433
May.....	210,174	313,248	412,492
June.....	189,402	324,253	362,566
July.....	150,450	218,494	246,171
Aug.....	96,946	103,343	89,866
8 mos....	1,552,897	2,377,691	2,875,477
Sept.....	89,623	192,678	.....
Oct.....	215,286	324,688	.....
Nov.....	390,405	368,541	.....
Dec.....	406,960	469,120	.....
Year....	2,655,171	3,732,608	.....

Estimated by Ward's Reports		
Week ended:	1940	1939†
Sept. 7	39,665	26,865
Sept. 14	66,615	*42,445
Sept. 21	78,820	*55,350
Sept. 28	95,990	*64,365
Oct. 5.....	105,153	76,095

†Comparable week. *Revised.

Oldsmobile division is now equipping at Lansing, where the shells will be made. Floor layouts have been revised to accommodate the 150,000 square feet necessary for shell equipment as well as equipment already on order for production of automobile forgings. S. E. Skinner, general manager of Olds, will have charge of the shell division. Production is still many months away, with first equipment still to be erected.

In view of the fact it will be neces-

sary to concentrate on the shell order, some Olds forgings which were going to be brought into the Lansing plant from Buick and outside forging suppliers must stay with the latter companies for the time being. Upsetters will be the central equipment required for the shell forgings and, despite the nearness of government priorities on forging equipment required for the defense program, these machines probably will not start moving into the Olds plant until March.

A number of innovations feature the Cadillac line for 1941. Hood lines have been completely revised, eliminating side panels in favor of a single hood stamping, broad and low. Fenders are longer, bullet-shaped and carry the headlamps as well as recesses for a newly developed fog lamp in each side. Grille is massive, of checkerboard pattern and has in-built turn indicators on either side.

Fewer Tools with New Models

Another novel touch is the location of the gas tank filler pipe underneath the tail lamp assembly, the latter being hinged so that it can be lifted up to disclose the pipe cap.

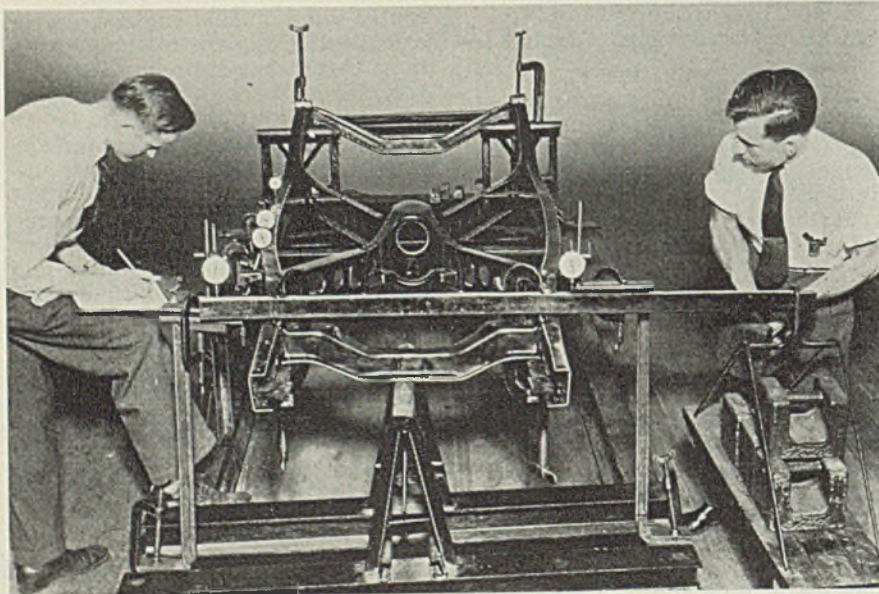
The days of the automobile tool kit seem to be numbered, as each year efforts are made to make a tool kit less expensive, and of course less necessary. Comprising a pair of pliers, a screw driver and possibly a couple of wrenches, these kits vary somewhat in cost to car manufacturers, but the one supplied with a popular low-priced car is figured at 43 cents. On the larger and more expensive cars, these kits may be even less costly, the theory being that the buyer of an expensive limousine probably will never use the kit.

Efforts have been made to sell the motor companies special screw drivers to handle the new types of recessed-head screws used in garnish moldings and elsewhere, which cannot be manipulated with the conventional screw driver. However, the car companies have balked at adding such a tool, even though the cost might not be over 10 cents.

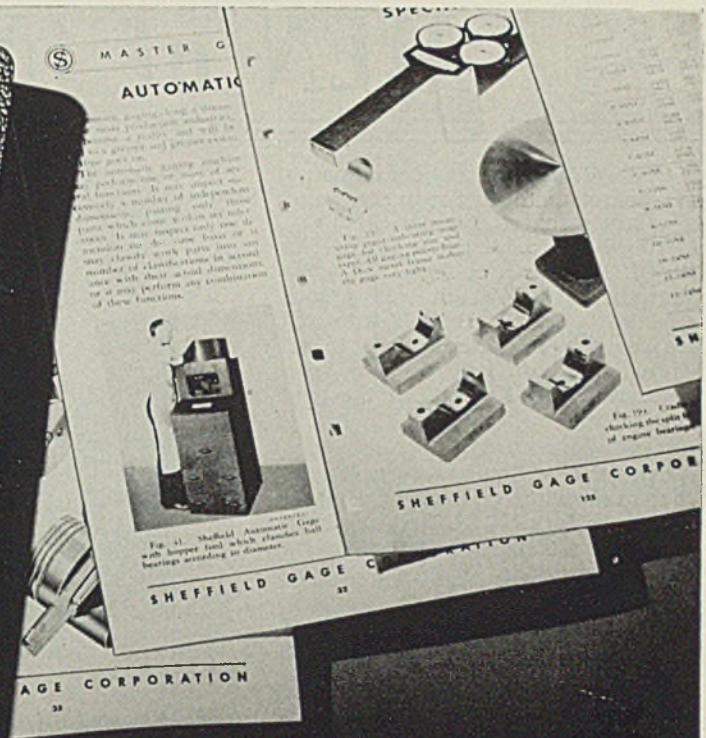
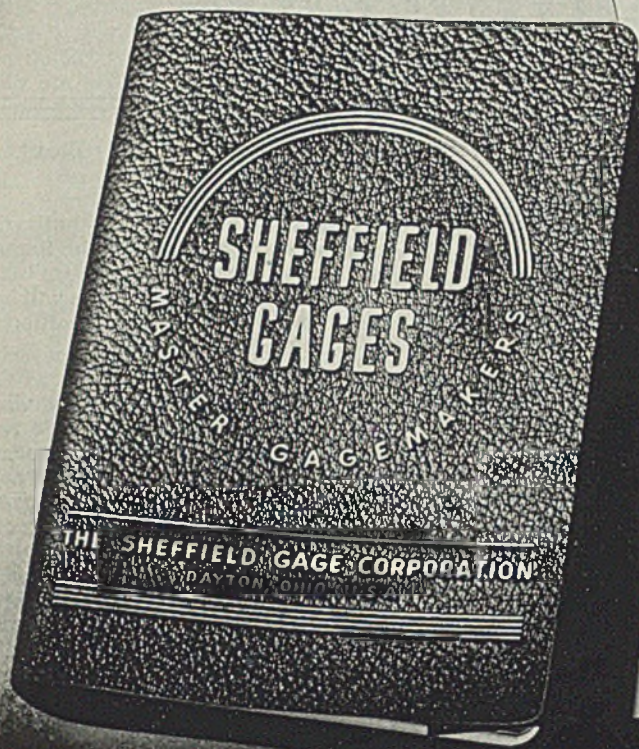
The stock answer to any proposal for some additional item for a car is about as follows: "Let's see, your suggestion would call for increase of 16 cents per car, with annual production of 300,000; that's \$48,000—and just for a whatzis! Impossible!"

Magnesium alloy casting requirements for airplane engines to be produced at Ford may be supplied by a new magnesium foundry to be installed in the electric furnace building. Further, it is reported, Ford engineers are making experiments on electric furnace reduction methods for separating the metal from magnesium ores, as a means of insuring a supply of metal should it prove to be impossible to obtain sufficient quantity from Dow Chemical Co.

Putting Pressure on New Ford Frame



■ Strength and resistance to twisting has been increased 100 per cent in the new Ford frame without increasing weight. In this laboratory test, heavy weights applied to a corner of the frame check its greater rigidity. The new Ford frame, an innovation in the automobile industry, has a redesigned center X-member section, and it is stated that it will mean exceptionally quiet operation in the 1941 models



Last word ON

PRECISION GAGES AND GAGING

"SHEFFIELD GAGES" just off the press is a comprehensive presentation of precision gages—design, construction and application together with standards and constants useful in practical inspection work.

Manufacturers engaged in the manufacture of engines, machine tools, automotive or military equipment, or any enterprise where inter-changeability of parts is essential, will find this book very useful.

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THE SHEFFIELD GAGE CORPORATION
 1528 EAST THIRD STREET
 DAYTON, OHIO, U. S. A.

MEN of INDUSTRY

■ T. T. WATSON has been appointed research metallurgist in charge of all plant research, Lukens Steel Co., Coatesville, Pa. A graduate of the Royal Technical college, Glasgow, Scotland, Mr. Watson was associated with several British iron and steel companies before coming to the United States in 1930. He has been associated with Lukens for the past nine years.

Samuel G. Allen has been elected chairman of the board, Superheater Co., New York. H. F. Ball has been named a member of the executive committee.

Charles B. Little has been elected vice president, Bogue Electric Co., Paterson, N. J. Company has just completed a plant expansion program.

Neil H. Brown, Charlotte, N. C., has been appointed district representative for the Northern Equipment Co., Erie, Pa., and will handle the company's line of Copes feed water regulators, differential valves, pump governors and allied equipment.

John L. Auch has been appointed treasurer, Pittsburgh Coal Co., Pittsburgh, succeeding William McPher-son, who retires.

C. A. Peck has joined the tool steel department of the Chicago office, Allegheny Ludlum Steel Corp., Pittsburgh.

Irving H. Jones has been appointed manager of railroad sales, Allegheny Ludlum Steel Corp., Pittsburgh.

Ralph W. Atkinson, 215 West Seventh street, Los Angeles, has been appointed West coast representative for the Tomkins-Johnson Co., Jackson, Mich. Weldon Engineering Co., 1791 Howard street, Chicago, has been appointed representative in the Chicago territory.

John L. Schmeller has been named vice president in charge of sales, National Bronze & Aluminum Foundry Co., Cleveland.

P. O. Weston, formerly manager of the St. Louis sales office of Rockbestos Products Corp., New Haven, Conn., has been transferred to the Pacific coast territory. J. T. Williams has been transferred from the Chicago office to the managership of the St. Louis area. Carle Vande Bo-



T. T. Watson

gart, formerly of the Detroit office, replaces Mr. Williams at Chicago. J. O. Pease, formerly in the New England territory has been shifted to Detroit, and R. G. Newton, of the New Haven sales office has been assigned to the New England territory.

Roy A. McElhinney, formerly superintendent, Mid-West Abrasive Co., Detroit, has been named production manager for all the company's manufacturing units.

Gilbert L. Wolfe has been appointed by American Nickeloid Co., Peru, Ill., as representative of company's Schenectady, N. Y. office and will cover central New York.

Arnold L. Nacke has been appointed New York sales agent for Modern Tool Works, Rochester, N. Y. Mr.



T. B. Daniels

Who has been appointed manager of Jones & Laughlin Steel Corp.'s Chicago warehouse, as noted in STEEL, Sept. 23, p. 85

Nacke's office is at 92 Bleecker street, New York.

William G. Walker, assistant general purchasing agent for the Santa Fe railroad, Chicago, will retire Oct. 31, after 37 years' service. He will be succeeded by William S. Riach, Topeka, Kans.

John W. Darr, formerly vice president and director of public relations, Commercial Investment Trust Inc., New York, has been appointed vice president and managing director of the Institute of Public Relations, New York.

E. George Hartmann has been appointed assistant manager of sales, round, flat wire, and specialties division of John A. Roebling's Sons Co., Trenton, N. J. Mr. Hartmann formerly was with the Wickwire Spencer Steel Co.

Edward Walters, formerly of the Chicago office, Harnischfeger Corp., Milwaukee, has been appointed assistant sales manager of the welder and electrode division.

L. H. Miller has been appointed head of the liquid plastics division, Ferro Enamel Corp., Cleveland. He formerly was associated with Pittsburgh Plate Glass Co. at Milwaukee.

Ralph L. Dickey has been elected president, Kelley Island Lime & Transport Co., Cleveland, succeeding George J. Whelan. Mr. Whelan, who has been with the company more than 35 years, becomes chairman and will continue to give considerable attention to the company's affairs. Mr. Dickey has been associated with the United States Gypsum Co. at Chicago, for the past several years.

Otto V. Gray, assistant to general superintendent, Gary, Ind., sheet and tin mills, Carnegie-Illinois Steel Corp., retired Oct. 1 after 39 years of continuous service with United States Steel Corp. subsidiaries.

Richard Wayland-Smith has retired as assistant manager of sales at the New York office of Carnegie-Illinois Steel Corp. after 44 years' service with United States Steel Corp. subsidiaries.

C. C. Hermann has been appointed chief engineer for the Claude B. Schneible Co., Chicago, designers

and manufacturers of dust collection equipment, dewatering equipment, sludge pumps and vent hoods. He has been in charge of the company's Philadelphia office since 1937.

Howard A. Acheson, president, has acquired sole control of Acheson Colloids Corp. from Acheson Corp., New York. Other officers of the company: Margaret M. Acheson, chairman; George R. Siegrist, vice president, treasurer and director; John P. Deringer, vice president and director; John C. Sprague, secretary; Lester H. Miller, assistant secretary and assistant treasurer.

William W. Calihan, former district manager at Rochester, N. Y., for H. K. Porter Co. Inc., has been transferred to Pittsburgh to handle sales of the process equipment division.

W. C. Weslow has been appointed manager, mining division, Carboly Co. Inc., Detroit. He has been with the company since 1931.

William W. Finlay, associated with the Wright Aeronautical Corp., Paterson, N. J., 13 years, and since 1937 manager of its license division, has been appointed manager of the company's aircraft engine factory to be erected in Lockland, O.

MEETINGS

ARMY OFFICIAL TO SPEAK ON NATIONAL DEFENSE

■ COL. J. F. JENKS, ordnance department, U. S. Army, and national president, American Welding society, will speak on "Welding in National Defense" before the Cleveland section of the society at the Mid-day club, Union Commerce building, Cleveland, Oct. 9.

SCHEDULE 40 PAPERS FOR CINCINNATI MEETING

Forty papers are scheduled for presentation at the middle eastern district meeting of the American Institute of Electrical Engineers, Hotel Netherland Plaza, Cincinnati, Oct. 9-11. E. S. Fields is chairman of the Cincinnati committee.

Convention Calendar

Oct. 6-11—Chicago Exposition of Power and Mechanical Engineering, International amphitheatre, Chicago. International Exposition Co., Grand Central Palace, New York, is manager.

Oct. 7-8—Boston Conference on Distribution. Twelfth conference, Hotel Statler, Boston. Daniel Bloomfield, 80 Federal street, Boston, is manager.

Oct. 7-10—American Gas association. Twenty-second annual convention, At-

lantic City, N. J. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 7-11—National Safety council. Twenty-ninth national safety congress and exposition at Stevens hotel, Chicago. W. H. Cameron, 20 N. Wacker Drive, Chicago, is managing director.

Oct. 8 — Army Ordnance association. Twenty-first annual meeting at the Waldorf-Astoria hotel, New York.

Oct. 9-11—American Institute of Electrical Engineers. Middle eastern district meeting, Hotel Netherland Plaza, Cincinnati. H. H. Henline, 33 West Thirty-ninth street, New York, is secretary.

Oct. 14—Society of Automotive Engineers. Annual dinner, Hotel Commodore, N. Y. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary.

Oct. 14-16 — American Gear Manufacturers association, twenty-third semi-annual meeting, Skytop Lodge, Skytop, Pa. J. C. McQuiston, 602 Shields building, Wilkinsburg, Pa., is secretary.

Oct. 15-18—American Institute of Steel Construction. Eighteenth annual convention, Greenbrier hotel, White Sulphur Springs, W. Va. V. Gilmore Iden, 101 Park avenue, New York, is secretary.

Oct. 16-18—Porcelain Enamel institute. Fifth annual forum, University of Illinois, Urbana, Ill. Charles C. Pearce, 612 N. Michigan avenue, Chicago, is managing director.

Oct. 17-20—American Society of Tool Engineers. Semiannual meeting, Cincinnati. Ford R. Lamb, Boulevard Temple building, 2567 W. Grand boulevard, Detroit, is secretary.

Oct. 21-22—Associated Machine Tool Dealers of America. Annual convention, Dayton Biltmore hotel, Dayton, O. Thomas A. Fernley Jr., 505 Arch street, Philadelphia, is secretary.

Oct. 21-25—American Institute of Mining and Metallurgical Engineers. Fall meetings, Iron and Steel and Institute of Metals divisions, Hotel Statler, Cleveland. A. B. Parsons, 29 West Thirty-ninth street, New York, is secretary.

Oct. 21-25—American Society for Metals. Twenty-second national metal congress and exposition, Public auditorium and Hotel Statler, Cleveland. W. H. Eisenman, 7301 Euclid avenue, Cleveland, is secretary.

Oct. 21-25—American Welding society. Twenty-first annual meeting, Cleveland hotel, Cleveland. Miss M. M. Kelly, 33 W. 39th street, New York, is secretary.

Oct. 21-25—Wire association. Annual meeting, Carter hotel, Cleveland. Richard E. Brown, Stamford Trust Co. building, 300 Main street, Stamford, Conn., is secretary.

Oct. 25-26—Foundry Equipment Manufacturers association. Annual meeting, The Homestead, Hot Springs, Va. Arthur J. Tuscany, 632 Penton building, Cleveland, is secretary.

Oct. 31-Nov. 2—Society of Automotive Engineers. National aircraft production meeting and engineering display, Biltmore hotel, Los Angeles. John A. C. Warner, 29 W. 39th street, New York, is secretary.

■ Residents of Weirton, W. Va., said to be the largest unincorporated community in the country, voted against a proposal to merge with three adjoining towns to form an incorporated "Greater Weirton." Vote was 1276 to 637.

Died:

■ SIR ROBERT HADFIELD, internationally known engineer and metallurgist, in London, Eng., Sept. 30. He was the inventor of silicon steel, manganese steel, and many other alloys and metallurgical improvement, for which he was honored by many foreign governments and scientific societies. He was chairman of Hadfields Ltd., Sheffield, Eng., and had written a number of articles for *Iron Trade Review* (STEEL).

M. Keith Dunham, chairman and one of the founders of the National Cylinder Gas Co., Chicago, at his home in Michigan, Sept. 29.

Benedict Shubart, 64, of Denver, western sales representative, Link-Belt Co., Chicago, at his home in La Jolla, Calif., Oct. 1.

Morrison Mills, 37, eastern sales representative for Chain Belt Co., Milwaukee, at Philadelphia.

Gottlieb Kroner, 73, president, La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis., in Milwaukee.

Charles V. Seastone, 68, a civil engineer, at his home in Madison, Wis., recently. He had served on the faculties of Purdue and Illinois universities, as chief engineer for D. W. Mead Co., Madison, and later as associate consultant with Mead, Ward & Hunt in electric developments and power plants.

William H. Morgan, 67, member of the engineering firm of Sheppard, Morgan & Schwab, Alton, Ill., in that city, Sept. 26.

Edward F. Smith, 52, Chicago manager of Haynes Stellite Co., unit of Union Carbide & Carbon Corp., in Chicago, Sept. 26.

Lewis Nixon, 79, president, Nixon Nitration Works, Nixon, N. J., at Long Branch, N. J., Sept. 23. Mr. Nixon was noted as a shipbuilder for many years and designed the battleships OREGON, INDIANA and MASSACHUSETTS. Later he served as superintending constructor at the former William Cramp Ship & Engine Building Co., Philadelphia.

Ross W. Smith, former export traffic manager, Willys-Overland Co., Toledo, in Cleveland, Sept. 24.

Edward Heitman, 68, consulting engineer, Nash-Kelvinator Corp., Detroit, in Montreal, Quebec, Can., recently.

Arthur C. Watson, 59, chief engineer, Long Island railroad, in New York, recently.

Activities of Steel Users, Makers

■ LIBERTY Planer & Mfg. Co., 1000 Weller avenue, Hamilton, O., has been organized to succeed the Liberty Machine Tool Co. in the manufacture of Liberty planers. Many of the old Liberty personnel are associated with the new company. Harry Dingeldein is president; H. R. Ryan, vice president; L. G. L. Thomas, secretary-treasurer.

H. K. Ferguson Co., Cleveland, has been awarded a contract to construct a new plant for RCA Mfg. Co. Inc. at Indianapolis. Plant, which will be used to manufacture electronic sound equipment, will be 200 x 500 feet, 1 story, V-type monitor, structural steel frame and face brick exterior.

Rohr Aircraft Corp. announces all its business activities now are located at 371 Eighth avenue, San Diego, Calif.

Universal Gear Corp., Indianapolis, announces the appointment of Lloyd B. Edwards and associates as district sales representatives in the Minneapolis area. Offices are at 841 Lumber Exchange building, Minneapolis.

Sterling Pump Corp., Hamilton, O., has acquired the turbine pump division of the Roots-Connersville Blower Corp., Connersville, Ind. Inventory has been transferred to Hamilton.

National Cylinder Gas Co., Chicago, and The Bastian-Blessing Co., Chicago, have entered into an agreement whereby National will use the facilities of Bastian-Blessing to manufacture a complete line of gas welding and cutting equipment under the Rego trade mark.

Lewis Foundry & Machine division, Blaw-Knox Co., Pittsburgh, has received an order from the Australian Aluminum Co. Proprietary Ltd. for aluminum strip and sheet rolling mill machinery. Installation will include six units and accessories.

Industrial Paint Clinic, a consultation service on industrial maintenance paint problems, has been organized by Grover M. Hermann, president, American-Marietta Co., Chicago. Headquarters are at 43 East Ohio street, Chicago.

Weldon Engineering Co. has been established at 1791 West Howard

street, Chicago, to act as direct factory representative in the Chicago area for the following manufacturers: Electro Lift Inc., New York; National Time & Signal Corp., Detroit; Ross Operating Valve Co., Detroit, and Tomkins-Johnson Co., Jackson, Mich.

Coffing Hoist Co., Danville, Ill., which began operations 12 years ago in a small shop 16 x 18 feet, and moved to larger quarters in 1930, is now located in its own new factory and office building, containing 36,000 square feet of floor space.

Wright Aeronautical Co. is building a magnesium foundry for the manufacture of castings for aircraft engines at Fairlawn, N. J., as part of a \$1,000,000 expansion program to round out national defense facilities. Program includes construction of 200 x 500-foot building at Fairlawn, a further addition to the company's assembly plant at Paterson, N. J., and minor revisions in other plants.

United States Testing Co. has installed a salt spray chamber at its main laboratories in Hoboken, N. J., to test the corrosion resisting properties of ferrous and nonferrous metals.

General Electric Co. will supply turbines for propulsion and power generation for three C-3 passenger-cargo vessels being built for the American South African line at Ingalls Shipbuilding Corp., Pascagoula, Miss.

Robins Conveying Belt Co., Passaic, N. J., have been awarded a contract to design and furnish coal handling equipment for the Commonwealth Edison Co.'s plant at Chicago.

Allegheny-Ludlum Steel Corp., Pittsburgh, has let contracts for construction of a new warehouse on Pacific avenue, Los Angeles.

Cyclone Fence Co., Waukegan, Ill., United States Steel Corp. subsidiary, will construct a 2-story addition to its DeKalb, Ill., works to increase capacity for screen cloth manufacture. New building will be 73 x 163-feet. Company also will construct a new building to house present hot galvanizing equipment and the released space will be used for storage.

Peerless Machine Co., Racine, Wis., has expanded manufacturing

space to enable greater production of its line of power saws. New building includes a large demonstration room where customers may see all types of Peerless saws under power. Additional space for engineering research and experimental work also is being provided.

Forms Clearing House For Research Problems

■ A survey to ascertain what new products, processes or materials might be developed by industrial research that would be valuable to industry recently was completed by Research Advisory service, founded by Bert H. White, vice president, Liberty Bank of Buffalo. Mr. White has consolidated the 1042 replies received from various corporations into a 43-page booklet, *Industry's Challenge to Research*, which will be distributed nationally.

Although the survey was started before the national defense program was launched, army officials and the National Inventors' council noted that many of the products or processes mentioned would be useful in the preparedness program. These have been indicated in the booklet.

Purpose of Research Advisory Service is to refer industry's research problems to industrial laboratories, technical schools and trade associations co-operating in the program. Advising Mr. White are: Maurice Holland, director of the division of engineering and industrial research, National Research council; Dr. Henry A. Barton, director, American Institute of Physics; William Haynes, chemical economist; Dr. Harrison E. Howe, editor, *Industrial and Engineering Chemistry*; and Dr. C. H. Mathewson, professor of metallurgy, Yale university.

What Industry Wants

Some of the products and processes mentioned in replies to the questionnaire:

"Improvements in methods of aircraft construction, such as flush riveting or spot welding to achieve absolutely smooth external surfaces without introducing serious maintenance problems."

"Cement for quickly bonding rubber and metal."

"More uniform grades of foundry sand, probably synthetic."

"Boilers which will not accumulate slag."

"Free machining, heat and wear resistant steel bars suitable for machine gun barrels."

"Metal alloy that would resist pitting from electrical arcs."

"Stainless steel that has a yield point of 150,000 pounds per square inch. Such a material would be extremely valuable in aircraft construction."

Co-ordinated Policy, Price Control Advocated for Mobilization Plan

■ CHIEF defect of the industrial mobilization plan is its failure to provide co-ordination of fiscal and banking policy with direct price control, according to Dr. Charles O. Hardy, Director of a study of wartime price control conducted by Brookings Institution, Washington, and financed by Falk Foundation, Pittsburgh, Dr. Hardy undertook the project for the institution last year at the war department's request.

Based on assumption of a major struggle, involving transfer of a substantial part of the nation's productive resources to war goods manufacture, the study suggests the mobilization plan be amplified by provision for a war finance committee. Commission's responsibility would be to formulate general plans

co-ordinating fiscal, credit, foreign trade and wage policies. Its membership would include representatives of the treasury, the federal reserve system's board of governors, chairman of the price-control authority, and war industry, war trade and war labor administrators.

Price control machinery, Dr. Hardy recommended, should be unified and made to embrace all factors which make for price disturbance. A primary mistake in conduct of the World war, according to the study, was the delay in establishing price control machinery with authority extending to all aspects of the problem. Though a series of independent agencies with authority over particular groups of commodities was established, price controls were not co-ordinated with the price problem.

Nor were wage policies articulated with it.

Wisdom of vesting price control in temporary agencies rather than in permanent government departments was acknowledged. Energies of the government departments, reports the study, cannot be sufficiently freed for administration of war measures, and it furthermore is not desirable to give peacetime agencies the freedom and authority a wartime agency must have.

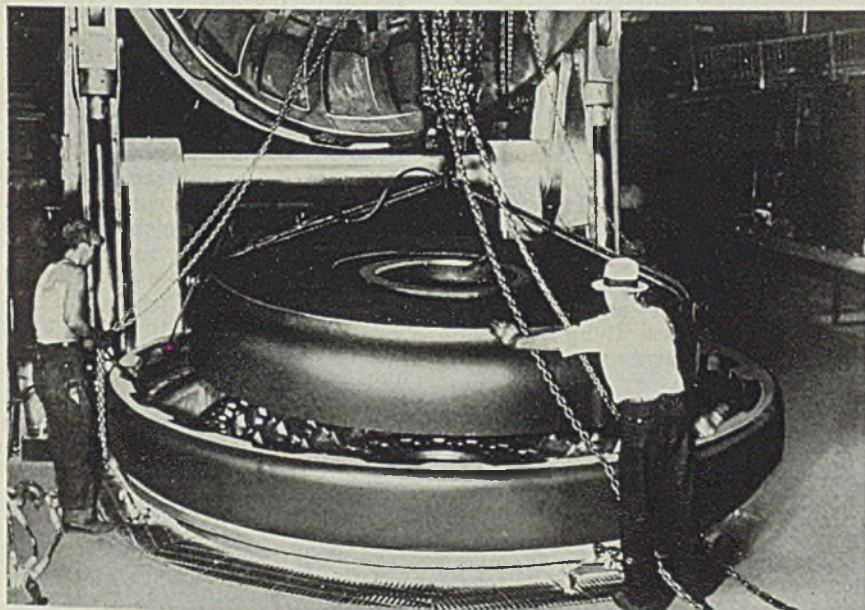
It is essential, the study declares, that government get most of its war funds from taxes and from loans paid for out of current income, with co-ordination of fiscal and banking policy of prime importance. While an excess profits tax properly drawn up may be useful in seizing windfall profits arising from war, it is pointed out, an excess profits tax cannot of itself prevent adverse effects of an inflationary fiscal program.

To maintain the system of private enterprise, some flexibility in price structure must be permitted to assist in allocation of resources and men for production of required war supplies. Maximum prices to be paid by the government for scarce essential war commodities, however, should be established by a central authority and all government buying should be so co-ordinated as to avoid competition for limited supplies.

Wage rates, the survey advocates, should be raised only to ensure health and efficiency or when made necessary by failure of other controls to keep down cost of living. Total wages, it is pointed out, will rise in any case due to increased working hours.

As a final means to solution of the problem, the study recommends suspension of all restrictions on production and hours. Emphasis, it says, must be placed on production of goods where restrictive policies have been in effect.

Steel and Aluminum Mold for "World's Biggest Tires"



■ Seven months of engineering and development work by the Firestone Tire & Rubber Co., with the co-operation of steel and aluminum foundries, preceded regular production of "the biggest tires in the world" recently.

The mold, with the bead rings, weighs 63,000 pounds and is made from six separate castings—two of steel, two of aluminum as tread rings, and two as bead rings. The bottom half of the steel mold weighs 29,500 pounds, the top half weighs 26,500 pounds. The aluminum tread ring weighs approximately 6000 pounds.

In Cleveland, the Otis Steel Co. cast the steel mold and the John Harsch & Sons Foundry cast the aluminum section. The Adamson Machine Co., Akron, O., with the mechanical division of the Firestone company, fit the molds and finished the tread designs. Jacket, or mold case, was cast by the Baldwin Locomotive Works in 1939.

Maximum overall diameter of the completed mold is 10 feet, 7 inches. This mold cures a tire that weighs 3646 pounds and is 9 feet, 6 inches in diameter in 15 hours. The tires will be used on earthmoving equipment.

British Columbian Firms Form Clearing House

■ West Coast Industries Ltd., Vancouver, B. C., has been organized to provide a single agency through which the Canadian government, its ministry of munitions and supply and other affiliated services may operate in dealing with British Columbian war industries.

New company's officers include: President, Col. H. S. Tobin, vice chairman, British Columbia division, Canadian Manufacturers' association; vice president, J. S. Eckman, vice president, Canadian Fishing Co.; secretary, P. W. Burbidge, Vancouver Iron Works. Directors are: Alexander McKelvie, Sumner Iron Works; William Vivian, Vivian Engine Works and W. A. Burnett, Victoria Brass & Iron Works.

Consult Field Purchasing Offices, Army and Navy Officials Advise

WASHINGTON

■ CORRESPONDENCE and visits to Washington by manufacturers, or their agents, seeking orders for army and navy supplies should be minimized, according to government officials in charge of procurement. Both services have established field offices in principal industrial centers to consult with manufacturers, and for army representatives to schedule emergency requirements with manufacturers.

Navy department centralizes the bulk of its purchases whereas the war department in general follows a policy of decentralization. Though as a rule bids are invited and awards made by the navy to the lowest responsible bidder, negotiated contracts may be used in cases in which competition is either impossible or detrimental to national interest. Items of normal usage ordinarily are purchased on a competitive basis whereas articles of a special or secret nature may be purchased through negotiated contracts.

Procurement activities of the war department in general are of two types: (1) current or normal purchases out of appropriations now available and (2) national emergency including long range planning for war, for which no appropriations are actually available, and which includes allocations to industries and plans for new or additional production.

Navy Buying Centralized

Navy in general adheres to a centralized purchasing system. The bureau of supplies and accounts is the central agency and either procures directly or has the supervision over the purchases of most of the materials required by the navy; the bureau of ordnance buys armor, projectiles and gun forgings and the ship bureau has supervision over the construction, conversion and repair of vessels.

Local purchasing agencies also have been established. Purchases of the field purchasing agencies generally are confined to items of small value, services which can only be supplied by local firms, materials the need for which is so urgent as to preclude advertisement by the bureau.

Under normal conditions the bureau of supplies and accounts itself contracts for approximately 60 per cent by money value of all purchases under its cognizance, while the remaining 40 per cent is handled by the several field purchasing offices. If perishable food stuffs are

excluded from consideration, the percentages become approximately 85 per cent for the bureau and 15 per cent for the local agencies.

Purchasing system of the navy is predicated upon sealed bids, opened in public on a pre-determined date. Only the bids of manufacturers or regular dealers are considered. Materials required are covered by written specifications. Alternate bids are considered but the right is reserved to reject any bid which does not offer specification materials. Bonds are required for the faithful performance both of bid and of contract obligations. Awards are made to the lowest satisfactory bidder.

Will Retain Present System

No changes in the navy's purchasing procedure are at present contemplated. It is anticipated that normal peacetime procedures will be expanded sufficiently to handle the increased work load arising from the emergency situation.

Authority to negotiate contracts contained in recent national defense legislation is intended to broaden and supplement, but not to displace, the present method of procurement by competitive bids. Negotiation will be resorted to only when advertisement and competitive bidding would be detrimental to the national interest.

Bureau of supplies and accounts regularly purchases or has direction of purchasing such things as iron and steel; aircraft and aircraft materials; automotive and railroad supplies; boilers and engines; machinery and equipment for the use of navy yards; and machine tools and accessories; ordnance material; metal lockers and furniture; and a wide variety of miscellaneous equipment.

Separate mailing lists of manufacturers and regular dealers, classified according to the commodities enumerated, are maintained by each of the purchasing agencies. Companies which are interested in receiving invitations to bid should apply for inclusion of their names in these lists of prospective bidders by addressing a separate letter to each of the purchasing agencies which they are in a position to supply. Such letters should state the commodities upon which bids will be submitted and give sufficient information to establish the qualifications of the company as a bona fide manufacturer or regular dealer in the materials which are offered to the navy. Personal visits of company representatives to purchasing of-

fices are not considered necessary by navy officials.

Navy field procurement offices are located as follows:

Alameda, Calif., Naval Air Station.
Anacostia, D. C., Naval Air Station.
Annapolis, Md., Naval Academy.
Boston, Navy Yard.
Charleston, S. C., Navy Yard.
Dahlgren, Va., Naval Proving ground.
Great Lakes, Ill., Naval Training Station.
Indian Head, Md., Naval Powder Factory.
Key West, Fla., Naval Station.
Lakehurst, N. J., Naval Air Station.
New London, Conn., Submarine Base.
New York, Navy Purchasing Office, P. O. box 9, station C. (Address, Officer-in-charge).
Newport, R. I., Navy Purchasing Office (Officer-in-charge).
Norfolk, Va., Naval Air Station; also Naval Supply Depot, Naval Operating Base (Officer-in-charge).
Pensacola, Fla., Naval Air Station.
Philadelphia, Navy Yard; also Naval Aircraft Factory.
Portsmouth, N. H., Navy Yard.
Portsmouth, Va., Norfolk Navy Yard.
Puget Sound, Wash., Navy Yard.
San Francisco, Navy Purchasing Office (Officer-in-charge).
San Diego, Calif., Naval Air Station.
North Island; also Naval Depot, Naval Operating Base (Officer-in-charge).
Washington Navy Yard and Naval Research Laboratory.
Yorktown, Va., Naval Mine Depot.

Communications should be directed to the Supply officer, except where otherwise noted.

All normal purchases of the war department are made after advertising for bids. Purchasing officers prepare circular proposals and invitations to bid. These papers list the items to be purchased, applicable specifications, state delivery points and dates, and furnish all the information necessary for a prospective bidder to calculate his costs and submit a bid. Bid bonds are frequently required. At the stated time, the purchasing officer, in the presence of those bidders who desire to be present, opens the bids. As a result of this procedure, the purchase contract is awarded to the best advantage of the government.

Invitations Widely Distributed

Circular proposals are given wide distribution in order to obtain the maximum competition. Newspaper advertising is frequently used.

Those concerns desiring to obtain war department orders should communicate directly with the purchasing agency engaged in procurement of those articles which the concern is in a position to supply. Invitations to bid will be forwarded them when purchases are to be made.

A great portion of the requirements of a military force are articles which are not in ordinary commercial production. These are such items as weapons, ammunition, and numerous special articles of transportation and communication equipment. For some of these, the entire applicable productive ca-

capacity of the country is insufficient to meet the requirements as to quantity and delivery dates. Several procurement projects are so large that no one commercial concern is equipped to meet the requirements of any of them.

To obtain the productive capacity required and to prevent delays, congress has authorized the award of contracts under special circumstances without advertising. This procedure is resorted to only to accelerate the present procurement program. Contracts of this sort are awarded to manufacturers whose facilities are known by the purchasing agency to be capable of the required production. The awards are made with a view of distributing the production load over available productive capacity.

Small Purchases in Open Market

Purchasing officers of the war department may purchase to the amount of \$500 or less in the open market. Purchases in excess of this amount may be made without formal advertising when authorized by the chiefs of the respective services.

Sometimes informal quotations are requested from several convenient sources of supply. The purchase order is issued to obtain those terms which are most advantageous to the government. Price and discounts, quality, and delivery are considered. Purchases of this sort are made, in general, at posts and stations to meet maintenance requirements when local procurement by pur-

chase offers advantages over procurement by requisition on military supply depots.

Military requirements are computed in advance. They are apportioned by the supply arms and services to procurement districts. The procurement planning officers in these districts search the areas to which they are assigned for the productive capacity necessary to meet requirements. Individual plants are surveyed, production studies are made, and in agreement with the management, plants are allocated for particular production during an emergency.

Management of plants having facilities which are considered suitable for the production of military equipment should communicate directly with the officer in charge of the procurement district which is nearest the plant for detailed information regarding this activity. These are:

Air Corps Procurement

Dayton, O., Wright field, (central office).
New York, Federal Office building, 90 Church street.
Santa Monica, Calif., 506 Santa Monica boulevard.

Corps of Engineers

Chicago, 1117 Post Office building.
Mobile, Ala., 212 Wilson building.
New York, 39 Whitehall street.
Philadelphia, Second and Chestnut streets.
Pittsburgh, 1012 New Federal building.
San Francisco, 409 Customhouse.

Ordnance Districts

Birmingham, Ala., 302 Comer building.

Boston, 2004 Post Office and Court House building.
Chicago, 309 West Jackson boulevard.
Cincinnati, The Engineer building.
Cleveland, 1524 Keith building.
Detroit, National Bank building.
Los Angeles, 409 Chamber of Commerce building.
New York, room 1214, 90 Church street.
Philadelphia, 1417 Mitten building.
Pittsburgh, 1032 New Federal building.
Rochester, N. Y., 1118 Mercantile building.
St. Louis, 935 Customhouse.
San Francisco, 118 Federal Office building.

Actual purchasing activity of the war department is specialized and decentralized. The greater volume of purchases is made by the depots and arsenals of the army. These specialize to a great extent in the articles purchased. Those facilities which are in production or are capable of production on any item of military requirements should communicate directly with the agency responsible for the purchase of that item. This communication should request that the name of the company be placed on the mailing list of the purchasing agency to receive invitations to bid when purchases are made of those items which the facility is in a position to supply.

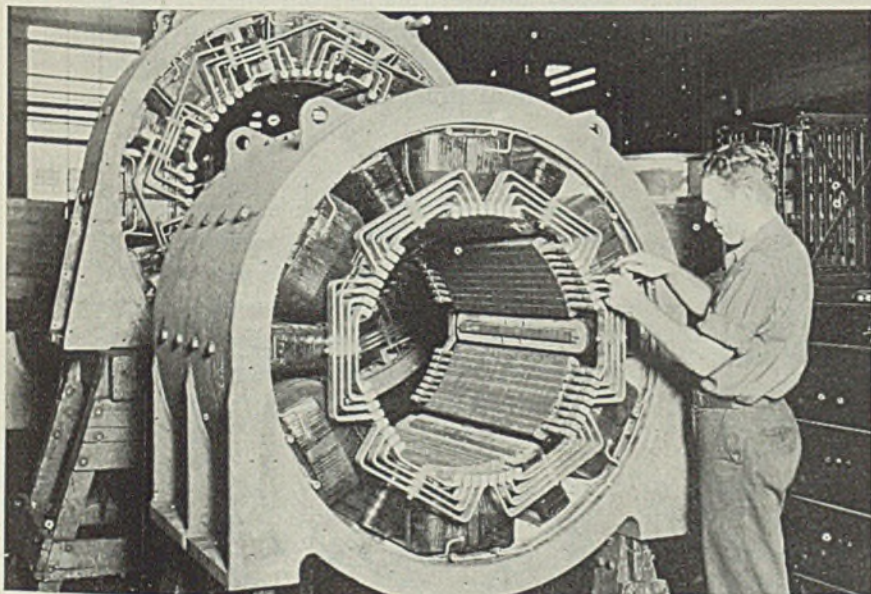
Ordnance department establishments listed below have been divided into two groups, A and B, for the purpose of classification of the commercial supplies each establishment usually procures from industry. Group A has been subdivided into two groups, A-1 and A-2, to designate the type of supplies or services these stations procure. Automotive equipment and maintenance supplies usually are bought by group A-1 and A-2. Iron and steel, aluminum, machines and machine tools also are procured by groups A-1 and A-2. The stations:

Ordnance Establishments—Group A-1
Frankford arsenal, Philadelphia.
Picatinny arsenal, Dover, N. J.

Ordnance Establishments—Group A-2
Rock Island arsenal, Rock Island, Ill.
Watertown arsenal, Watertown, Mass.
Watervliet arsenal, Watervliet, N. Y.
Springfield armory, Springfield, Mass.

Ordnance Establishments—Group B
Aberdeen proving ground, Maryland.
Augusta arsenal, Augusta, Ga.
Benicia arsenal, Benicia, Calif.
Charleston ordnance depot, Charleston, S. C.
Curtis Bay ordnance depot, Curtis Bay, Md.
Delaware ordnance depot, Pedricktown, N. J.
Erie ordnance depot, LaCarne, O.
Nansemond ordnance depot, Portsmouth, Va.
Ogden ordnance depot, Ogden, Utah.
San Antonio arsenal, San Antonio, Tex.
Raritan arsenal, Metuchen, N. J.
Savanna ordnance depot, Savanna, Ill.
Wingate ordnance depot, Fort Wingate, N. M.

Power for Basic Defense Industry



■ Direct current motor field yoke for a cold reversing mill to be installed in a Pittsburgh district steel mill receives inspection in Allis-Chalmers Mfg. Co. shops, Milwaukee. Motors for such uses, vital to the defense program, must be of especially sturdy construction to withstand shock loads

■ Revenue passenger miles flown by domestic air lines in August totaled 111,081,820, an increase of 8,700,000 over July.

Bottlenecks and Politics

■ DESPITE President Roosevelt's declaration of last Monday that the defense program is going "awfully well," many Americans would like more definite and detailed assurances that this really is the case. They fear that, at least to some extent, we have not yet gotten down to realities. They wonder whether politicians and professional labor leaders, at least to some extent, are developing a vested interest in the defense program—in terms of votes and union dues.

. . .

Unfortunately, there is ground for such suspicions. For example, certain factors are bound to influence prices. Government economists are determined—and this determination, incidentally, is shared by business leaders—that no upward spiral of prices shall be permitted to develop. Only week before last Defense Commissioner Leon Henderson threatened government control of nonferrous metal prices.

. . .

And yet it seems inevitable that prices must go up, and for causes originating in government. For one thing, taxes are bound to rise—and, as everyone knows or should know, taxes must be included in costs and handed along to buyers, thus increasing prices. Then there are the political considerations, the "gains on the social front." For example, time-and-a-half payment for overtime in excess of 40 hours, coming at about the same time as the military draft, is going to force a great increase in the amount of this overtime work if production is to be maintained and increased. More time-and-a-half compensa-

tion, of course, will push up costs and selling prices.

Then too, many persons would like to have satisfactory answers to questions that trouble them. They would like to know just why the proposal to locate a shell plant at Gadsden, Ala., came to be abandoned. They would like to know whether workers at some union-dominated plants are deliberately slowing down production. They would like to know the circumstances under which Elliott Roosevelt was appointed a captain in the army air corps.

They would like to know whether the defense program involves votes and patronage, and just what stake politicians and union leaders have in it.

. . .

Charges in high places about "sit-downs" and "profiteering" on the part of industry may delude some of the voters but the manufacturer sees them as part of a smoke-screen to divert blame from where it really belongs. He knows that the causes of bottlenecks in the defense program are to be found in Washington.

. . .

The bottlenecks will be eliminated and the execution of the defense program speeded to capacity only when it is placed in the hands of competent men—men who are interested in production rather than in votes, patronage and so-called "social gains"; men who have full authority to act in the best interests of our country.

EC Kreutzberg

The BUSINESS TREND



Activity Index Moving Steadily Upward

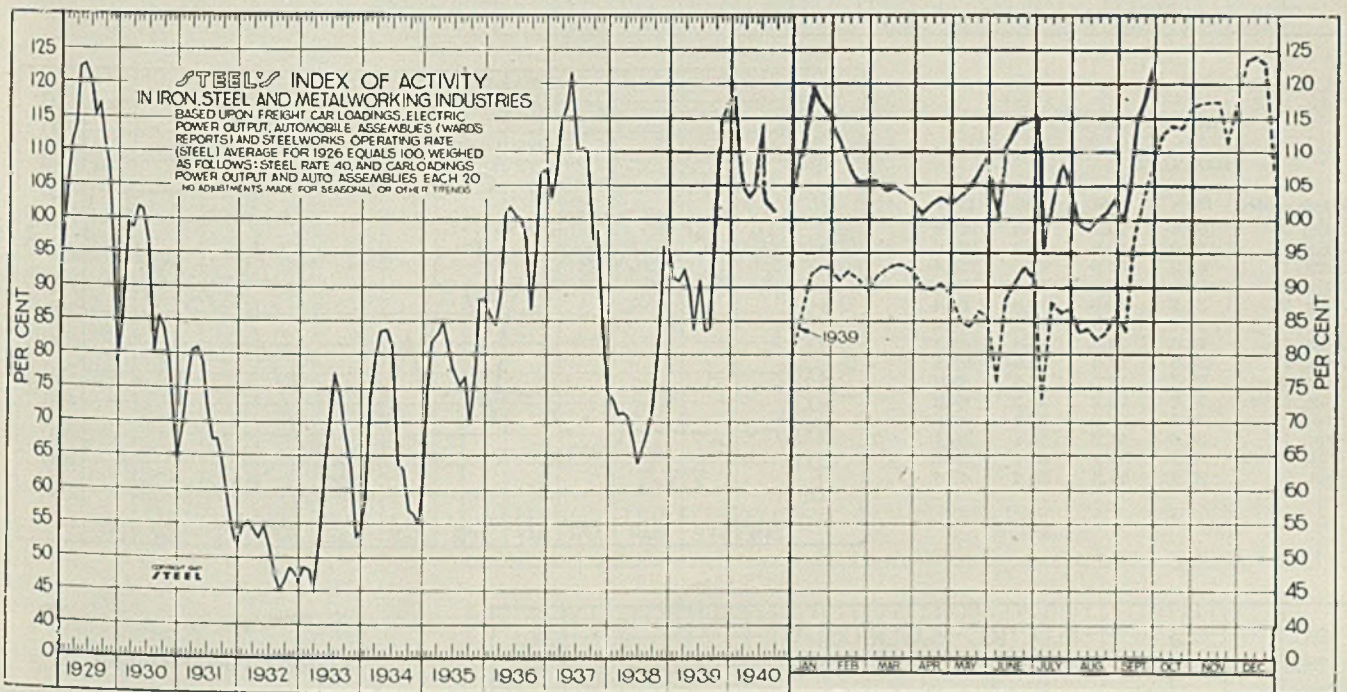
■ INDUSTRIAL activity is advancing more steadily than at any previous time this year. New volume of business is being distributed more widely than was the case during the spring and summer months and some of the principal lines of industry are establishing new high points for 1940.

Reflecting this improvement, STEEL's index of industrial activity, which stood at 117.8 for the week ended Sept. 21, advanced to 122.7 in the week ended Sept. 28.

The rather sharp gain of 4.9 points was accounted for by increases in automobile production, revenue

freight car loadings and electric power output. Steelworks operations, meanwhile, continued at 93 per cent of capacity.

Automobile assemblies in the last full week of September totaled 95,990. This represents a substantial gain over the 78,820 of the previous week and over the 64,365 of the corresponding week in 1939. Freight car loadings totaling 818,000 cars and electric power output amounting to 2,669,661,000 kilowatt-hours constitute new high weekly records for 1940. The steel rate has remained at the 93 per cent level for three consecutive weeks.



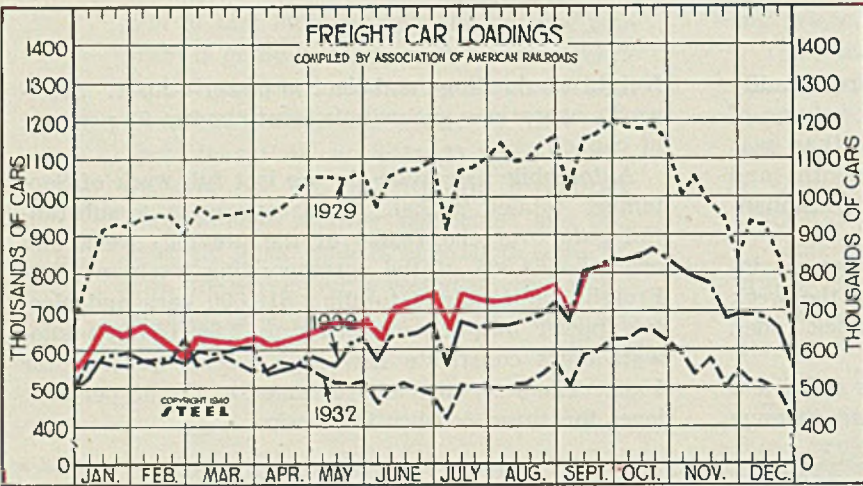
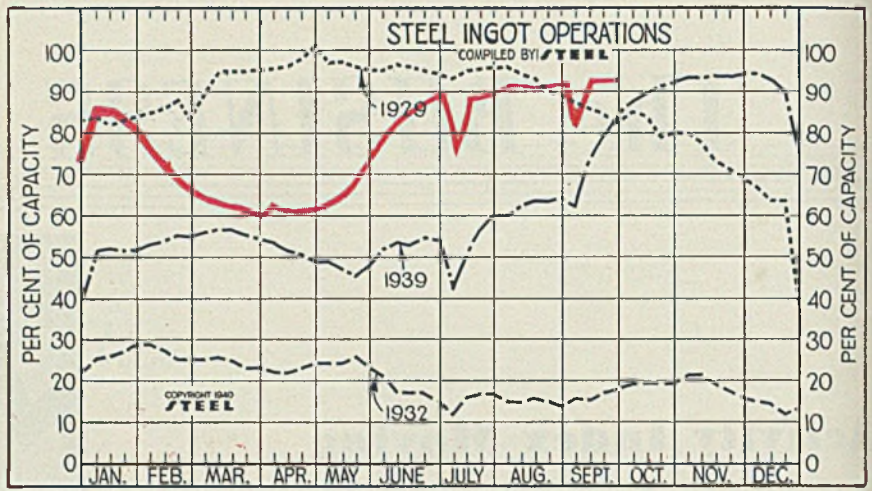
STEEL'S index of activity gained 4.9 points to 122.7 in the week ended Sept. 28:

Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
July 20.....	106.0	86.0	Jan.	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
July 27.....	103.4	86.8	Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
Aug. 3.....	99.7	83.5	March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
Aug. 10.....	98.5	83.9	April	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
Aug. 17.....	100.8	82.2	May	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
Aug. 24.....	101.4	83.4	June	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
Aug. 31.....	103.5	86.3	July	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Sept. 7.....	98.7	83.7	Aug.	101.0	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept. 14.....	114.9	97.5	Sept.	.....	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Sept. 21.....	117.8	103.0	Oct.	.....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Sept. 28.....	122.7	107.9	Nov.	.....	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
			Dec.	.....	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

Steel Ingot Operations

(Per Cent)

Week ended	1940	1939	1938	1937
June 29	88.0	54.0	28.0	77.5
July 6	75.0	42.0	24.0	74.0
July 13	88.0	50.5	32.0	82.0
July 20	88.0	56.5	36.0	81.0
July 27	89.5	60.0	37.0	84.0
Aug. 3	90.5	60.0	40.0	84.5
Aug. 10	90.5	62.0	40.0	84.0
Aug. 17	90.0	63.5	41.5	81.0
Aug. 24	90.5	63.5	43.5	83.0
Aug. 31	91.5	64.0	44.5	83.0
Sept. 7	82.0	62.0	41.5	72.0
Sept. 14	93.0	74.0	46.0	80.0
Sept. 21	93.0	79.5	48.0	76.0
Sept. 28	93.0	84.0	47.0	74.0



Freight Car Loadings

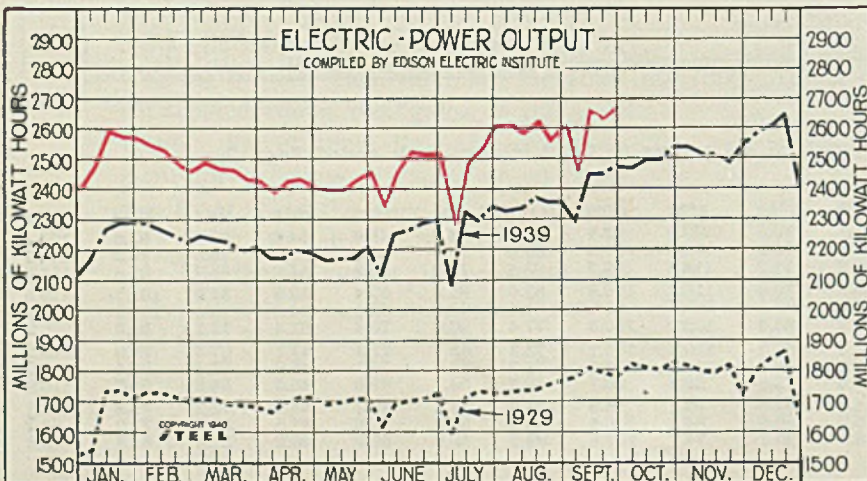
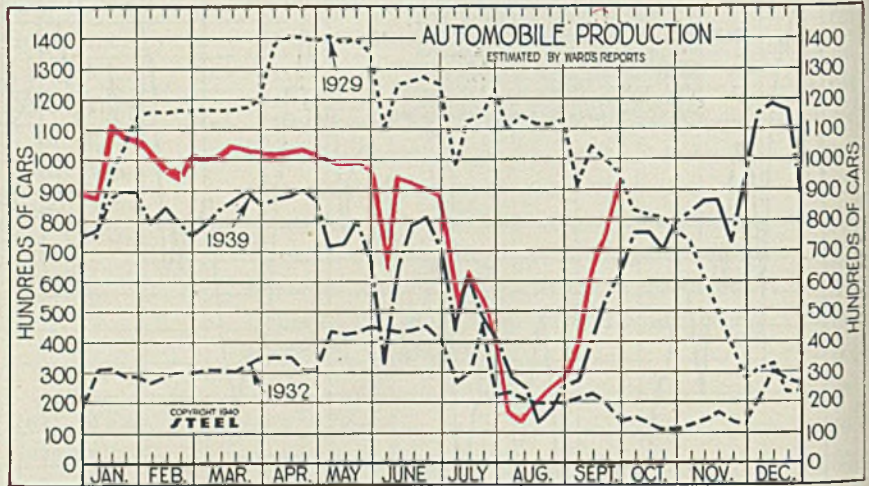
(1000 Cars)

Week ended	1940	1939	1938	1937
June 29	752	666	589	806
July 6	637	559	501	682
July 13	740	674	602	770
July 20	730	656	581	771
July 27	718	660	589	783
Aug. 3	718	661	584	770
Aug. 10	727	665	590	777
Aug. 17	743	674	598	781
Aug. 24	761	688	621	787
Aug. 31	769	722	648	805
Sept. 7	695	667	569	711
Sept. 14	804	806	660	827
Sept. 21	813	815	676	840
Sept. 28	818	835	698	847

Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
June 29	87.6	70.7	40.9	122.9
July 6	52.0	42.8	25.4	101.0
July 13	62.2	61.6	42.0	115.4
July 20	53.0	47.4	32.1	88.1
July 27	34.8	40.6	30.4	86.4
Aug. 3	17.4	28.3	14.8	78.7
Aug. 10	12.6	24.9	13.8	103.3
Aug. 17	20.5	13.0	23.9	93.3
Aug. 24	23.7	17.5	18.7	83.3
Aug. 31	27.6	25.2	22.2	64.2
Sept. 7	39.7	26.9	17.5	59.0
Sept. 14	66.6	41.2	16.1	30.1
Sept. 21	78.8	53.9	20.4	28.0
Sept. 28	95.9	64.3	25.4	45.8



Electric Power Output

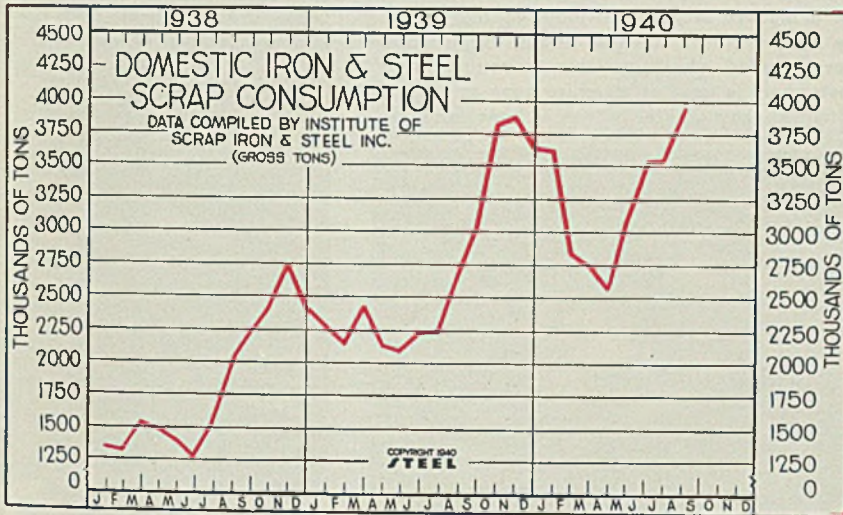
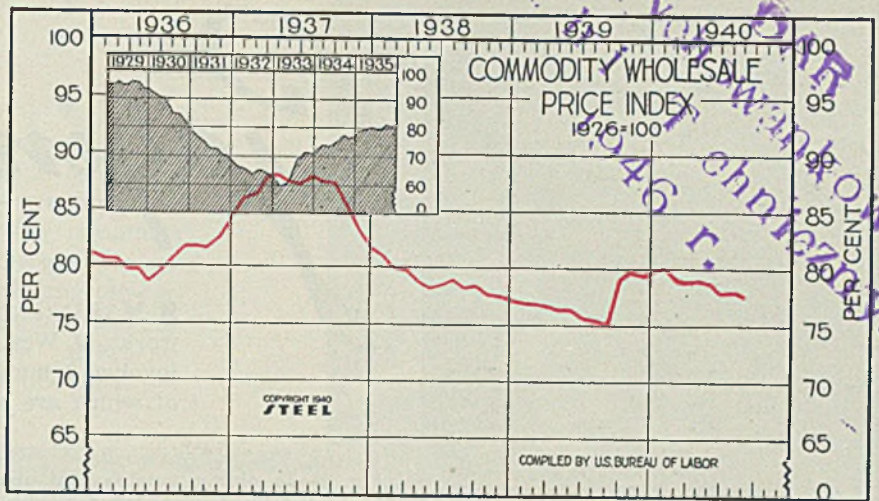
(MILLION KWH)

Week ended	1940	1939	1938	1937
June 29	2,514	2,300	2,015	2,238
July 6	2,265	2,088	1,881	2,096
July 13	2,483	2,324	2,084	2,298
July 20	2,524	2,295	2,085	2,259
July 27	2,601	2,342	2,094	2,256
Aug. 3	2,605	2,325	2,116	2,262
Aug. 10	2,589	2,333	2,134	2,301
Aug. 17	2,606	2,368	2,139	2,304
Aug. 24	2,571	2,354	2,134	2,295
Aug. 31	2,601	2,357	2,149	2,321
Sept. 7	2,463	2,290	2,048	2,154
Sept. 14	2,639	2,444	2,215	2,281
Sept. 21	2,629	2,449	2,154	2,266
Sept. 28	2,670	2,470	2,139	2,275

**All Commodity
Wholesale Price Index
U. S. Bureau of Labor**

(1926 = 100)

	1940	1939	1938	1937	1936
Jan.	79.4	76.9	80.9	85.9	80.6
Feb.	78.7	76.9	79.8	86.3	80.6
March	78.4	76.7	79.7	87.8	79.6
April	78.6	76.2	78.7	88.0	79.7
May	78.4	76.2	78.1	87.4	78.6
June	77.5	75.6	78.3	87.2	79.2
July	77.7	75.4	78.8	87.9	80.5
Aug.	77.4	75.0	78.1	87.5	81.6
Sept.	....	79.1	78.3	87.4	81.6
Oct.	....	79.4	77.6	85.4	81.5
Nov.	....	79.2	77.5	83.3	82.4
Dec.	....	79.2	77.0	81.7	84.2
Ave.	....	77.1	78.6	86.3	80.8



**Iron and Steel
Scrap Consumption**

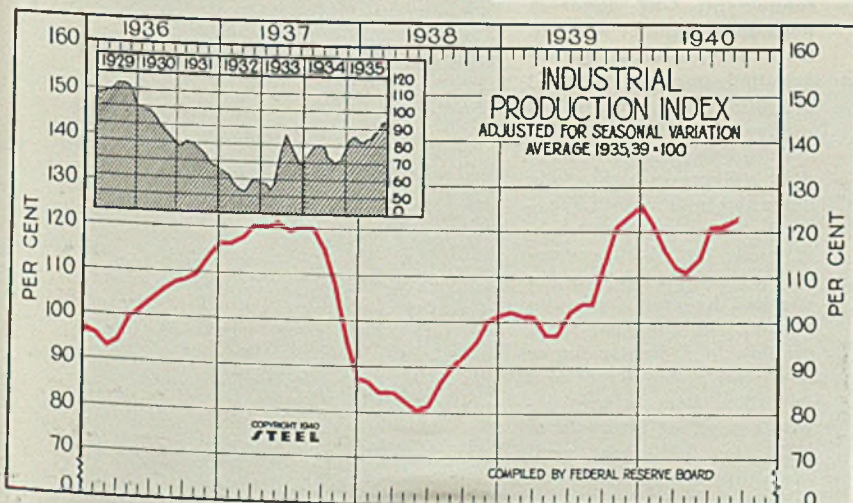
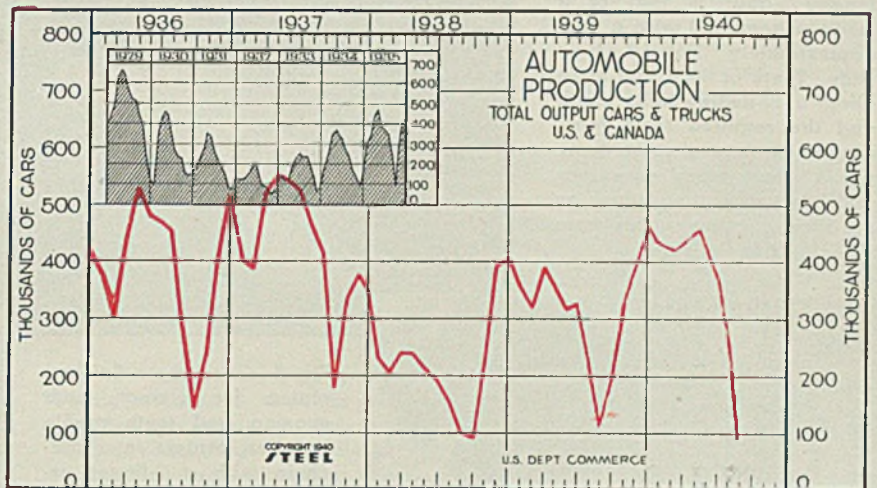
(Gross Tons)

	1940	1939	1938
	(000 omitted)		
Jan.	3,581	2,257	1,331
Feb.	2,812	2,124	1,306
Mar.	2,728	2,419	1,543
Apr.	2,548	2,114	1,477
May	3,061	2,079	1,387
June	3,482	2,221	1,257
July	3,526	2,247	1,520
Aug.	3,968	2,675	1,953
Sept.	....	3,018	2,218
Oct.	....	3,809	2,393
Nov.	....	3,858	2,732
Dec.	....	3,613	2,411
Total	....	32,434	21,528
Mo. Av.	3,213	2,703	1,794

Automobile Production

(Unit: 1000 Cars)

	1940	1939	1938	1937	1936
Jan.	449.3	357.0	227.1	399.2	377.2
Feb.	421.8	317.5	202.6	383.9	300.8
March	440.2	389.5	238.6	519.0	438.9
April	452.4	354.3	238.1	553.4	527.6
May	412.5	313.2	210.2	540.4	480.5
June	362.6	324.2	189.4	521.1	469.4
July	246.2	218.5	150.4	456.9	451.2
Aug.	89.9	103.3	96.9	405.1	275.9
Sept.	....	192.7	89.6	175.6	139.8
Oct.	....	323.0	215.3	338.0	230.0
Nov.	....	370.2	390.4	376.6	405.8
Dec.	....	469.0	407.0	346.9	519.1
Ave.	....	311.0	221.3	418.0	384.7



**Industrial Production
Federal Reserve Board's Index**

(1935-39 = 100)

	1940	1939	1938	1937	1936
Jan.	122	102	86	116	95
Feb.	116	101	84	117	92
March	112	101	84	120	94
April	111	97	82	120	99
May	115	97	80	121	101
June	121	102	81	119	103
July	121	104	86	120	105
Aug.	123	104	90	120	107
Sept.	....	113	92	115	108
Oct.	....	121	95	107	109
Nov.	....	124	100	95	113
Dec.	....	126	101	87	116

Gaging Gears

■ MAKING a wide variety of gears at the Nuttal works of Westinghouse Gearing division, Pittsburgh, involves a number of interesting gaging setups, a few of which are shown here. A third of the output of



Fig. 1—To obtain quietness of operation at high pitch-line speeds in a gear like this one for a modern locomotive, tooth contours must be true involute curves as nearly as possible. For detailed checking, this unusual Maag instrument is used to measure base or normal pitch at any angle between base and tip

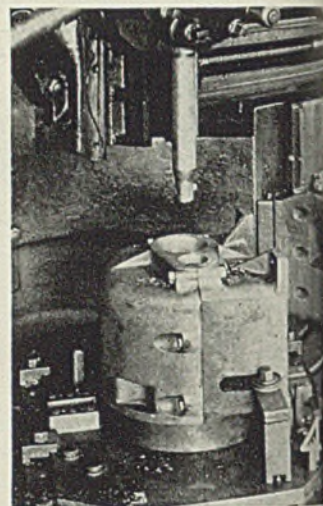
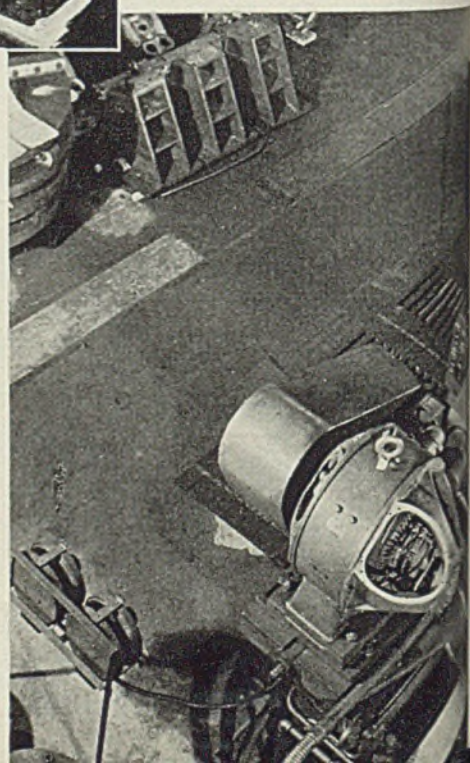


Fig. 4—One method of spacing bores in a gear case on a standard boring machine is by means of a fixture like this. The case is shifted from one doweled location to another to determine shaft centers within an accuracy of 0.001-inch

Fig. 2—For gears and pinions used in gearmotors a new method of final finishing, known as shaving, is used. In hobbing, an allowance of from 0.001 to 0.002-inch is made for metal to be removed in shaving. Gears are relocated in the machine from shaft centers, as in hobbing. The shaving cutter is a master cutter, circular in shape, with a diameter equal to that of a medium gear and with a face approximately $1\frac{1}{4}$ inches wide. Teeth of the cutter have about a 10-degree helix angle and the required tooth form. Across the face of these teeth are a great many serrations which act as cutting edges as the master cutter moves from side to side



Fig. 3—Checking a finished pinion for correct tooth spacing and tooth profile between centers in a machine with a 3-finger arrangement. One finger is positioned against a given tooth; second finger, spring actuated, provides constant pressure of the pinion against the fixed finger; the third finger actuates the dial indicator which reads deviation from correct spacing between adjacent teeth. A sine bar insures accuracy. Its setting is checked by precision gage blocks. For checking tooth profile, an indicator finger is placed at tooth root and deviation from a true involute read at intervals of 0.015 to 0.020-inch until tooth tip is reached. Tolerance for tooth profile error is 0.0002-inch



this plant is gearmotors, another third is separately coupled gear drives including both speed reducers and speed increasers for marine service. The remainder consists of gearing and current-collecting apparatus for the transportation industry. Use of tungsten-carbide turning tools and shaving machines for final finishing of gear teeth is routine practice. Other advanced machining methods are to be found here.

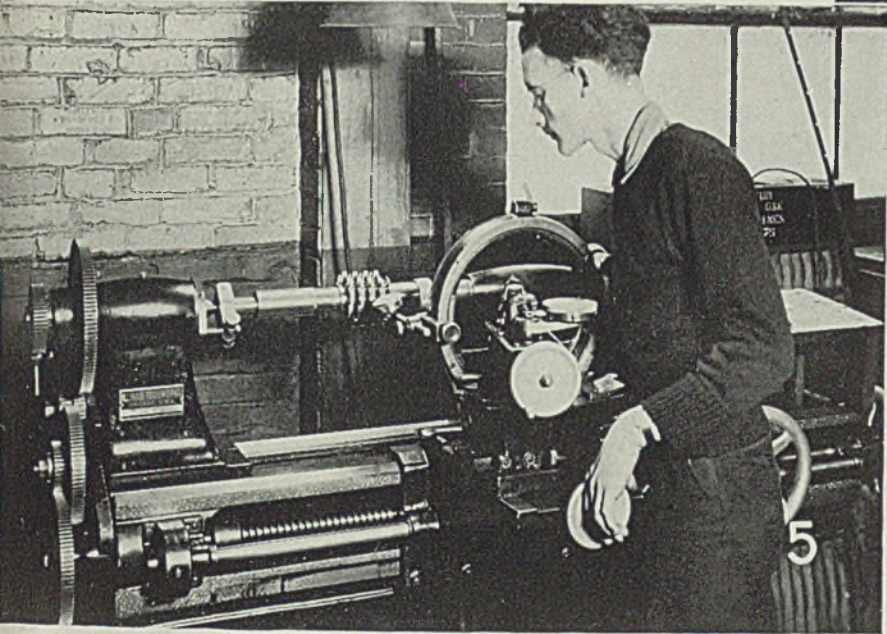


Fig. 5—All new hobs are checked to predetermined tolerances before use. A hob is mounted on an arbor located between centers of this machine. A master index plate for the required number of gashes insures proper indexing for gash spacing. A dial indicator finger checks deviation from correct gash-to-gash spacing and for deviation from a true radial cutting surface, both of which must be within 0.001-inch. Tolerance for cumulative gash-to-gash spacing is 0.003-inch. Lead, profile and eccentricity of cutting edges of 6 pitch and finer is 0.00025-inch for tooth-to-tooth lead spacing and 0.0001-inch cumulative tolerance end to end. Tooth profile tolerance is 0.0002-inch and outside diameter must be held within 0.0003-inch. Hub eccentricity and runout of hub face are checked to a tolerance of 0.0005-inch; bore tolerance is 0.0002-inch

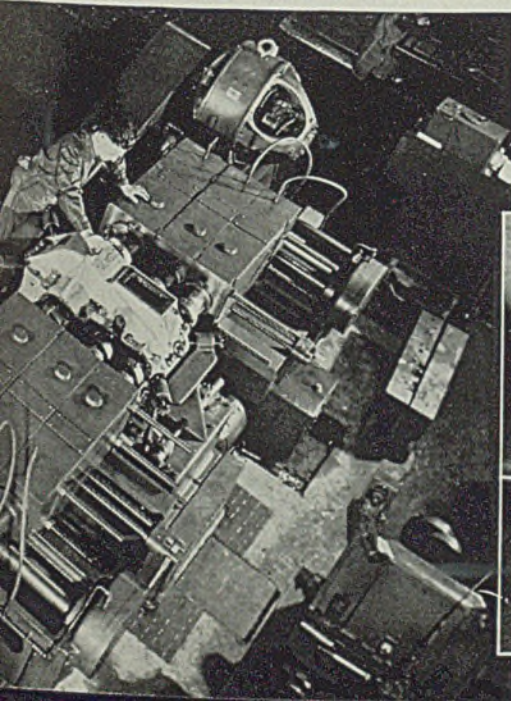


Fig. 7—This special 6-spindle boring machine is used for boring bearing seats in cases of double-reduction gears. Individual spindles are adjustable; center distances are set by means of gage blocks

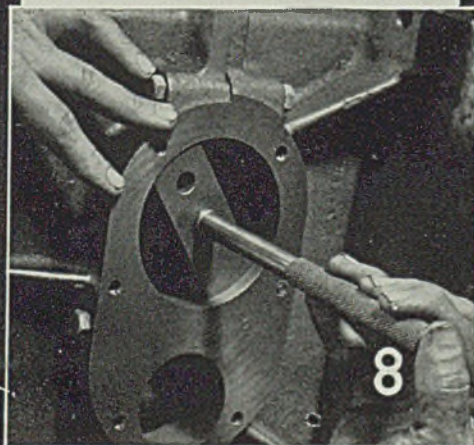


Fig. 8—Special spherical "go-no-go" gages, accurately lapped and chromium plated, are used for checking bore diameters on gearmotor frames

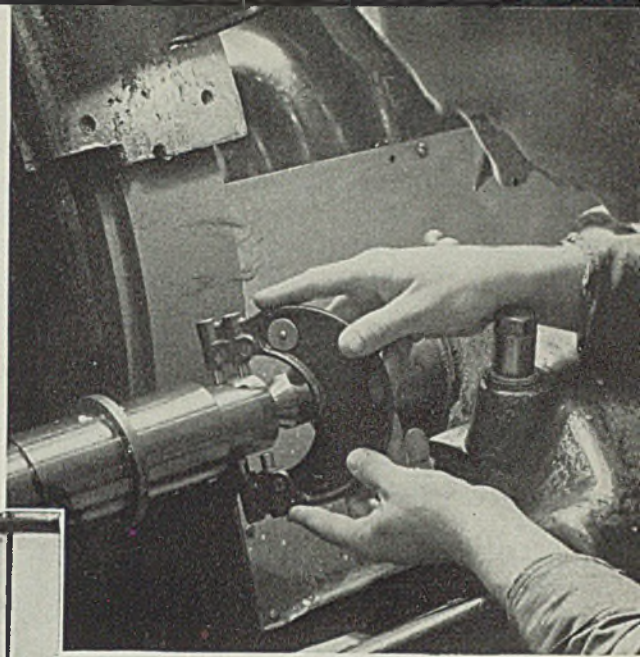
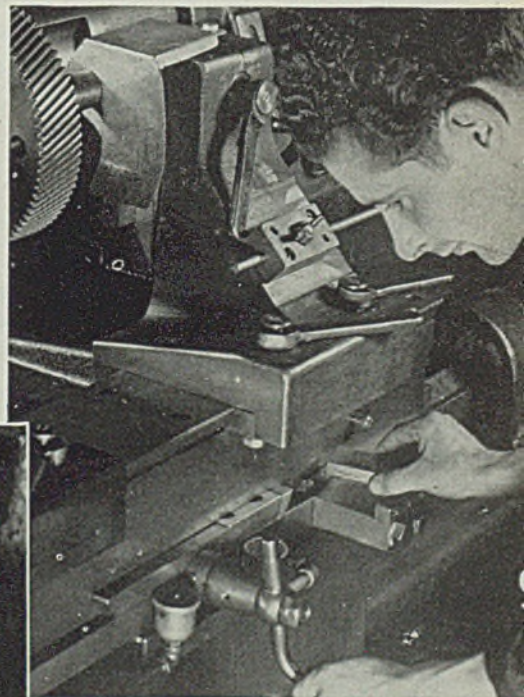


Fig. 6—Snap gages, set and sealed in the tool room, are used for controlling shaft diameters, whether used with bearings or pressed fits

Fig. 9—Gears to be mounted on accurately specified centers are run in on this machine. Centers are not read from a scale but are predetermined by the design engineer, after which a gage block is made with a dimension equal to the required center distance. This gage block, which protrudes from the front of the machine and is being inserted by the operator in this picture, controls center distance within 0.001-inch. Gears may then be operated at full speed and their operation checked on correct centers



By A. E. ABBOTT
Works Manager
G & M Mfg. Co.
Cleveland

All-Welded Diecasting Machine

Diecasting machine departs from conventional design to utilize heavy rolled steel plate and welded connections. The result is reduced maintenance. Less casting flash cuts finishing costs

■ FOR YEARS designers of diecasting machines have endeavored to find some method of resisting the high pressures developed tending to force the dies apart and resulting in excessive flash at the joint. Certain dies require extremely high injection pressures, values up to 5000 pounds per square inch not being unusual. With the molten metal being forced into the dies at such high pressures, tremendous forces are developed tending to spread the dies apart. When the machine is being operated at high production rates, these heavy "shots" of metal in rapid succession are apt to result in high maintenance costs. For instance, one plant encountered maintenance expense running as high as \$15 per day per machine.

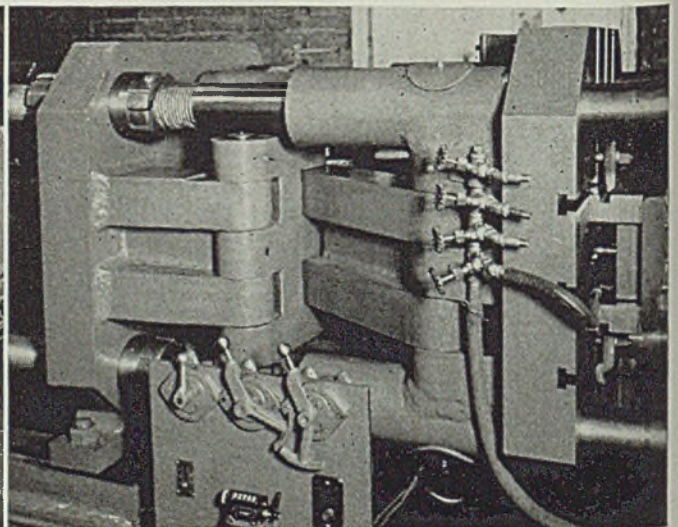
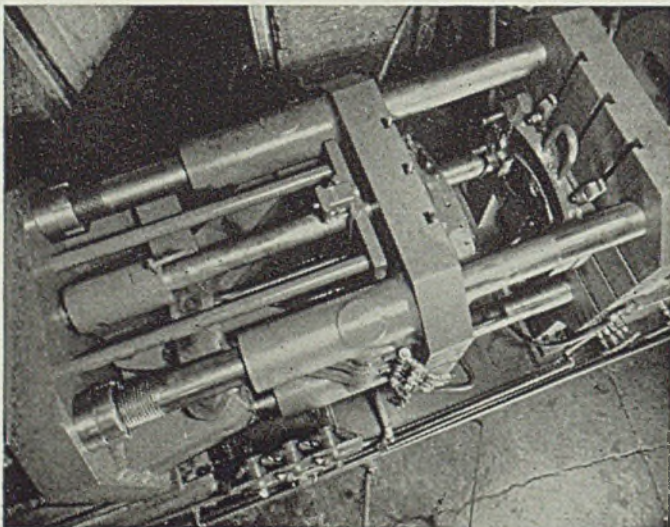
In an endeavor to develop a machine which would be sufficiently strong and rigid to make sound castings with little "flash" on high-speed production schedules over long periods of time, engineers of G & M Mfg. Co. turned to an all-welded construction after noting the excellent service records established

by welded parts which had been constructed in conjunction with repairing diecasting machines.

Theoretically, the perfect diecasting machine would be simply two massive blocks of solid steel with a die between them and a means of forcing molten metal into the die under great pressure. Such a mechanism would offer the absolute rigidity that all diecasters seek.

The high-pressure high-speed hydraulic diecasting machine shown in accompanying illustrations comes close to this ideal of absolute rigidity. It employs massive steel welded construction in the base, furnace, hydraulic fluid tank, shot cylinder, gooseneck support, cylinder mounting and cylinder head. Throughout the machine, few bolt or stud fastenings are used. Die plates are 6 inches thick and

Fig. 1, left, is oblique overhead view of toggle mechanism diagrammed Fig. 3 with dies at extreme right. Fig. 2, right, is closeup of toggle mechanism, movable and stationary plates. Note extremely massive construction. Tie rods are 4 inches in diameter, plates 6 inches thick



tie bars running through them are 4 inches in diameter. Such substantial units preclude the possibility of breakage and assure a rigid machine, combined with the heavy-duty toggle mechanism shown in Fig. 2.

Depending upon the die, pressures necessary to prevent spread of dies during casting easily run from 250,000 to 450,000 pounds. This machine is designed to withstand pressures up to 800,000 pounds. For making small simple castings without cores or complex parts and using automatic ejection, it is possible to operate the machine at a speed of 600 cycles per hour. Of course, with large complex diecastings, the rate may go as low as 15 cycles per hour. Due to the extremely heavy construction of this machine, it has been found to operate satisfactorily at rates 20 to 30 per cent faster than those usually practical.

The die is locked by a hydraulic cylinder which transmits power through the toggle mechanism diagrammed in Fig. 2. Shown in the closeup, Fig. 3, it also can be seen in Fig. 1. Toggle link mechanism is made exceptionally heavy to withstand the constant hammering of repeated shots of metal. Links are joined by 2 1/4-inch diameter chromium-molybdenum steel pins which have hardened and drawn steel bushings to give maximum strength. Bearing surface is 160 square inches per pin, each pin being about 20 inches long. An extra-heavy collar of metal around the link pins prevents distortion.

Base, plates, links, tank and furnaces are made

of SAE 1020 steel. This same material in the form of seamless steel tubing is used for the cylinders. The tie bars are SAE 1045 steel. The link pins are made of alloy high-tensile steel. Bronze bushings in the die plates are of high hardness.

In fabricating the welded head or die plates, see Fig. 7, the toggle link bracket is beveled 45 degrees in 1 inch around all four edges and set flush against the 6-inch thick die plate. No notches of any kind are made in the plate itself. The two are then joined using a low-carbon electrode with a total of ten passes. Each pass is peened. First pass is laid down with a 3/16-inch rod, and a 1/4-inch rod used on succeeding passes. About 230 amperes are used with the 3/16-inch rod and 305 with the 1/4-inch rod. Arc voltage is not more than 20 volts. Finished welds are annealed for about 5 hours at a temperature of 1750 degrees. Links for the toggle mechanism are

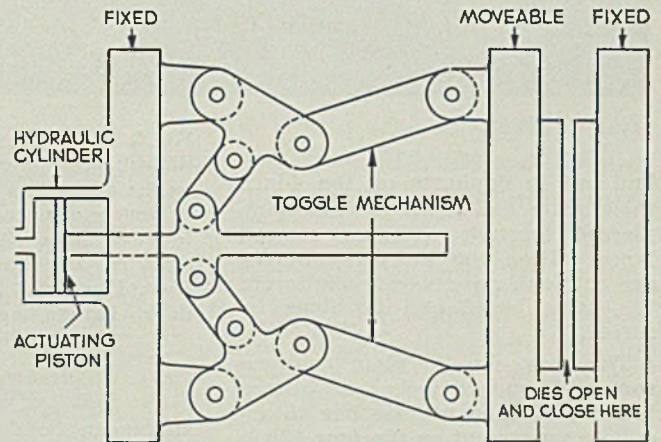
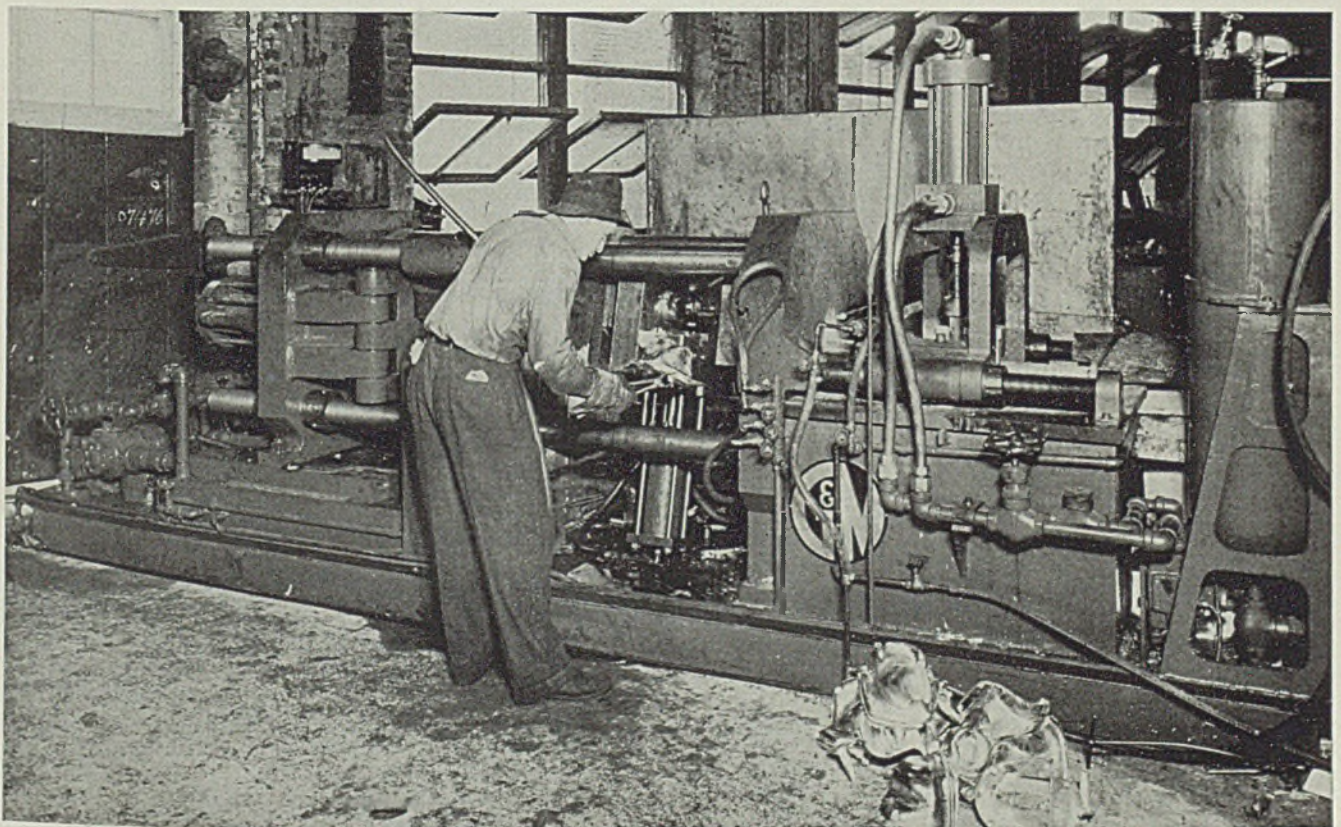


Fig. 3—Diagram of toggle mechanism shown at right

Fig. 4—The diecasting machine in production here has three hydraulic core-pullers which speed operation in making sections similar to those in Figs. 5 and 6



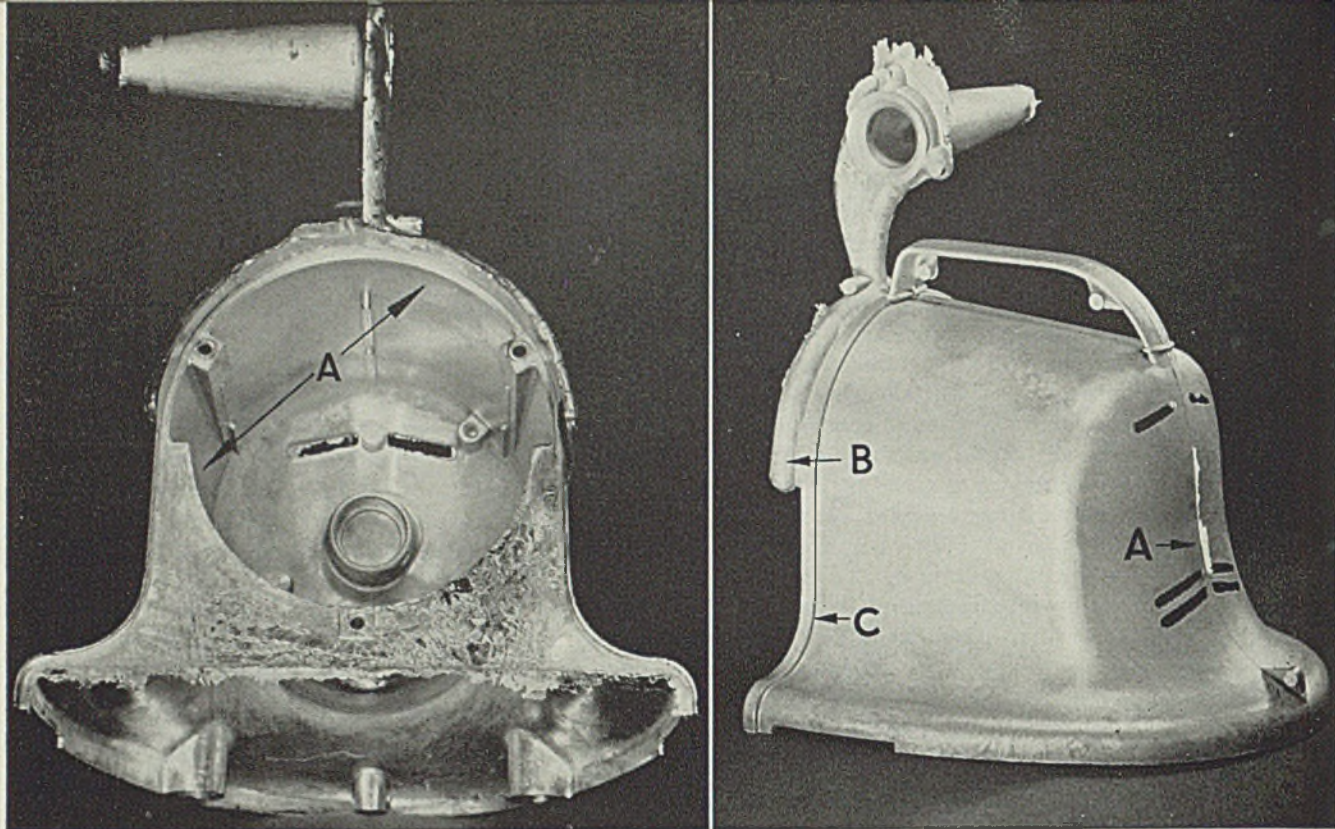


Fig. 5, left, shows back view of typical difficult diecasting job handled easily on the all-welded diecaster. Note flash at bottom of near surface is so thin as to have holes all through it. Fig. 6, right, is same diecasting viewed from front. Flash at A is less than 0.001-inch thick. Parting line above and below A has no flash whatever

laid out in duplicate on the 4-inch thick plate and holes for link pins pierced through with an oxygen lance. Then the links themselves are cut with an oxyacetylene torch, the holes bored and bushings inserted.

The movable die plate contains some 230 square inches of bronze bearing surface per tie bar to facilitate movement on the four 4-inch tie bars. This bearing surface is distributed over 22 linear inches of each tie bar to assure straight forward motion of the movable die plate, helping to reduce wear and breakage of die aligning pins. Grease reservoirs to lubricate tie bars and movable plate bearings are an unusual feature of this machine.

An important mechanical feature of the toggle linkage is that its actuating movement is stopped when the hydraulic piston comes in contact with the moveable die plate, as the die locks. Toggle movement stops when the links are just past dead center. This method of stopping places no strain on the link pins.

Die locking mechanism operates under a hydraulic pressure of 300 pounds exerted by the piston of the closing cylinder in Fig. 2. However, the toggle mechanism permits enormously increased pressure to be exerted on the dies. It has been estimated that maximum positive locking pressure of about 800,000 pounds can be obtained. With a diecast metal pressure of 4800 pounds per square inch and total casting area of 83 inches, maximum pressure exerted in forcing the dies apart would be near 400,000 pounds. Recent detailed tests have revealed that pres-

ures can be developed beyond 1,000,000 pounds without danger of shearing off the link pins or breaking the links themselves.

Tie bars are spaced on 24-inch centers. Die plates are 36 x 38 inches. The machine base is 48 x 192 inches with total weight approximately 19,000 pounds.

The improved diecasting performance obtained is well illustrated by Figs. 5 and 6 which show a difficult piece of work. Here a thin-walled large-diameter section is gated entirely from the top, yet almost perfect results are obtained with practically no flash. The tighter lock on the die makes possible greater pressure on the metal during the shot—this resulting in a denser and more uniform casting which can be made with closer tolerances, thinner and stronger wall sections, more complex contours and smoother surfaces as evidenced by Figs. 5 and 6.

Note the small flash at A, Fig. 6. This is approximately 0.001-inch thick and is a mere shred of metal, easily removed. Note also that on this same parting line above and below A there is no flash whatsoever.

Another interesting feature about this particular job is that the runner B cuts off about half way down the side instead of running down fur-

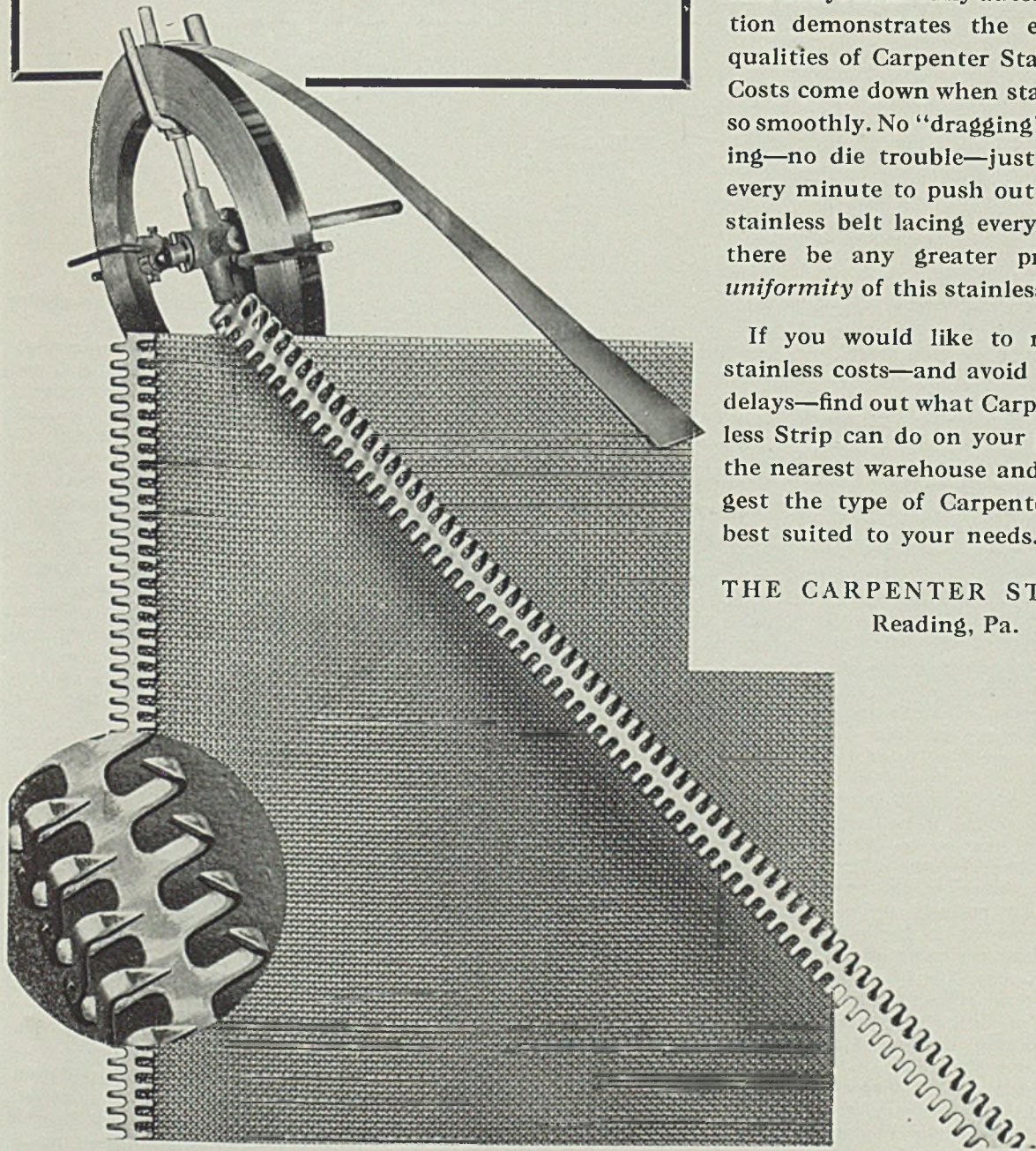
ther to a point near C, which would usually be the case. In fact, the particular designer of this die casting stated that the runner should be down to C if uniformly satisfactory results were to be obtained. However, with the runner only to point B, 100 per cent satisfactory die castings are being obtained on a high-production basis.

This permits not only a saving in die metal but also affords a most important finishing economy since less metal is to be removed. By cutting down amount of flash and permitting minimum runners, significant savings were made in cost of finishing this piece.

Fig. 5 shows back view of this same diecasting and reveals the extremely small amount of flash along the bottom edge. This is a mere trace of metal—so thin that it has holes in it in many places. No grinding is necessary to remove such a small amount of flash as it can be knocked off easily with a file or hard straight-edge of any sort.

The setup used to produce this piece and others similar to it is shown in Fig. 4. Here a G & M diecasting machine, as described, is employed with three hydraulic core-pullers which work cores in three different directions. For instance, the 6-inch diameter at A, Fig. 5, necessitates a 6-inch core in that direction as well as cores at the bottom for the holes there. These automatic core pullers permit extremely fast operation of the machine. Pieces shown in Figs. 5 and 6 are made at a rate of 200 per hour. This compares with a production of 160 units per hour, the previous maximum obtainable on other machines.

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Age Hardening Of Cold Reduced Strip

By PAUL J. McKIMM
Cleveland

Part II

■ CHANGE IN PHYSICAL characteristics of steels that are intentionally deformed by cold work in order to create false or imperfect value, should not be made the basis for argumentation because groups could be aligned on either side. Prof. H. H. Howe¹ states that recently deformed mild steel loses its elasticity. The effect of rest at room temperature is to slowly restore the elasticity and eventually to raise it above the load that caused the previous deformation. The effect of warming is to greatly hasten the recovery of elasticity.

J. Muir² points out that the elastic recovery of recently overstrained steel at 212 degrees Fahr. is as pronounced after three or four minutes as in two weeks at room temperature.

In the case of the mild sample no change was found in coiling in water or after heating to 482 degrees Fahr. After slightly deforming by tension, however, the material almost lost entirely its elasticity and recovered it gradually, the complete recovery being effected in about two weeks. The latter two claims are backed substantially by a large group of authorities, including the engineering division of the National Research Council.

It is known that elastic increases with cold work and "recovery" may be interpreted to mean recovery toward the steels' natural characteristics, which is a gradual drop in false elasticity.

Alastair Thomas Adams³, associate Royal Technical College, Glasgow, finds that cold work has a profound

effect on the elastic properties of metals. It produces in the metal a condition of imperfect elasticity. This condition, however, is not stable, and there is a tendency to return to the truly elastic state with time—a tendency which is greatly accelerated by heating to conservatively low temperatures.

Stretcher strains may be another example because after annealing, steel strip has a tendency to stretcher strain after cold passing thus creating a 2000 to 5000-pound false elastic and eliminating said strains. After resting at room tem-

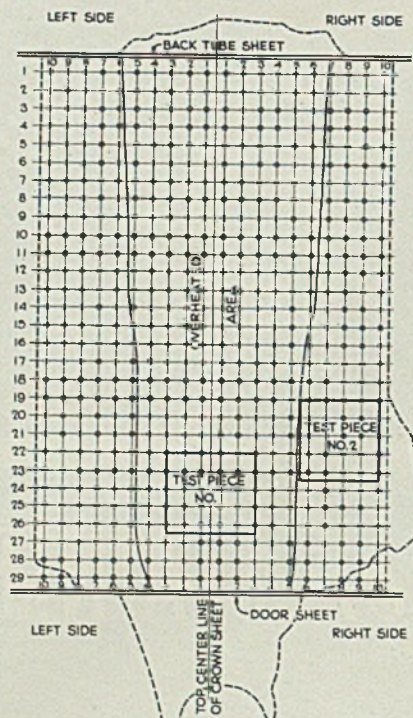
perature for sometime the strains return.

Steels having a carbon analysis in the ladle of 0.09, 0.11, 0.15 and 0.19 per cent carbon, respectively, were cold rolled 0.002; 0.004; 0.006; 0.008; 0.010 and 0.020-thousand, respectively, in order to create false elastic limits. Naturally with the increased amount of cold work deformation it developed a gradual increase in elastic limit and a considerable decrease in per cent elongation. Other than the gradual change of physical values the most important feature was that this material was fabricated into heavy engine frames and tested on a vibrating test equipment which is a standard test for the completed destruction and after 40 minutes the material broke like glass, denoting a marked embrittlement trend.

Although this phase of cold working is somewhat beside the point of cold reduced strip nevertheless it is closely related.

Requirements for high-pressure boiler material possessing high strength properties were difficult in past years for producers to meet though of late little material has to be rejected because of inadequate physical values. Of course this material is made according to the basic open-hearth and acid open-hearth method depending upon specification. Aging therefore depends mostly on the conditions of manufacture by either method, refining the bath before tapping and the method of deoxidation. High-pressure boiler plate is generally finished off the rolling unit at temperatures sufficiently above the upper critical so that further heat treatment is not necessary; in other cases strain relieving treatment is administered. If such material possesses normality or a state of equi-

Fig. 2—Location on crown sheet from which test pieces were taken

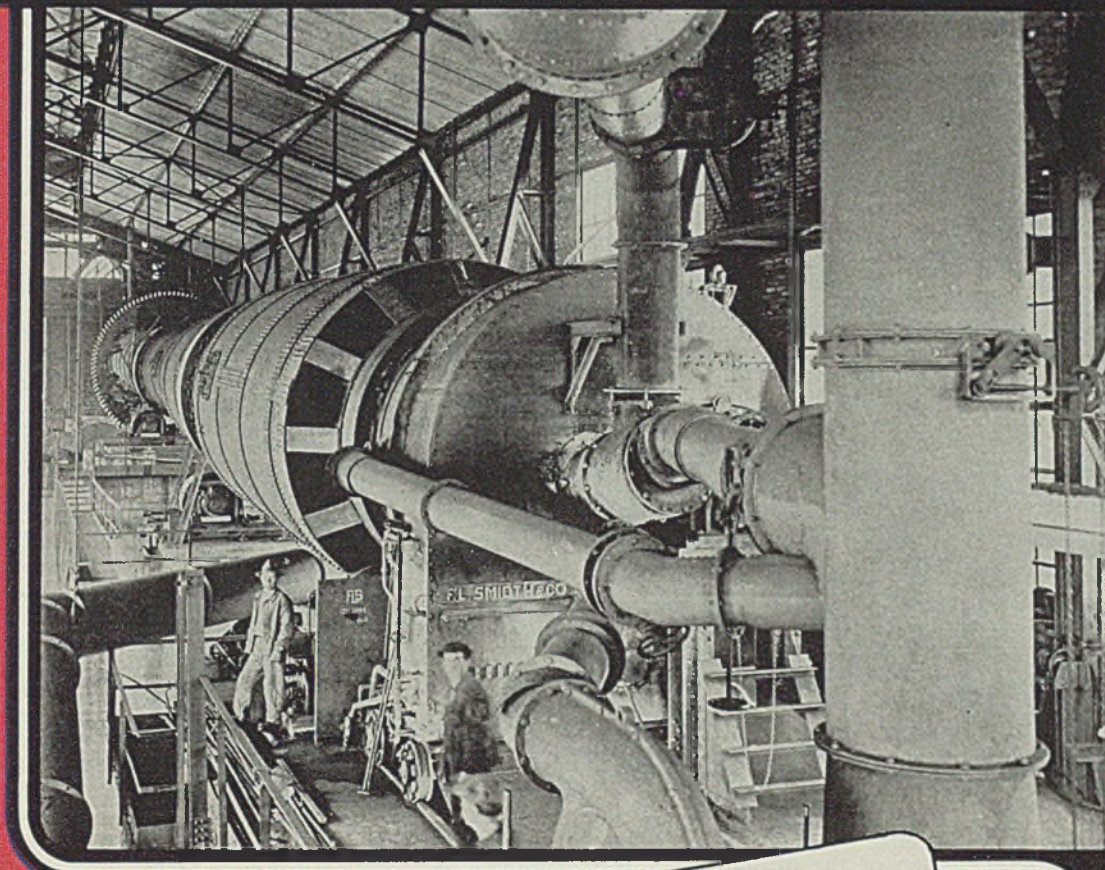


¹"Metallurgy of Steel," 1890, p. 212.

²"On Overstraining of Iron," Phil. Trans. Royal Society, London, 1900, p. 103 to 198 and, 1906, p. 77 to 277.

³"Wire Drawing and the Cold Working of Steel," p. 126.

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librium, aging effects are negligible. Further consideration must be given to construction because of the many sources of straining which can promote aging later and sometimes result in premature failures.

Irrespective of the careful selection of material and fabrication occasionally damage occurs. The most common, however, is formation of hair line cracks, running radially from rivet hole to rivet hole, which, owing to continuous stresses in service, penetrate deeper into the plate and become more extensive; caustic embrittlement attacks strain areas first. The principal source

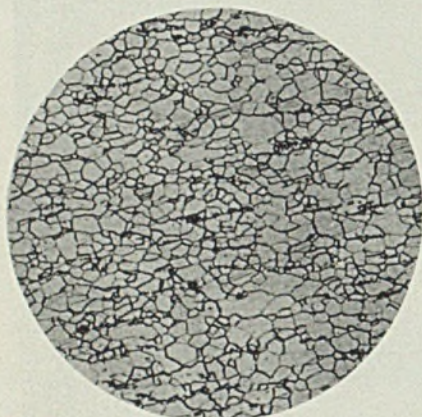


Fig. 3—Photomicrograph, 100X, showing imperfect microstructure

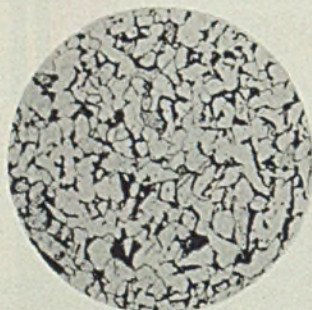
of straining is that of cold forging or cold impacting, stretching, hot flanging at improper temperatures, rash or high-pressure riveting. Practically every form of work has some straining effect which promotes deterioration of the ultimate results or service. The feasibility of strain relieving the completed construction has been discussed on many occasions. Then again, there are many features existent in service that exert straining and cause aging thus affecting extensive changes in the physical characteristics which have great influence on the performance, service and life of the construction unit.

Other important factors promoting changes in the metal of these heavy construction units, especially

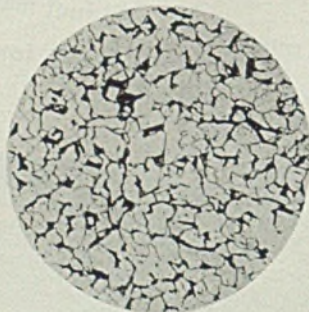
locomotive engines, are: First, caulking. Second, metal in the firebox is subjected to radical changes in temperatures as is evidenced by the fact that cracking from stay-bolt hole to hole is far more severe when such equipment is subjected to sub-freezing weather and to a far lesser extent during the warmer seasons. Third, natural expansions and contractions under operating conditions. Fourth, an intensification of expansion and contraction due to the quench or to sharp temperature changes when flushing out the boiler. Fifth, caustic embrittlement and fatigue.

Two cases of failure due to aging of master locomotive boiler sheets are cited. The first is one of a crown sheet which dropped because of low water causing a serious explosion. The original test was made five days after completion of processing or rolling from ingot into plate. The steel contained carbon 0.14 and 0.16; manganese 0.40; phosphorus 0.024; sulphur 0.027 and silicon residual per cent respectively. Acid firebox steel, rolled and sheared to $\frac{3}{8}$ x 72 x 126 inches. Tensile strength per square inch was 50,940 and 51,010 pounds per square inch and the elongation in 8 inches was 31.75 and 30.0 per cent. This crown sheet had been in continued service some eight years prior to the explosion. While the sheet was not questioned nevertheless it was

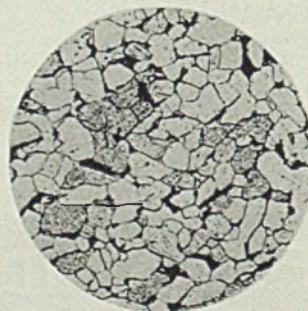
Fig. 4—Photomicrograph, 100X, showing Nos. 1 and 2 showing cleanliness of steel and freedom of inclusions



No. 1, Edge



No. 1, Center



No. 2, Edge



No. 2, Center

TABLE VI—Data Showing Trend in Aging

	Number 1		Number 2	
	Transverse	Longitudinal	Transverse	Longitudinal
Elastic limit, lbs./in. ² . . .	38,600	39,330	53,860	54,960
Tensile strength, lbs./in. ² . . .	59,000	60,640	64,480	64,900
Elongation, % in 8"	23.0	26.0	11.5	15.0
Bend Test:				
degrees	180	180	135	140
condition	Good	Good	Broke	Broke
Rockwell, scale B	Waterside, 55	Fireside, 58	Waterside, 70	Fireside, 74
Brinell, 3000-kg. load	Waterside, 112	Fireside, 112	Waterside, 131	Fireside, 143
Chemical Analyses:		Per cent		Per cent
Carbon		0.15		0.16
Manganese		0.40		0.38
Phosphorus		0.024		0.024
Sulphur		0.036		0.030
Silicon		0.003		0.003

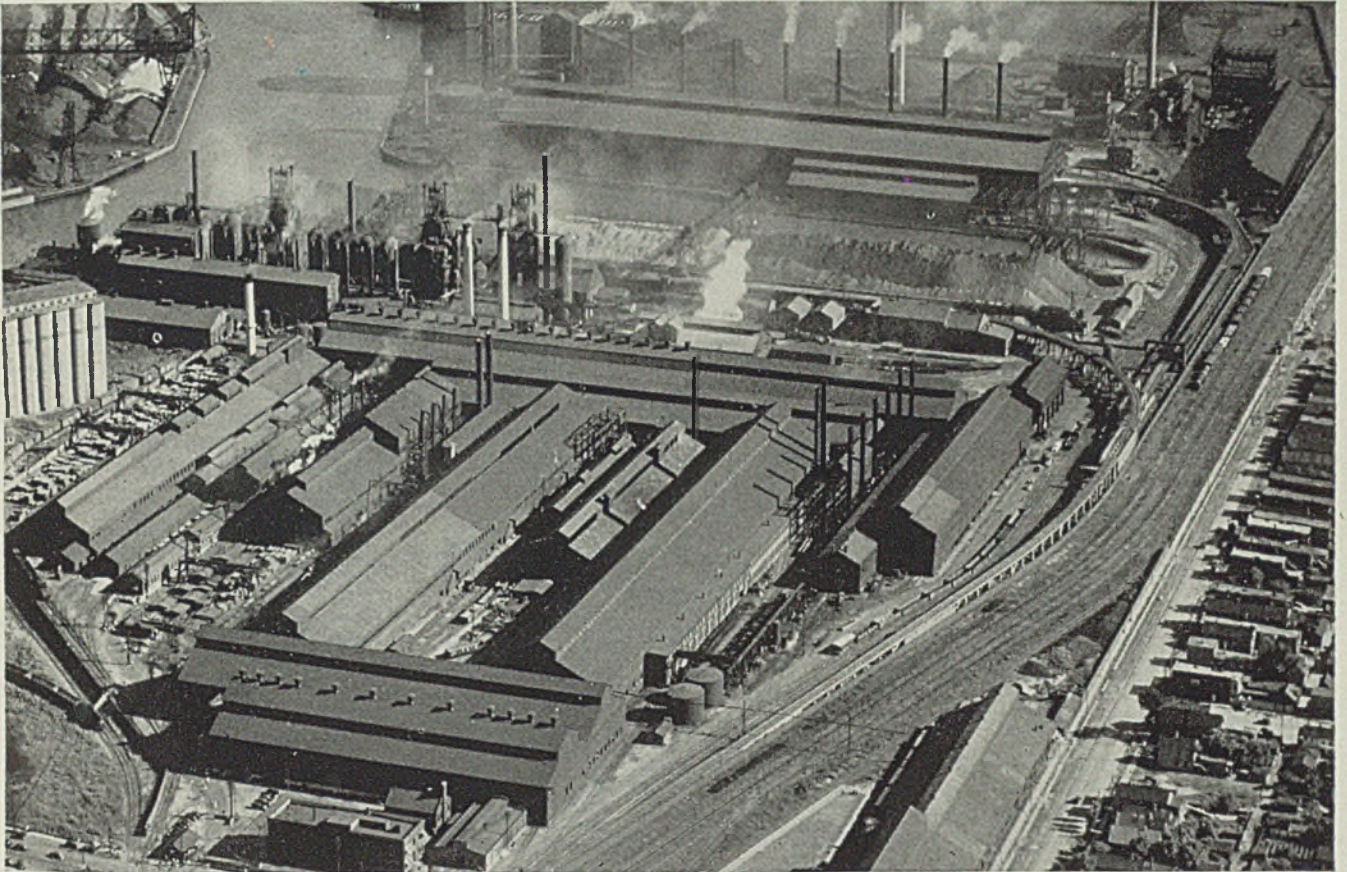
desirable to make a test. Fig. 2 shows the location of two samples of the crown sheet.

Table VI shows the trend in aging such as an increase of approximately 10,000 pounds per square inch in tensile strength and a decrease of 30.0 to 31.5 per cent in elongation. There is the difference between samples from two different locations of the same crown sheet where test piece No. 2, has an increase of over 10,000 pounds per square inch in elastic limit, about 4000 pounds per square inch in tensile strength with a sharp decrease in elongation from 23.0 to 26.0 per cent for test piece No. 1 to 11.5 to 15.0 per cent for test piece No. 2. The variance between these two samples is sufficient evidence to strongly indicate that service conditions are a powerful influence in causing strain reflecting in age hardening and promotion of embrittlement.

Photomicrographs at 100 diameters, Fig. 4, are representative of tests Nos. 1 and 2 of the test samples and clearly denote the cleanliness of the metal with freedom of inclusions and a good microstructure.

The second example is that of a firebox sheet, $\frac{3}{8}$ x 75½ x 147 inches, of a large locomotive. Tests Nos. 1 and 2 in Table VII are original having been made five days after rolling, while Nos. 3 and 4 were made after seven years of continuous service. These figures show a maximum change in elastic limit of only 5630 pounds per square

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inch, tensile strength of only 2060 pounds per square inch and a decrease of 22 per cent elongation in 8 inches. This is negligible under service conditions.

Some interesting details on high-pressure marine boilers and equipment of similar type is offered by McBrain⁴. He mentions physical tests made on steels after six or seven years service in which case the yield point was raised from 35,000 to 51,000 pounds per square inch under service conditions, resulting in the steel being age-hardened or age-embrittled. Samples from different railroads indicate the more the boiler is washed the greater the rate of increase of this yield point. This is also caused by stresses set up by natural expansion and contraction of the boiler under operating conditions, coupled with a quench hardening when washing out the boiler while at considerably high temperatures. Frequently temperatures are within or near the "blue brittle" range and result in premature cracking near the strained or stressed areas.

Cold reduced stripsheet as generally understood in the trade is produced from low-carbon rimmed steel, reduced to slabs and subsequently hot reduced by the continuous process into hot bands which are pickled and cold reduced to near the ultimate gage thickness, then box annealed, deoxidized and either roller leveled or skin passed (a light cold pass for tempering or setting stretcher strains). Aging or age-hardening has never been an issue at many plants producing this material. There is no reason to warrant the manufacture of the high cost nonaging grades of steel. During November, 1922 a large steel-maker decided to make some definite changes in steelmaking procedure. This was accomplished by processing a number of research heats propounding that higher quality, lower cost steel could be produced. The practice to some degree spread throughout the trade by the migration of superintendents, melters and other operators. No aging tests were made until the

TABLE VII—Tests of Firebox Sheet Before and After Service Conditions

Test No.	C.	Mn.	Phos.	S.	Yield point lbs./in. ²	Ultimate strength lbs./in. ²	Elongation, % in 8"
1	0.13	0.37	0.025	0.034	36,800	53,800	31.0
2	0.12	0.39	0.024	0.033	36,900	55,860	31.5
After Seven Years of Service							
3	0.11	0.36	0.016	0.037	42,320	55,760	22.0
4	...	...	....	....	42,440	55,060	23.0

steel from the changed practice reached the end stage of processing and it was definitely demonstrated that such steel aged only to a slight extent.

Irrespective of iron analysis or scrap it is essential to have sufficient limestone to establish the required flux as well as the proper supervision of the steelmaking practice to yield a good quality ingot consistently. The melting process must be done at high temperatures because it controls the completeness and speed of reactions and deoxidation. For example, one plant preceding the change, averaged 11,800 pounds of skull per heat but after the change only 700 pounds, thus indicating that heats were tapped and poured at least 25 to 75 degrees higher than the skulling temperature.

The amount of aluminum used in the deoxidation of rimming steel was reduced at one plant from 0.592 to 0.666-pound per ton to 0.100-pound per ton or less. In fact it dipped to as low as 0.010-pound of aluminum per ton of steel when the iron quality and analysis were constant because of blast furnace operation and not because of uniform iron analysis obtained by mixing different quality irons. With a given quality charge and sufficient flux, suitable deoxidation will evolve if the heat is properly shaped-up and refined due to the inherent silicon and manganese. This, of course, presupposes that there will be no loss of manganese during the last hour or so of the heat and that all heats will finish with a definite percentage of manganese irrespective of the

amount in the charge or of the ferromanganese added. On the other hand if the condition of the heat is not proper at the start of the shaping-up period, residual manganese will continue to decrease as long as any action exist.

Hence, say, with a given practice properly performed the residual manganese would be 0.14, 0.15, 0.16 or 0.17 per cent respectively. However, with an improper procedure, the residual manganese will recede to 0.11 per cent in which event even the small amount of aluminum required for controlling the rimming action will be erratic. Where the steelmaking procedure is correct, the total gases particularly oxygen, will be lower; hence, there will be less susceptibility to aging. A definite feature of the two different modes of practice is that steel properly made will not break or crack in the blooming mill while that poorly made will break during the blooming process depending on the amount of gases present.

Dr. Herty, Jr.⁵, brought out that four steels of 0.15 per cent carbon with high oxygen content gave an Izod value of 4.40 foot-pounds at room temperature compared with 20 foot-pounds at 40 degrees below zero; and, with low oxygen content an Izod value of 145 foot-pounds at room temperature compared with 110 foot-pounds at 40 degrees below zero.

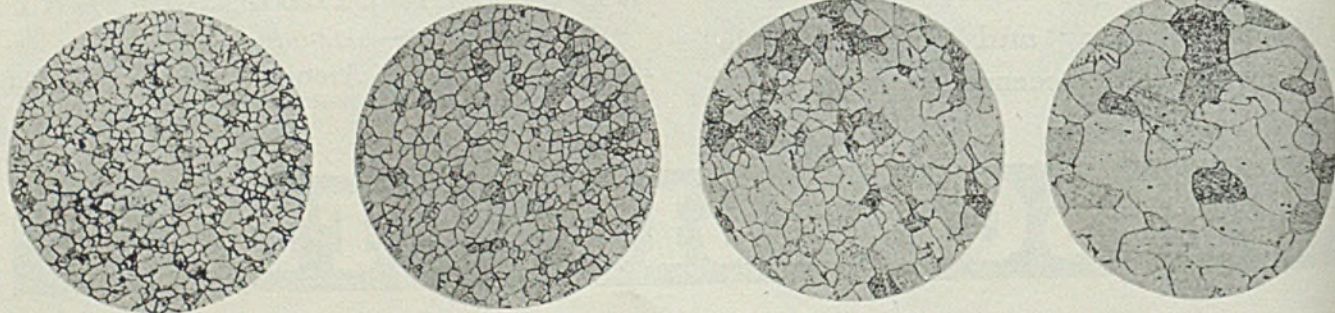
These same steels measured for quench-aging, he pointed out, were oil quenched from just below the lower critical and aged at room temperature for two weeks. High oxygen gained 10 points and low oxygen gained 2 points in rock.

(Please turn to Page 78)

⁴ "Official Proceedings of the Committee Reports and Special Papers," Master Boiler Maker's association, 1936.

Fig. 5—Photomicrographs, 100X. of annealed steel showing well-defined grain with sharp demarcation of boundaries (left) and larger grains (right)

⁵ Symposium on Slag Control and Steelmaking, A. I. M. E. Metal congress, New York, Oct. 1934.





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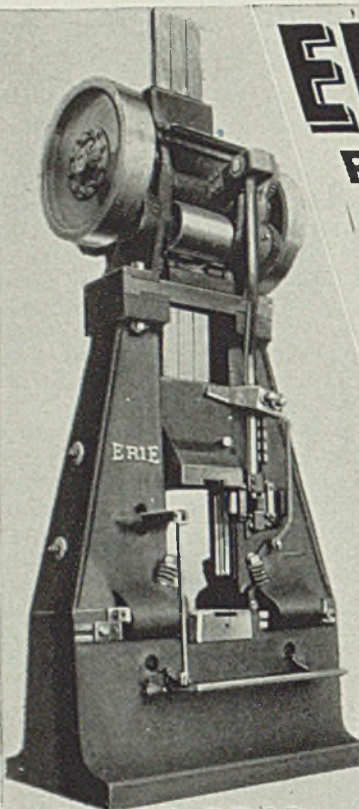
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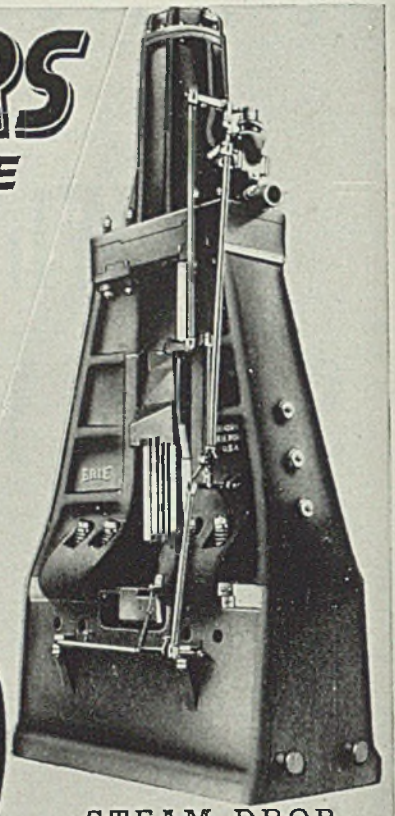
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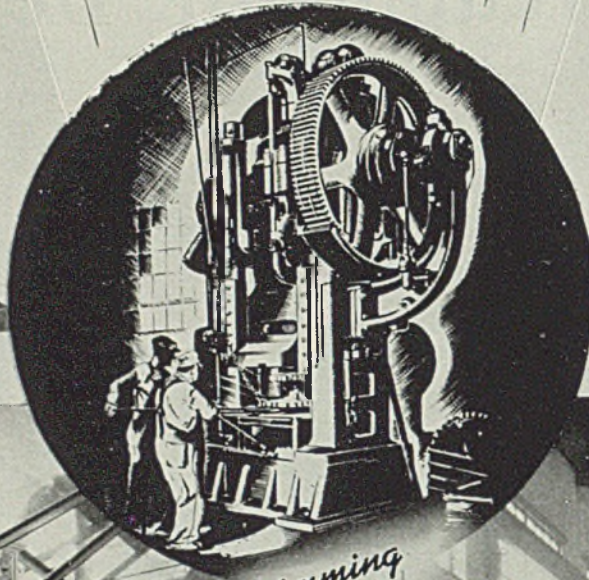
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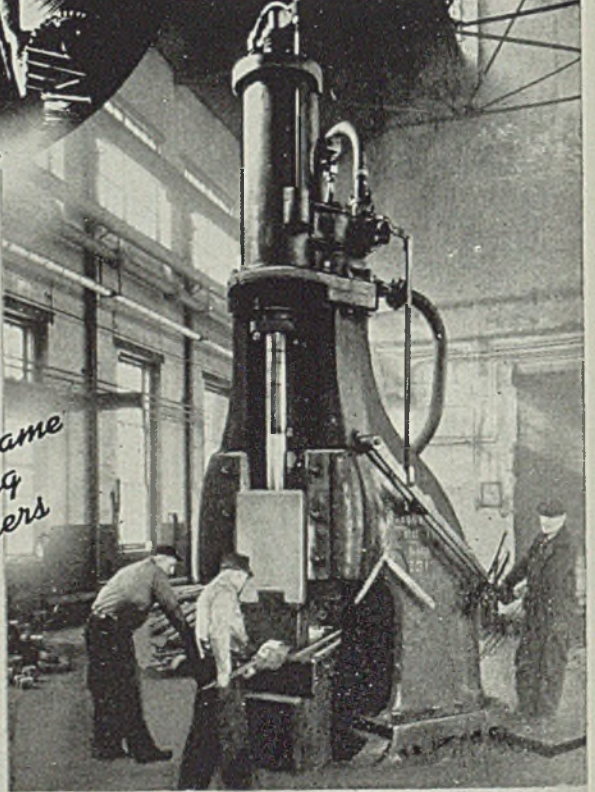
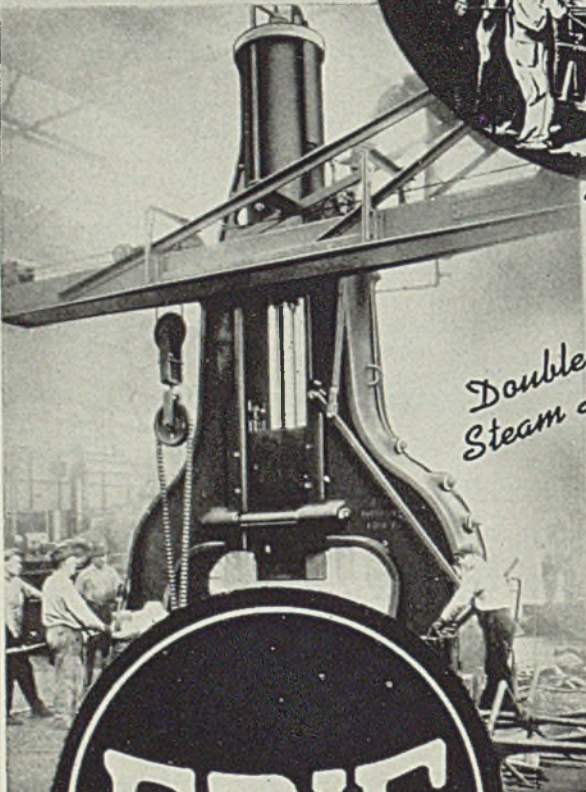
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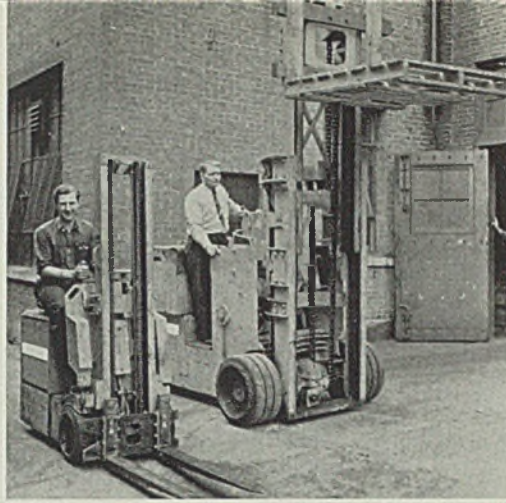


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Fig. 1—Largest and smallest, 10,000 and 2000-pound, battery-operated fork trucks used at General Electric Schenectady works



Fork Trucks and Pallets

By cutting out steps in the handling cycle, fork trucks move stock in unit loads on pallets to show about 50 per cent reduction in handling costs. System capable of handling almost anything

INDUSTRIAL plants as a whole have so intensively modernized their machinery without equivalent modernization of their material handling methods that further gains in manufacturing efficiency are easier to achieve by revamping material handling methods than any other way.

Profits depend on how cheaply raw materials can be brought into the front door and the finished product delivered out of the back

From paper presented before American Management association, conference of Production division, May 22-23, New York.

By H. J. BEATTIE
Supervisor Material Handling
Manufacturing General Department
General Electric Co.

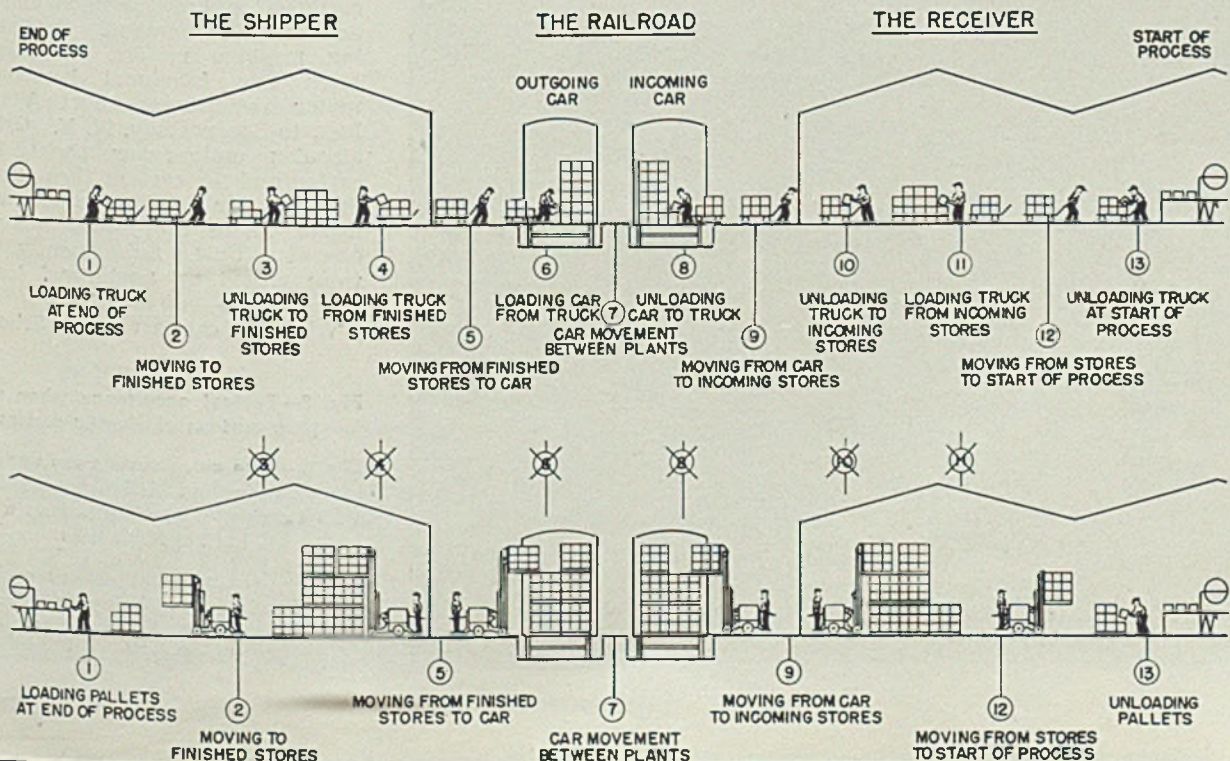
door. In other words, profits depend to a large extent on how much or how little it costs to handle material through production or fabrication operations. Manual han-

dling is as wasteful and inefficient as handicraft production in view of the many recent advances in handling methods and equipment.

Material handling is either lifting or shifting. There are three fundamental types of equipment to do the job mechanically—hoists and cranes, conveyors and trucks. Trucks are considered here.

Over 1,000,000 tons of materials are received each year in the nine apparatus works of the General Electric Co. The cost of handling this material is equivalent to 28 per cent of direct labor. About three years ago fork trucks were intro-

Fig. 2—Upper diagram shows handling sequence when moving material by hand trucks or trailers. Lower shows how six steps are short circuited by moving material with pallets and fork trucks



duced in our various works and their use, combined with the pallet method of packing in unit loads, has been the direct cause of cost reductions amounting to 50 per cent on the average.

The equipment necessary for handling material in unit loads consists

of trucks and pallets. Fig. 1 shows a large 10,000-pound capacity fork truck and a small 2000-pound truck. It is generally agreed that the 2-wheel stevedore hand truck is the most adaptable tool for handling materials. Actually the fork truck is a stevedore's hand truck mech-

anized and with the added advantage that it can elevate and tier the loads. The average fork truck now in service in our plants is equipped with a telescopic mast so with its collapsed height of 83 inches, it can enter freight cars and with mast extended can tier in the warehouse to 120 inches on the top of the forks. There are trucks that tier to a height of 22 feet.

A pallet is shown on the forks of the larger truck, Fig. 1. Cost of pallets is relatively small as they are constructed from inexpensive lumber consisting of three runners with cross boards nailed on the top and bottom. For some storage purposes we have made them out of scrap lumber for 15 cents each. A convenient size of pallet is 48 x 48 inches.

Unit-Load Method Economical

The major differences between the older methods of moving materials by hand trucks and the newer pallet fork truck method are shown graphically in Fig. 2. The upper half represents the movement of materials by hand trucks. It covers the cycle from the shipper's plant to the first operation in the receiver's plant. The lower half represents the same cycle of operations when the movements are made on pallets with the aid of fork trucks.

In the normal cycle of operations the 13 former separate handlings are reduced to 7. Furthermore, the old method of moving in small packages means breaking bulk lots and costs at least 25 cents per ton each time the goods are picked up and laid down while the unit-load method costs not over 8 cents per ton on the average.

Figs. 3 and 4 illustrate a typical cycle of handling by the old "one carton at a time" method and the new unit-load method. Refrigerating machine motors are shipped from our fractional horsepower motor department, Fort Wayne, Ind., to Schenectady, N. Y. Originally four motors were packed in a carton and the cartons then stacked on skids for delivery to the warehouse where they were unloaded one at a time. Subsequently they were picked up again and loaded in a box car—one at a time.

When the cars arrived in Schenec-

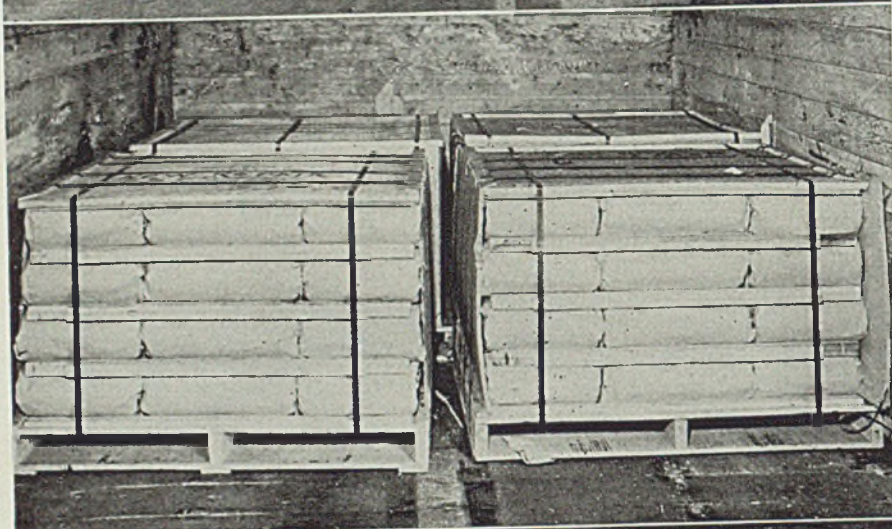
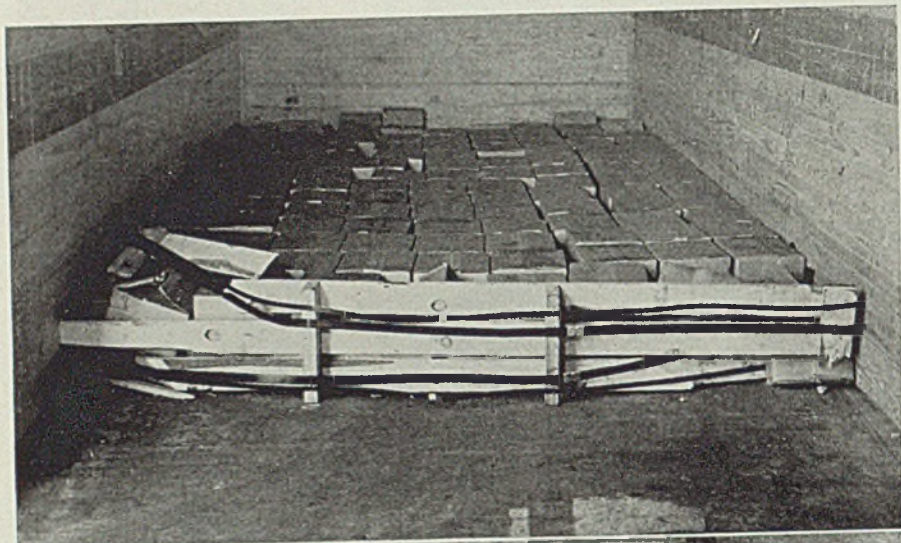


Fig. 3—Typical occurrence when shipping cartons of electric motors

Fig. 4—Here same motors are wrapped in wax paper and 0.005-inch kraft paper, wire strapped on pallets to form a unit load of 200 motors

Fig. 5—Even unusual shapes such as these insulators are being handled efficiently on pallets by fork trucks—and tiered safely, too

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F-8451-A.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.
DEPT. 7-N

EAST PITTSBURGH, PA.

J-21059

Westinghouse Weld-O-Trol



tady, Fig. 3, the "one carton at a time" process was reversed until finally the motors were delivered to the refrigerator conveyor assembly line. Note the gate used to keep the motors from shifting during transit has given way, damaging some of the motors—a frequent occurrence with this method of shipping.

Now 200 motors are strapped on a single pallet to form a unit load as they come off the Fort Wayne conveyor. The unit loads then are tiered in the warehouse and subsequently shipped in box cars, Fig. 4, with no bulk heads or bracing, commonly termed a "floating" load. This method has eliminated damaged motors. In Schenectady the motors are stored and delivered to the refrigerator assembly line in the same original unit load. The empty pallets and spacers are wired together and returned to Fort Wayne.

Practically all classes of materials can be loaded and tiered on pallets. The items shown in Fig. 5 are porcelain insulators, selected for presentation here to demonstrate the safety of this method of handling. The insulators are stacked loose on the pallets with cardboard separators between the layers which tie them in sufficiently to prevent jarring off during transit within the plant and tiering in stockrooms. This view also illustrates the ease and low cost of tiering along with maximum utilization of headroom and good housekeeping. The pallet loads are also used as inventory units, thus reducing cost of sorting, checking and taking inventories.

Until the first of this year, the operation of fork trucks has been limited to the main floors in several of our buildings because the floor construction would not permit the weight of the larger trucks and load. New trucks are available, 2½ feet wide by 4 feet long, that can

handle loads up to 2000 pounds, and are light enough to operate on upper floors. Fig. 6 is a typical view of an upper floor stockroom showing castings and miscellaneous materials tiered on pallets by a small fork truck. The pallet loads of materials are moved on and off the elevators at the various floors on 4-wheel platforms which eliminate the necessity of having the trucks or trailers ride up and down the elevators with the loads.

In any manufacturing business, emergencies continually arise. Fig. 7 illustrates the solution to one such emergency problem. The warehouse in this plant was completely filled. To avoid rental of additional warehouse space, the finished apparatus was placed on pallets, protected with waterproof paper and stored outdoors.

We have purchased approximately 100 fork trucks during the last three and one-half years, ranging from 1000 to 10,000 pounds capacity. They have already more than paid for themselves in reported savings and we have only scratched the surface on their future usefulness.

Close observation of these trucks in our plants has shown that the advantage of the new methods from a cost reduction standpoint are: Reduces unloading costs; reduces the time element of handling; unit loads can be shipped safely in cars without bulkheads and bracing; there is less damage to the material in transportation; there is less damage to cartons and material in storage; savings may be found in the use of pallet loads as a storage and inventory unit to reduce the cost

Fig. 6—Practically any shape of article can be handled effectively by this method as is illustrated by the variety stored on pallets at left. At right, Fig. 7, the system is shown adapted to outdoor storage to supplement indoor storage during peak production periods

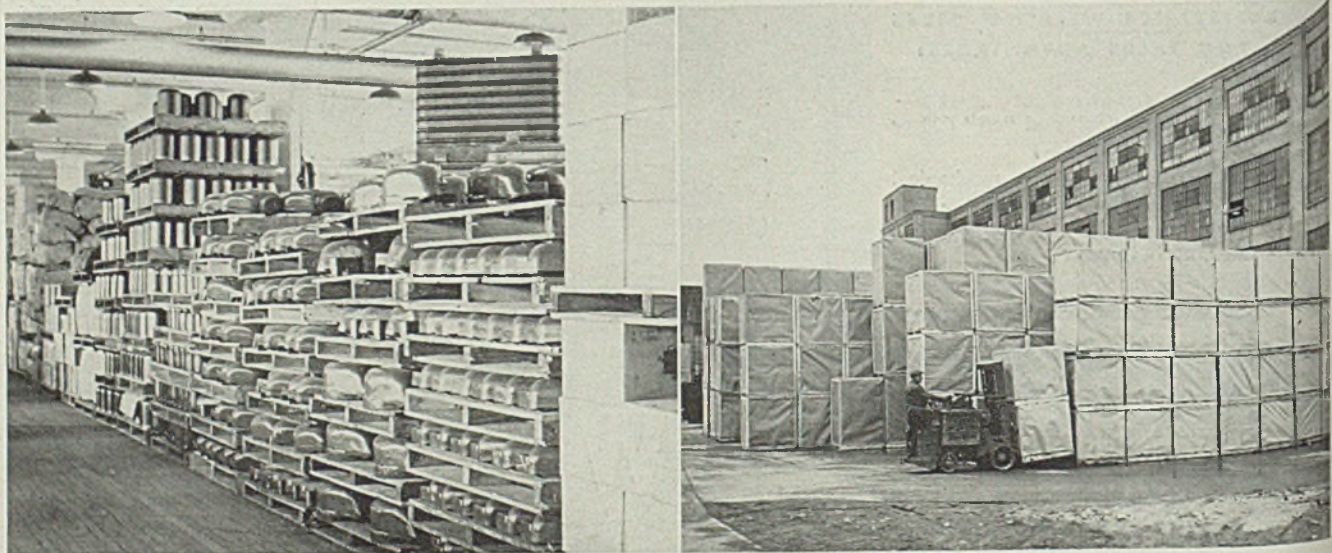
of sorting, checking, inspecting and taking inventories; stocking materials on pallets with the aid of tiering forks has the advantage of being extremely inexpensive and furthermore stock can be piled higher and neater with consequent saving in floor space and improved safety conditions; again referring to the time element, the trucks are a benefit in manufacturing operations as they not only serve as labor saving apparatus but also as production aid apparatus.

With the increased size of loading which the fork truck system permits, question has arisen as to the safety factor. However, experience has shown that handling pallets on fork trucks is much safer than hand stacking. There has been no trouble or accidents from material falling off pallets, even such unusual shapes as those in Figs. 5 and 6.

One precaution that has been found necessary is in loading and unloading box cars. When handling heavy pallets on fork trucks was first attempted, the drive wheels of the truck went through the floor boards of the freight car. The truck was removed from this first car and driven into another car containing lighter unit loads of steel. Again the truck went through the bottom of the car. Then someone suggested placing a steel plate, 4 feet square, on the floor of the car to distribute the weight of the truck over a greater area. This effectively solved the problem, and this particular truck paid for itself in less than six months.

The procedure in establishing unit-load shipments from suppliers and to assembly plants is to collaborate with a representative of a steel strapping manufacturer to design a unit load that can be handled most effectively. For instance, in establishing unit-load shipments of frac

(Please turn to Page 82)



COAT OF TAR AND FEATHERS

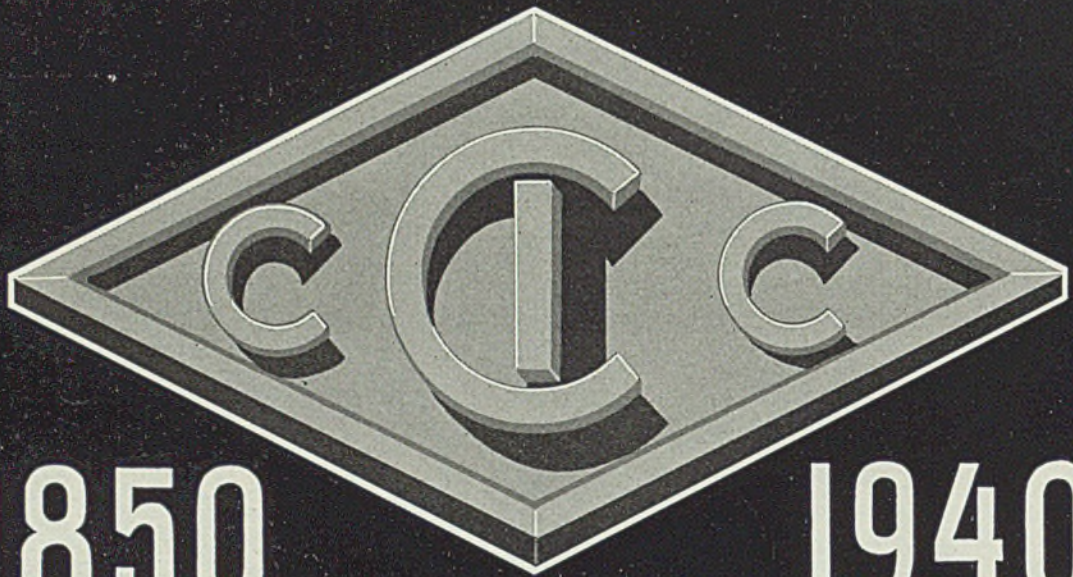


The origin of tar and feather coating might be found in American legal archives, but nowhere can be found any mention of its general utility. Surely no one who has ever worn a coat of tar and feathers would speak well of it. The garment is familiar to all Americans; indeed, it is handled almost exclusively by citizens of this Republic who take the law into their own hands. The ingredients are a couple of bags of feathers, a bucket of tar, a mob and a man who has offended the community. The offence might range from a capital crime to an individual belief in the inside track to Salvation. A coating of tar and feathers is thought by the mob to punish sin and correct erroneous belief.

Legal minds do not accept this theory, any more than practical engineering minds accept the theory that HOT-DIP GALVANIZING is short-lived. HANLON-GREGORY GALVANIZING COMPANY points out that HOT-DIP GALVANIZING is the ideal protection for outdoor steel construction. By this process, the zinc coating and the base metal become one—the ferrous metal acquires a coat that resists rust for years and years. It is expensive to resist corrosion by ordinary means—and even then rust finally appears. The safest course to follow in the protection of ferrous metals is to GALVANIZE—and you couldn't find a safer, more reliable company to do it for you than Hanlon-Gregory—HOT DIP GALVANIZING EXPERTS.



HANLON-GREGORY GALVANIZING CO.
PITTSBURGH PENNA.



1850

1940

Miners and Shippers of
Lake Superior Iron Ores



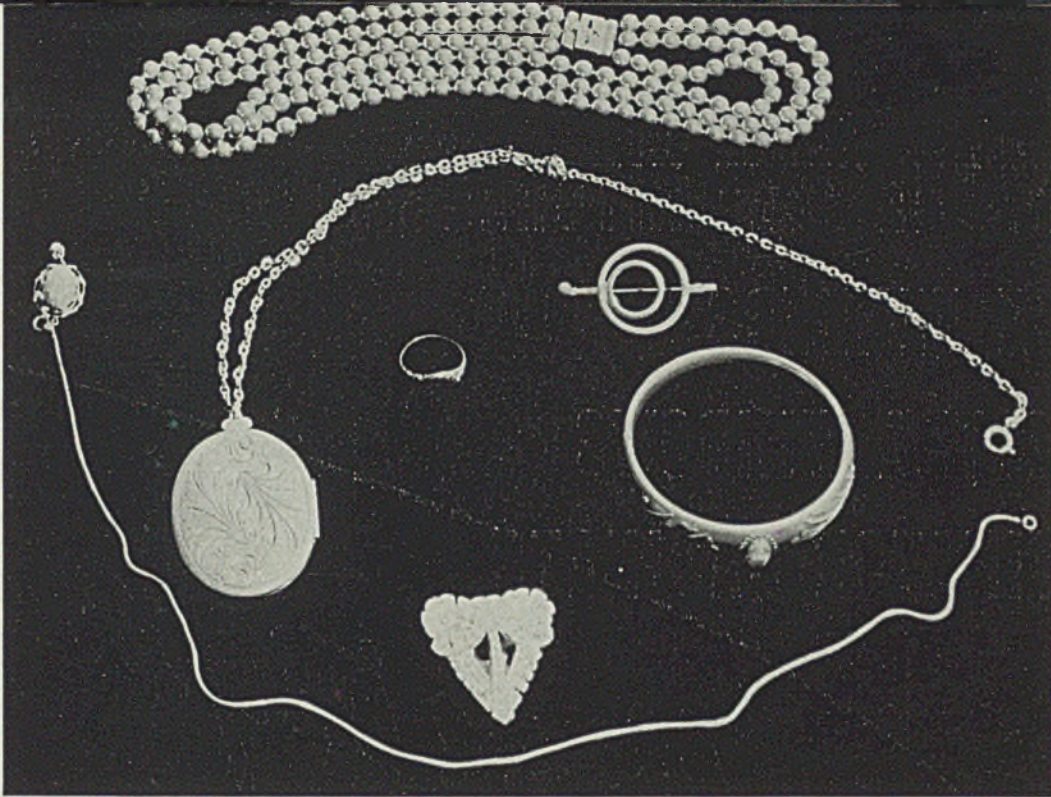
Vessel Transportation on
the Great Lakes



Coal for Industrial and
Domestic Use

THE CLEVELAND-CLIFFS IRON CO.

UNION COMMERCE BLDG. - CLEVELAND, OHIO



While a large portion of work to be gold plated is jewelry, there are many other applications for this finish

The Art of Gold Plating

Successful deposition of gold plate hinges on proper preparation of the surface. Coatings seldom exceed 0.00075-inch, usually require 30 minutes at 2 volts, 10 amperes per square foot of surface

■ OF ALL THE metals with which mother nature has so generously favored us, none is as durable as gold for this metal does not tarnish readily and successfully resists the action of all alkalis and all acids with the exception of a combination of muriatic and hydrochloric. Further, gold has a pleasing luster and is ranked among the most expensive of metals. Thus, when the art of electroplating was perfected over a century ago, it was logical for the early investigators to experiment with gold plating by which means a base metal could be made to resemble pure gold. This art was soon brought to perfection. Today gold plating is carried on extensively in all parts of the world and in this article is outlined the practice of the Ohio Plating & Mfg. Co., 224 High avenue, Cleveland. This company has been in business since 1868.

The first step in the process of gold plating is to prepare a smooth surface. Of course, this is a comparatively easy operation on new work. But if the article is to be refinished and is nicked or scratched deeply, it

By FRED B. JACOBS

is first polished with No. 180 emery, set up on a stitched muslin or felt wheel. These wheels are comparatively small, from 3 to 6 inches in diameter, and are run at a surface speed of about 5000 to 6000 feet per minute as in ordinary polishing practice.

However, in cases where the article is not dented or deeply scratched, the operation consists of buffing on a loose muslin wheel. The abrasive agent is tripoli applied to the wheel in cake form. After this operation, the work is buffed on a loose muslin wheel with cake white lime applied locally. As a rule these wheels are run somewhat faster than the polishing wheels previously mentioned. The additional surface speed is provided by using wheels of larger diameter, from 4 to 10 inches.

The work then is dipped in a solution composed of sodium metasilicate, sodium hydroxide and sodium cyanide. Next the work is dipped in

a 10 per cent muriatic acid bath which leaves it chemically clean. After the article is washed in cold water, it is wire brushed with a nickel silver rotary brush. This is followed by a cold-water rinse, dipping it in sodium and cyanide bath and another coldwater rinse.

Now the work is ready for plating. As a general rule, the plating tank holds about 50 gallons of solution composed of gold, sodium and cyanide. The anode is 22-carat fine gold, alloyed with copper. As a rule the anodes are small, about 4 inches long, 1 inch wide and 1/16-inch thick. As may be imagined, considerable capital can be invested in anodes, as one weighing 5 troy ounces is worth \$175 at the present-day price of \$35 a troy ounce. As a rule, the plate thickness seldom exceeds 0.00075-inch ($\frac{3}{4}$ -thousandth) although thicker coatings are the rule in some cases. It takes about a half hour to deposit a 0.00075-inch coat using 2 volts and a current density of about 10 amperes per square foot of surface to be plated. This is a general rule which, of course, is often modified in

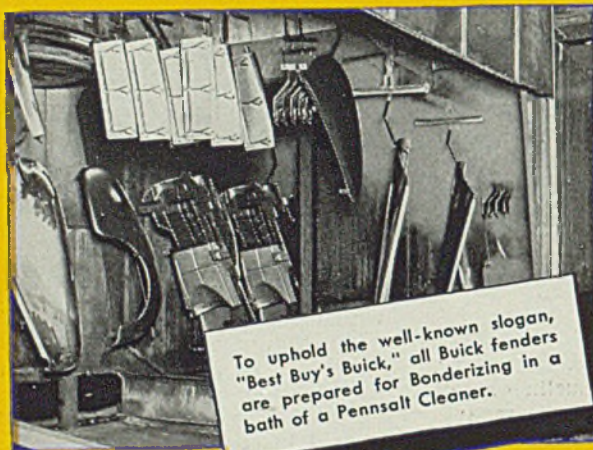
ACME THRIFTEE KITCHENS

BUICK FENDERS

FENESTRA WINDOWS

KELVINATOR CABINETS

all are prepared



To uphold the well-known slogan, "Best Buy's Buick," all Buick fenders are prepared for Bonderizing in a bath of a Pennsalt Cleaner.



Helping to account for the beautiful finish of this Kelvinator cabinet is the "sparkle"-free surface given to the metal by a Pennsalt Cleaner before the unit was Bonderized.



Here is an Acme Thriftee Kitchen for the moderate-priced home. Cabinets of finest furniture steel are washed under hard-pressure spray with a Pennsalt Cleaner, then Bonderized.



Contributing to the appearance and durability of the Fenestra Steel Casements in this house is the efficient metal cleaning done by a Pennsalt Cleaner prior to Bonderizing.


for Bonderizing by **PENNSALT** Cleaners

THESE four famous products, all conspicuous in use, must have both beauty and durability of finish. The cleaning operation, before Bonderizing, must provide the smooth, satin surface upon which the final finish can be built. It is no coincidence that these four famous products put the all-important metal-preparing job up to Pennsalt Cleaners.

Their solvent and emulsifying action, lasting power and fast cleaning ability are well known in many industries, which report not only a cleaning job

superbly done but at great savings of money. Starting with Orthosil as our original heavy-duty cleaner, we have developed a whole family of cleaners that meet, with laboratory precision, just about every industrial need.

One or another of our Pennsalt Cleaners is likely to fit into your processes with efficiency and economy. Would you care to make a test? Our technical staff is ready to give full information and assistance. Write to Pennsalt Cleaner Division, Pennsylvania Salt Manufacturing Company, Philadelphia, Pa. Address Dept. E.



Other Pennsylvania Salt chemical products used in large quantity by industry

- CHLORINE
- ANHYDROUS FERRIC CHLORIDE
- SAL AMMONIAC
- MINERAL ACIDS
- CAUSTIC SODA

PENNSALT **CLEANERS FOR INDUSTRY**

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

specific cases. Generally gold is an easy metal to deposit by electroplating inasmuch as it "throws" well. By "throwing" is meant that the plate deposits in depressions readily. Thus a concave reflector can be gold plated easily using a flat anode. With chromium plating, which is somewhat difficult, it often is necessary to use curved anodes to get the metal to "throw."

As the work comes from the plating tank it does not resemble the gold to which we are accustomed as the surface of the newly plated metal is a dirty brown. If a dull finish is desired such as seen on some kinds of work, sometimes called a matte finish, the article is wire brushed with a revolving nickel-silver wire brush. However, in the majority of cases the work is color buffed on a small canton flannel buff, 3 to 6 inches in diameter, with stick rouge as an abrasive. This brings out the beautiful gold luster to which we are accustomed.

An important branch of the gold plating business consists of plating ecclesiastical goods such as chalices, patens, altar vases, candlesticks, crosses, crucifixes, lecturns, etc. The time was when many of these articles were solid gold, but the present-day price of gold dictates that plated articles must be used. Of

course, there are no end of churches where solid gold articles are used. The majority of new ecclesiastical goods on the market today are base metal, gold plated.

Among other gold-plated articles in common use can be mentioned trophy cups of various kinds, lamps, tea sets, candlesticks, flat wire, such as trays, etc., and various articles of jewelry. Speaking of jewelry, there is quite a run of plating yellow gold plate on white gold articles that were in vogue some years ago as the yellow gold has come back into the market strongly.

There are also a number of important commercial uses for gold-plated articles of various kinds. For example, it has been found through experimentation that gold-plated reflectors are highly efficient for use with the comparatively new infrared electric lights employed in drying lacquer, etc.

A novel plating job recently done at the plant under discussion consisted of gold plating the inside surfaces of brass tubing about 4 feet long and from $\frac{3}{4}$ to $1\frac{1}{2}$ inches in diameter. These tubes are used for conveying oil from cotton-seed presses. It has been found that the gold-plated surfaces do not corrode and eliminate objectionable fumes that formerly were present in the

extracting process. The methods followed in plating the interior surfaces of the tubes are of more than usual interest. Both ends of the tube are corked with a 1/16-inch diameter gold wire running through the corks so the anode is located in the center of the tube. The tube is filled with the plating solution and thus forms its own plating tank. The results are highly satisfactory.

Many other novel gold-plating jobs could be cited. For example, the Ohio company gold plated the bumpers, on an automobile purchased by the Shah of Persia when he visited the United States some years ago. Also the company gold plated all the trim on an automobile used at the reception of Colonel Lindbergh when he returned to the United States in triumph after his solo flight across the Atlantic ocean from the United States to France several years ago.

Thus while the average gold plating department in the small shop may employ only a few men, the industry taken in the aggregate is highly important. The plating department in jewelry and flat and hollow ware manufacturing plants is also another highly specialized branch of artistic work where gold plating is used frequently in large volume, especially on interiors of tea sets and various other hollow ware.

New Hobart Foundry Has Monthly Capacity of 50,000 Finished Parts

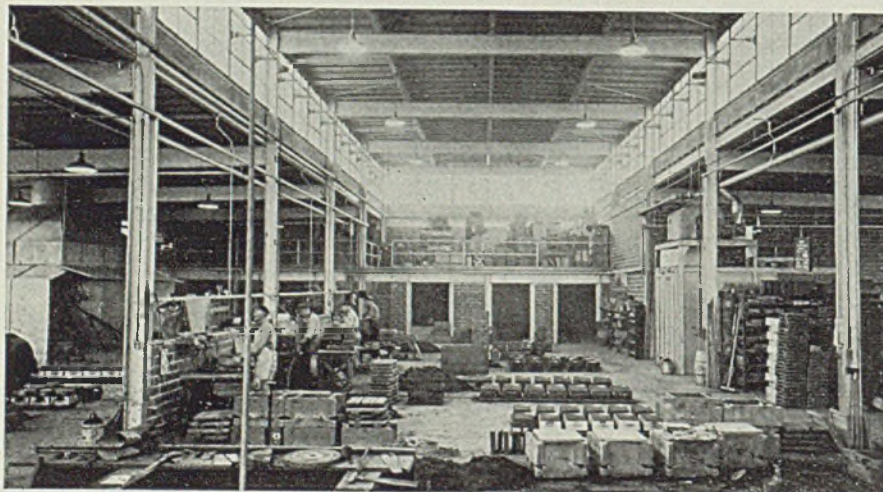
■ CASTINGS produced in the new nonferrous foundry recently placed in operation at the Troy, O., plant of Hobart Mfg. Co. range in size from small aluminum latch parts that weigh one ounce to main frames that weigh 14 pounds. Designed and built by Austin Co., 16112 Euclid avenue, Cleveland, this new unit is clean and airy, providing logical surroundings for the

manufacture of parts for food preparing equipment. It has a capacity of 50,000 pounds of finished parts per month.

The one-story monitor-type building features continuous steel windows 10 feet high. These extend completely around the east, north and west sides to give maximum daylight illumination. The south end is walled off providing a space for

a tinning plant. The west side is devoted to aluminum work—east side to brass. To prevent contamination of metal of either department by that of the other, a brick wall was built to separate the two. This wall, 50 feet long, is only 4 feet high—high enough to prevent the interspersing of metal—not high enough to interfere with even distribution of light. The cleaning department, office, and a cage for electric transformers, meters and other utility equipment are along the north wall. Along the south wall, adjoining the tinning plant, is ingot and sand storage space and a toilet room. The only connection between the tinning plant and foundry is through this room, which serves both departments. There is approximately 350 square feet of floor space in the ingot storage room. Since the building is fire-proof, storage space for pattern equipment is provided inside the foundry—on a mezzanine over the toilet room and the sand storage bins.

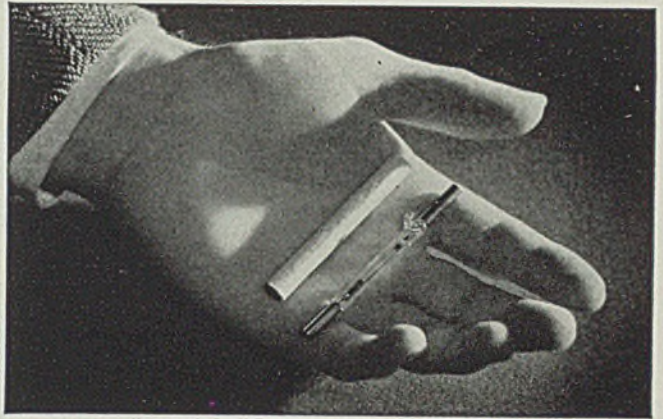
About 800 different active patterns are shelved according to index number.
(Please turn to Page 76)



At left is a view across the aluminum pouring floor of the new Hobart foundry. The brick wall, left center, separates the aluminum department from the brass department

No bigger than a cigarette

**1/5 AS BRILLIANT
AS THE SUN!**



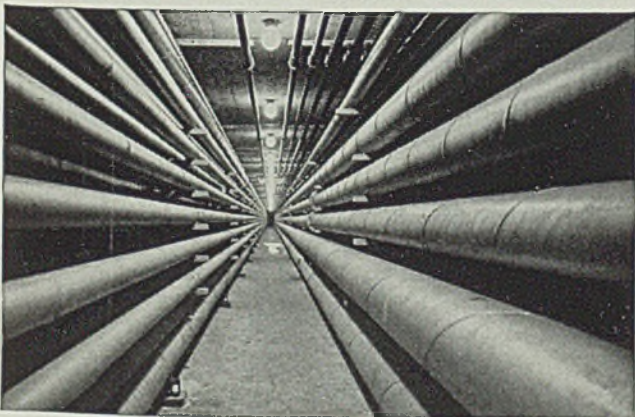
1 THE EARTH ITSELF IS A MIDGET compared to the sun. But this amazing new G-E "Midget Sun", 1/5 as bright as the sun's surface, is no bigger than a cigarette! A 1000-watt water-cooled mercury lamp, made of special quartz glass, it already has many practical uses, for instance . . .



2 ...IT HELPED BRING TELEVISION "out of the laboratory" by supplying higher levels of lighting, previously impracticable at close quarters, thus making televised images clearer. It is also used in photo-enlarging, engraving, and blue-printing. Is there a place in your business for this "Midget Sun"?



3 BETTER LIGHTING helps step-up increased production schedules. The Lees-Bradner Machine Tool Company in Cleveland gets 27 footcandles by using 500-watt G-E MAZDA C (filament) lamps in modern fixtures. Ask your G-E lamp man or your electric service company about better light for your plant.



4 STARTING WITH THOMAS A. EDISON, General Electric research has constantly been finding ways to make G-E MAZDA lamps give more light for current consumed. Use of argon gas (carried in pipes above) was a great forward step. Other improvements have increased lamp efficiency nearly 50% since 1921 . . . another reason for buying G-E MAZDA lamps!

G-E MAZDA LAMPS

GENERAL  ELECTRIC

Year by year, better lamps for every purpose

HOW TO GET THE KIND OF LIGHTING YOU NEED . . . EASILY AND ECONOMICALLY!

Although you may never have occasion to use the G-E "Midget Sun" described above, General Electric makes many other kinds and types of lamps to give your business better light for better seeing at lower cost than was ever before possible.

Different kinds of work require different types of lighting and varying amounts of light. Your G-E lamp man or your electric service company can show you how to get the lighting you need . . . easily and economically with G-E MAZDA lamps.

For helpful information on how better lighting can improve your business, write General Electric Company, Dept. 166 - S-J, Nela Park, Cleveland, Ohio.

The general offices of the Borg and Beck Division of Borg-Warner Corporation in Chicago are well lighted with 76 fixtures each containing four 40-watt G-E MAZDA day-light fluorescent lamps. Illumination on the desks is 35 footcandles.





Welding Tubes

To improve quality of welded tubes, new processing line employs fixed precision forming rolls and drives each roll spindle. Good tubes produced consistently down to 1/4-inch outside diameter

■ THE INCREASING use of tubular shapes is accompanied by added emphasis on making the tube to suit consumer's specifications instead of designing the articles to suit the physical characteristics of available tubes. Making welded tubes of special analysis steel with the exact physical characteristics desired means the welding equipment must operate uniformly and control all factors precisely if high quality work is to be done consistently.

There are a number of principles common to the making of all welded tubes—whether the material be low or high carbon, alloy or stainless steel. Of course, the first essential is that the material be weldable. Already many of the newer alloys have been checked for their resistance welding characteristics and have been found quite suitable.

Next, there are a number of operating factors that must receive due consideration in welding the tube. First of these and possibly

By GEORGE KENTIS JR.

The Yoder Co.
Cleveland

one of the most important is proper forming. Extremely close control of the forming operations is a prime essential as it largely determines whether or not a satisfactory weld will be made consistently. Machines such as that in Fig. 1, make resistance welded tubes in the range from 1/4 to 26 inches in diameter and obtain closer control of the cold forming operation by eliminating the older type of adjusting spindle which provided for vertical alignment of top and bottom rolls with one another and also alignment for each complete pass of rolls with the others.

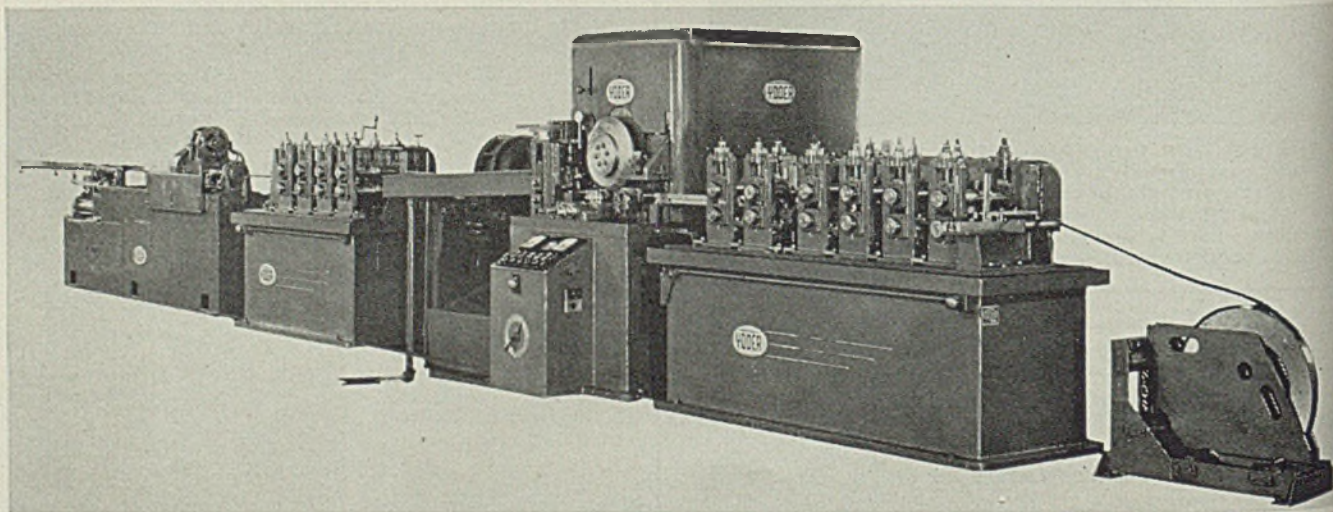
Present accuracy of roll grinding and modern precision bearings eliminate the need for a number of

these adjustments, thus simplifying the setup, reducing setup time and increasing production. The machine shown employs antifriction bearing mounted spindles precisely ground from location on an accurately ground thrust-bearing shaft shoulder. Roll alignment is assured without any intermediate adjustment. A permanent accuracy within 0.001-inch is easily obtained.

To change rolls with this arrangement, it is only necessary to slide accurately ground-to-length contour rolls and spacers onto a spindle supported between two rigidly mounted bearings. The entire assembly then is locked in place by a shaft end nut. It has been found that this method often reduces roll setup time to one fourth that previously required.

Proportioning of forming operations must be done carefully to distribute the forming work uniformly through the series of forming rolls. For best forming, it is essential that each forming roll spindle be power driven. Otherwise, the en-

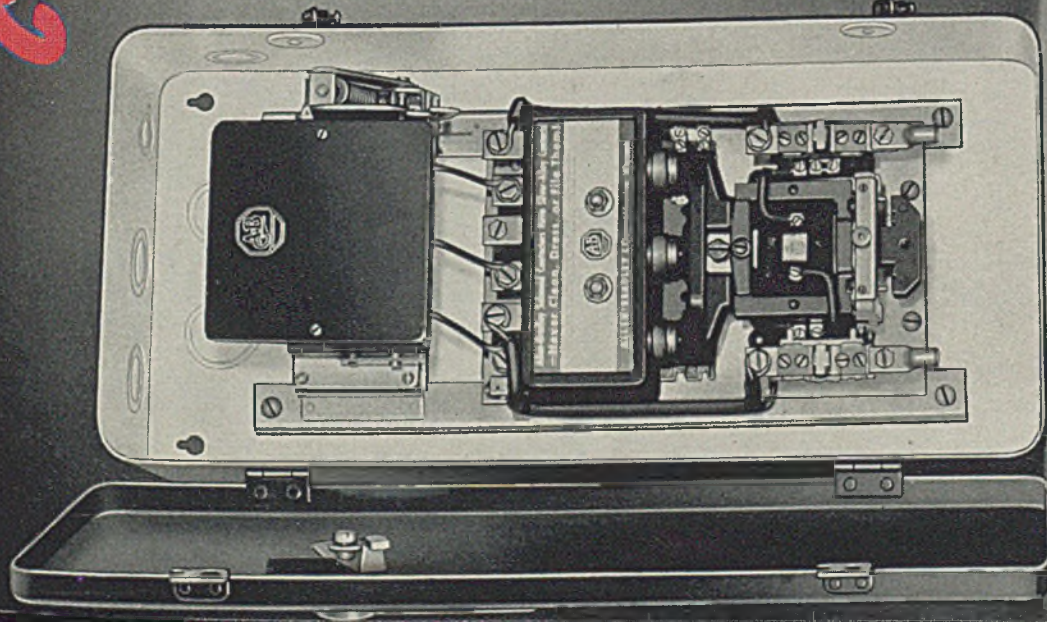
Fig. 1—Machines such as this make satisfactory welded tubes consistently in sizes from 1/4 to 26 inches in diameter



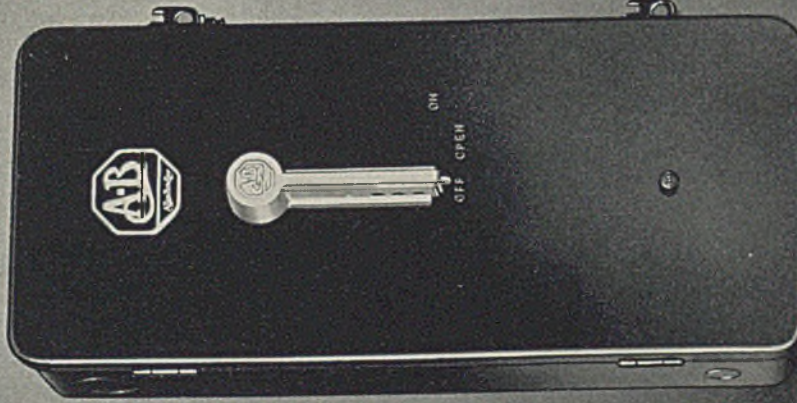
COMBINATION STARTERS

Designed for TROUBLE-FREE Service

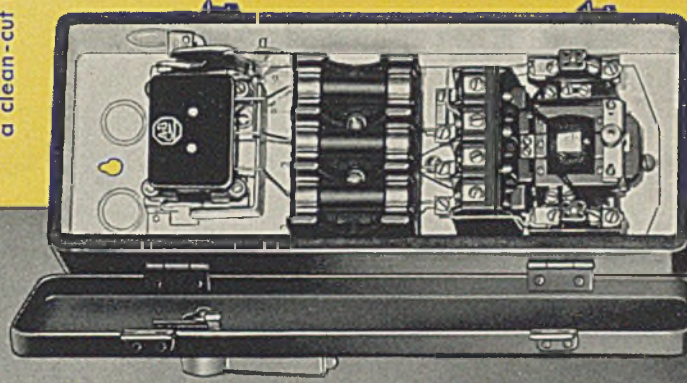
BULLETIN 712 Combination Starters—comprising a disconnect switch and automatic starter in one cabinet—have been redesigned for even greater sales appeal. The disconnect switch lever on the front of the cabinet presents a clean-cut modern appearance, and the more compact disconnect switch provides additional wiring room. Nothing has been taken from the reliability of the former construction.



Size 3—Maximum polyphase rating: 30 hp, 220 v.; 50 hp, 440-550 v.



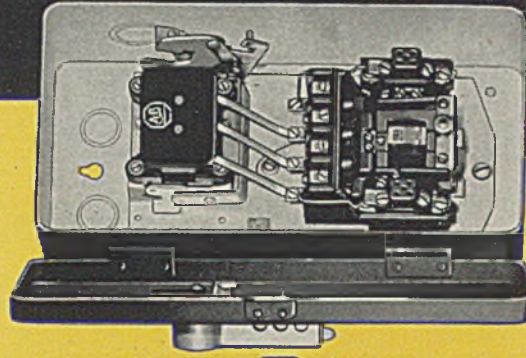
Size 2—Maximum polyphase rating: 15 hp, 220 v.; 25 hp, 440-550 v.



Size 1—Equipped with fuse clips. The felt gasket seal used with Type 1A enclosure effectively keeps out dust.



Size 1—Maximum polyphase rating: 5 hp, 220 v.; 7½ hp, 440-550 v.



Size 0—Maximum polyphase rating: 1½ hp, 110 v.; 2 hp, 220-440-550 v.



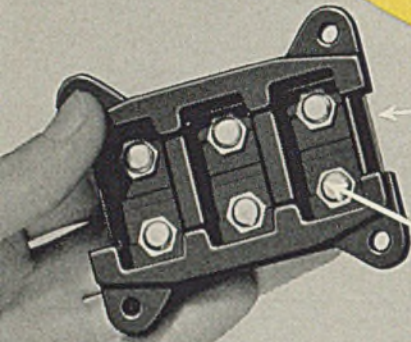
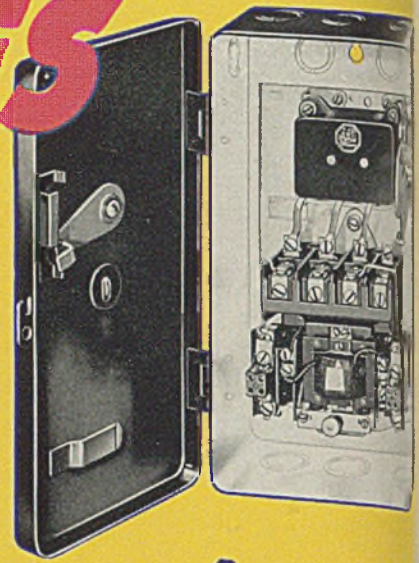
ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

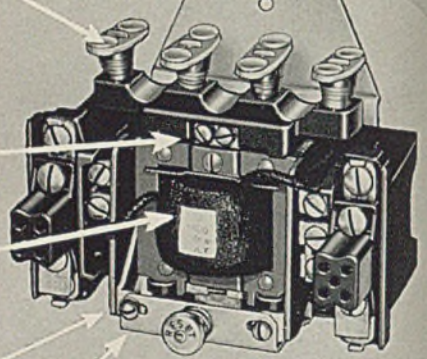
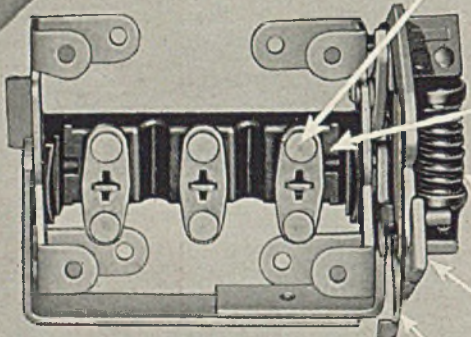
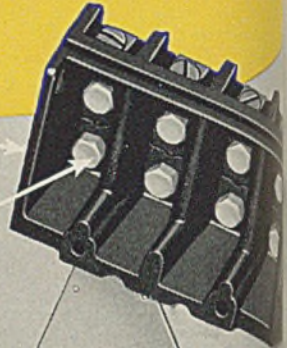
6 FEATURES

that mean long life

in  **COMBINATION STARTERS**



- 1—Enclosed Arc Hood**
Arcs cannot jump outside the arc hood. The combination of arc faced and double-break contacts instantly snuffs the arc. Either of these switches will interrupt at least ten times the maximum horsepower rating of the starter.
- 2—Double-Break Patented Cadmium Silver Contacts**
Contacts will carry current continuously without overheating. They require no cleaning or filing whatever and are always in perfect operating condition.
- 3—Straight-Line Motion**
Contact rebound, the main cause of arcing, burning, and welding, is practically eliminated in these switches.
- 4—Rapid Action**
Disconnect and solenoid mechanisms have a quick make-and-break action that greatly reduces contact heating.
- 5—Simple Mechanism**
No other starter has so few moving and, hence, wearing parts. This is your guarantee of freedom from trouble.
- 6—Compact Mechanism**
The extreme compactness of both magnetic starter and disconnect switch makes possible a very small enclosing cabinet with generous wiring space.



DISCONNECT SWITCH

This new disconnect switch is mechanically operated from the front of the cabinet. Its contact construction is identical to that of the famous Allen-Bradley solenoid starter. The compact mechanism is rugged and trouble-free. The silver alloy contacts will not heat up, no matter how long they remain closed. Also, the current interrupting capacity of this new switch is in excess of ordinary knife-type switches.

SOLENOID STARTER

The second unit in the Bulletin 712 combination starter is the popular Allen-Bradley solenoid starter—proved by actual performance in thousands of plants.

Allen-Bradley Company
1320 S. Second St., Milwaukee, Wisconsin

Can Be Locked in its "OFF" Position by Three Separate Padlocks



Cabinet is locked and disconnect switch held in "Off" position with the same lock. Operating lever is so constructed that it can be easily locked in "Off" position by any of three separate padlocks.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

tire load of forming is taken on a few driven spindles, depending on the rigidity of the partially formed tube section to rotate the idling passes. While it is entirely possible to obtain satisfactory operation with idling passes, all forming rolls should be driven for a consistently good product. Also driving all roll spindles allows greater flexibility in the type of work that can be done and affords longer roll life as well as reducing drive maintenance. The most important factor, of course, is the closer control of forming operation which it provides.

Electrodes Must Fit Tubes

To weld tubing successfully, it is essential that the electrode fit the contour of the tube accurately. While it is quite possible to trim electrode faces to suit an inaccurately formed tube, it is almost impossible to be sure that an accurate fit is maintained during operation unless the tube form produced by the forming rolls is consistent.

Of course it is possible to set the forming rolls to produce an odd-shaped tube from apparently single radii finish forming rolls. However, it is extremely difficult to produce this same odd shape consistently. Variables such as strip hardness and gage will upset this condition and make adjustment back to the original odd shape a tedious and difficult task.

For simplicity, the single radius circular segment is an ideal shape for the electrode face. It allows mounting a simple single radius turning tool directly adjacent to the electrodes where it may be moved in quickly when trimming is required. Also this affords use of a tube shaped to a circular cross section with close tolerances. This is most beneficial generally because this form is easiest to produce and control precisely.

With accurately formed tube and electrodes, the amount of electrode contact can be predetermined as a definite area and current of a proper value transmitted. Improper forming also reduces efficiency by causing current losses and scrap losses as well as the number of failures in processing and service. Fig. 2 shows some results of improper design of forming rolls on electrode contact. In Fig. 2a, forming a tube

with too large a radius at the top near the seam results in main pressure of electrodes and actual electrode contact at shaded area d, which may be only one half the electrode face.

Attempting to overcome this condition by pressing electrodes down onto the tube only tends to curl the edges in toward the center, thereby pulling the area at point e away from the electrodes at the time of heating. Resultant pitting adjacent to the weld and unsteady current transmission at the weld point itself will result in fairly good weld at some places with unsatisfactory welds at others. A consistently good weld will be extremely difficult to obtain.

Fig. 2b indicates the results of forming a pear or oval tube with the long dimension vertical. Here the electrode pressure and current-carrying area are directly adjacent to the weld at shaded area e and tend to push the two edges of the strip to be welded away from each other when passing the weld point. The undesirable results are the same as experienced with the form in Fig. 3a.

Fig. 2c shows the ideal condition

for proper control of weld and for consistent production results. Welder and forming rolls used on the mill in Fig. 1 closely approach this ideal as evidenced by consistently good welds and long electrode life. Good results are obtained on tube sizes varying from 1/4-inch outside diameter with 0.020-inch wall to 6-inch diameter with 0.375-inch wall and in all standard pipe sizes from 1/2 to 3 inches.

That the type of material if it is weldable does not effect a change in this principle was shown by a series of tests using four types of strip varying in hardness and analysis. These tests were further substantiated by comparing results obtained with 0.10 and 0.65 per cent carbon material without changing roll or electrode settings. The lower carbon material, being much softer, formed to the desired contour and tolerance much easier than the high carbon and so gave a more easily controlled shape. By placing additional forming passes on the mill, more permanent setting of the 0.65 per cent carbon strip was possible. This then produced a tube shape of good tolerance and uniformity with the result that

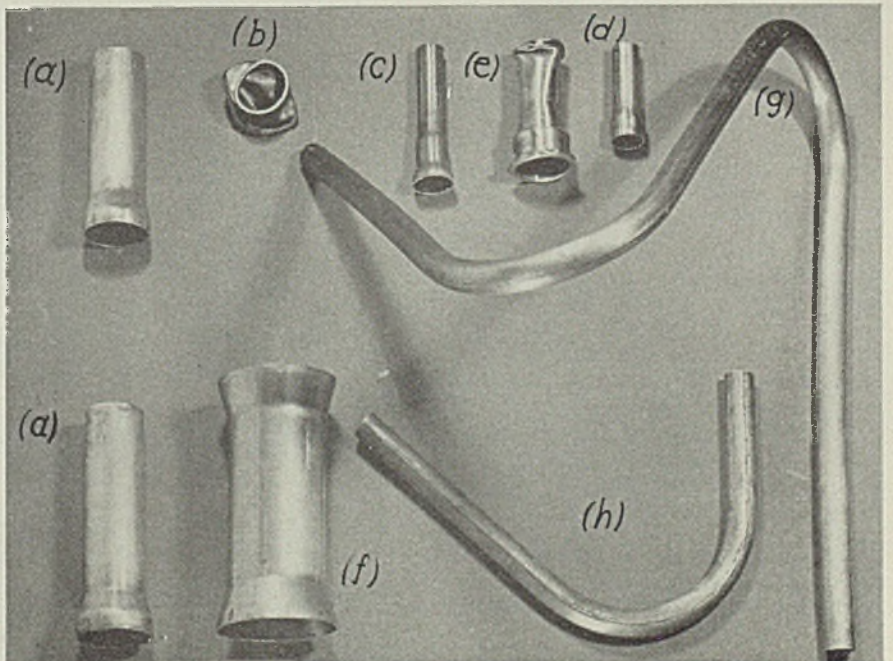
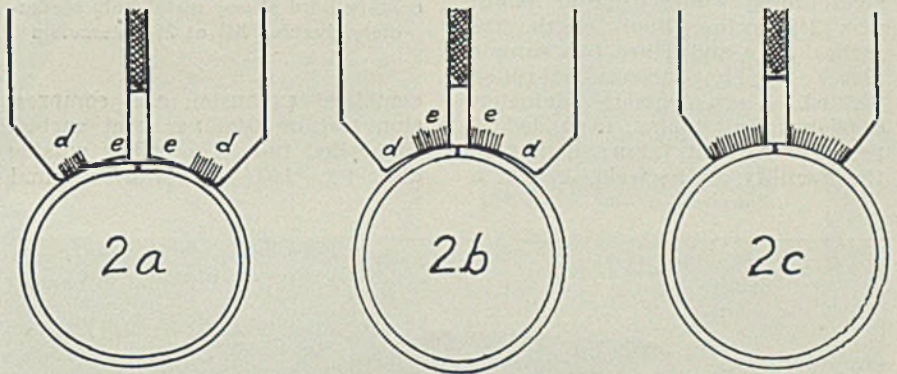


Fig. 2—Here 2a shows result of forming a tube with too large a radius at the top. 2b has too large a radius at the sides. 2c shows ideal condition

Fig. 3—Test specimens made from random selections of actual production runs show excellent quality and ductility of the welded tube

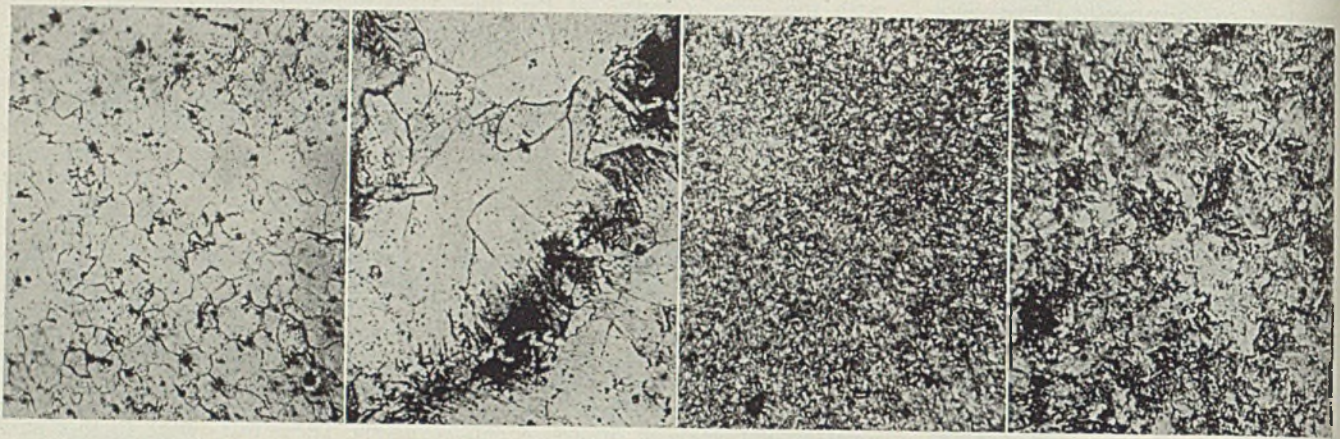


Fig. 4—Here 4a is SAE 1010 parent metal—typical fine-grained ferrite with a scattering of pearlite, dark spots appear to be inclusions from dirty steel. Material normally soft and ductile. At 4b is SAE 1010 weld metal—large-grained ferrite with bands and spots of martensite and nodular pearlite, coarse phases produced by water quenching. This is a strong, fairly ductile weld. Next is 4c—0.65 per cent carbon weld metal, a fine-grained structure with ferrite and nodular pearlite. Ductility equivalent to parent metal shown at right, 4d. This, 4d, shows ferrite and dark areas of fine pearlite, a fairly hard strong metal only moderately ductile. All at 250 diameters

stronger welds and a consistently better product than under the first set of conditions were thereby obtained.

To indicate results on actual production runs, a number of test specimens were picked at random. See Fig. 3. Here a and a are two samples of 2-inch diameter, 0.109-inch wall cold-rolled steel tubing given a 25 per cent expansion test. This material was SAE 1020. Here b is a compression test on a 2-inch diameter 0.093-inch wall, cold-rolled steel tubing whose original length was 2½ inches, final length, 1½ inches. At c and d are two sample pieces of low-carbon hot-rolled pickled, 1-inch outside diameter, 0.065-inch wall tubing, expanded 50 per cent without failure indicating the ductility of the weld. At e is a

combined expansion and compression test on 0.20 per cent carbon cold-rolled tube, 1½ inches outside diameter, 0.037-inch wall, original

length 7 inches and final length 4¾ inches.

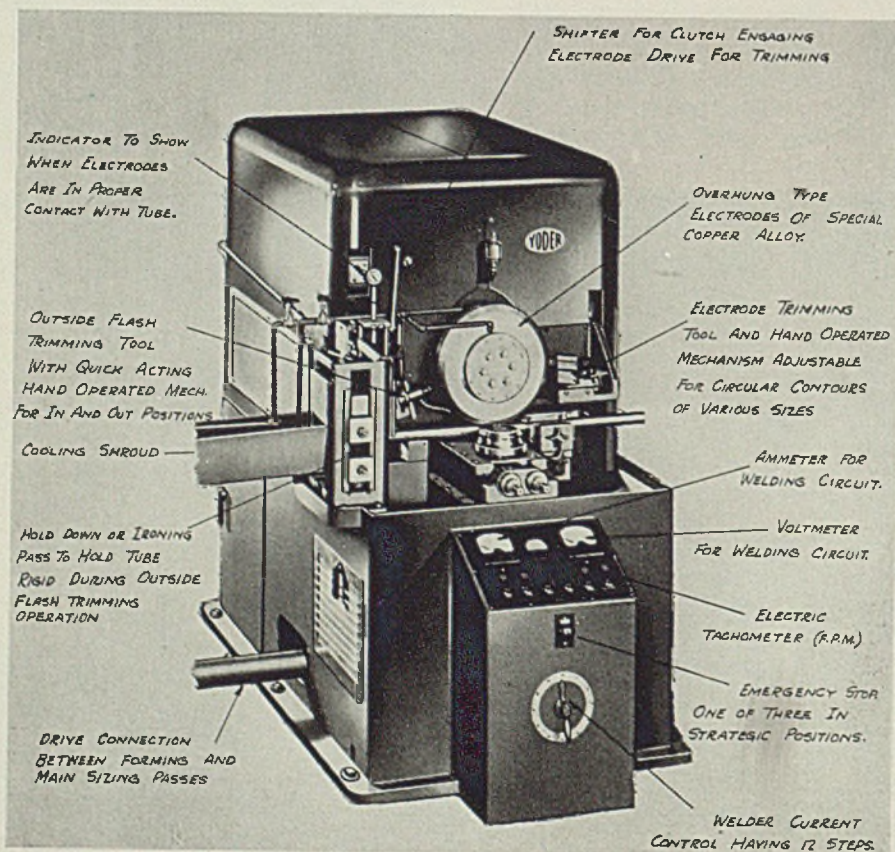
At f, Fig. 3, is a 25 per cent expansion test on a 3-inch diameter, 0.20 per cent carbon, cold-rolled steel tube with an 0.078-inch wall. At g is a multiple bend test on ¾-inch standard hot-rolled pickled strip tubing. Material was 0.70 per cent carbon reroll rail stock. Bends of 3-inch radius with weld on outside and 90 degrees off bend plane are illustrated.

Fig. 4 shows micrographs comparing weld characteristics. Fig. 4a shows the parent metal of SAE 1010 strip tubing of standard pipe size. Note fine-grained ferrite with scattered pearlite throughout—giving a soft and ductile material. Fig. 4b indicates weld metal at the weld and shows results of rapid cooling or quenching with water after welding to produce large grain structure having bands of martensite running across. This structure, although not altogether as ductile as the parent material is of equal strength and can be expanded and bent to commercial radii without failure. Such a grain structure can be improved greatly if desired by controlling the coolant after welding. Grain structure of original size can be obtained, and in some cases even better. This depends on the condition of the strip before forming and on the analysis of the material.

Fig. 4c shows parent material of 0.64 per cent carbon. This is a typical reroll rail stock, hot-rolled and pickled but unannealed. Microstructure shown represents a normally tough and moderately ductile metal with ferrite and areas of fine pearlite.

Microstructure of the weld metal at the weld is shown in Fig. 4d. (Please turn to Page 77)

Fig. 5—Closeup of welder and controls which are centered in benchboard at front. This unit is part of the processing line shown in Fig. 1



Forgings for Defense

SAFETY! Whether in war or in peace, insurance of safety is paramount. For the protection of lives, whether it is the surgeon's scalpel, the window-washer's safety belt, or the anti-aircraft gun, drop forgings in the machine or mechanism are the surest guarantee of safety.

Drop forgings made on Chambersburg Hammers are accurate forgings, using less metal and requiring less machining. They are stronger than parts produced by other methods . . . and frequently cheaper.

This 3-inch anti-aircraft gun has 75 drop forgings in the gun itself and its recoil mechanism. The shell projectile is a forging weighing 13 lbs., and is fired to a height of six miles, at a rate of 25 to 30 shots a minute.



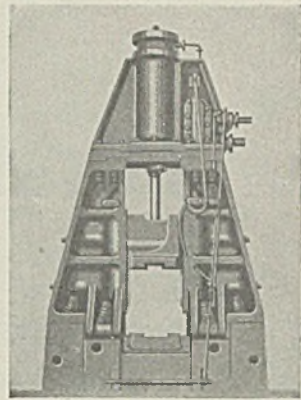
CHAMBERSBURG MODEL "E" STEAM DROP HAMMER

CHAMBERSBURG

HAMMERS • PRESSES

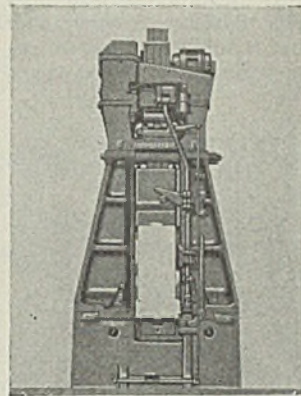
CECOSTAMPS

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.



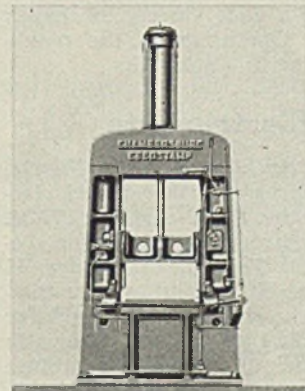
STEAM DROP HAMMERS

Standard of the industry. Greater production, greater steam or air economy, and greater accuracy. The Chambersburg patented Side Valve is featured.



BOARD DROP HAMMERS

Frame-to-anvil construction, front rod design, simplicity of motor drive, and increased board life characterize this efficient Board Drop Hammer.



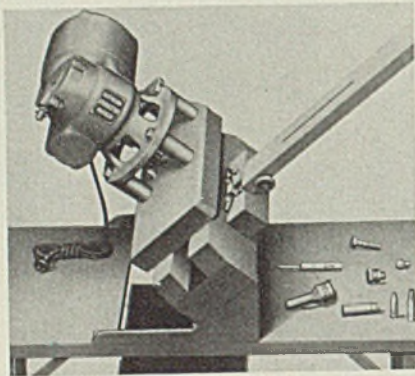
CECOSTAMP

Modern drop stamp for forming light weight, high strength sheet metal parts, and for small-quantity, short-run work.



Marking Machine

■ Quality Die Co., 9308 Baltimore avenue, Chicago, has introduced a Hoffmann production marker for high speed production marking of light or heavy formed metal parts. It is capable of marking 7000 pieces per hour without jamming by means of a specially designed rotary mechanism. The machine is driven by a geared motor, driving mechanism being fully enclosed. Enclosed gears



are greased through Alemite fittings. The marking die can take any number of lines and may accommodate insert types to permit changing numbers, serials, or insignia, and can be adapted to a wide variety of shapes and sizes. Operation of the marking machine is automatic.

Diesel Electric Sets

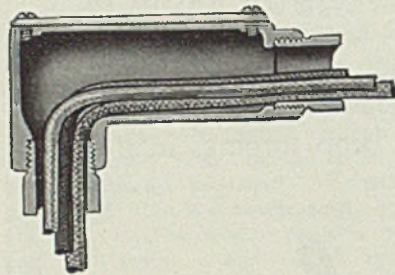
■ Caterpillar Tractor Co., Peoria, Ill., announces two new diesel electric sets, the 88-41 and the 77-34. Both are powered by 4-cylinder diesel engines. The 88-41 develops 41 kilowatts at 900 revolutions per minute, when equipped with radiator fan. The 77-34 develops 34 kilowatts at the same revolutions per minute when equipped with a fan. The sets as self-controlled. Inbuilt regulation enables them to pick up relatively large motor loads with a minimum of light flicker and voltage drop.

There are only three operating adjustments on the engines, and none of these involve the fuel system. The generators are direct-connected,

rotating field type, available as 3-phase or single-phase 60-cycle or 50-cycle with a wide variety of voltages.

Conduit Fittings

■ Adalet Mfg. Co., 1448 East Fortyninth street, Cleveland, has introduced conduit fittings, Form 37 Adalets, which embody a different principle of interior design. The cross-section illustration shows the smooth curves on the inside of one of these fittings, showing the elimination of turns that crack and cut insulation. The bell-mouth curve



prevents sharp kinks in wires or cables on all right angle turns. In addition this design speeds the job by making it easier to pull the wires through.

Carrying Case for Hand Grinders

■ Dumore Co., Racine, Wis., has developed a steel carrying case designed to keep hand grinders clean and to prevent hand grinding equipment from being misplaced. It measures 11 x 4½ x 3¼ inches and has a compartment for storing extra

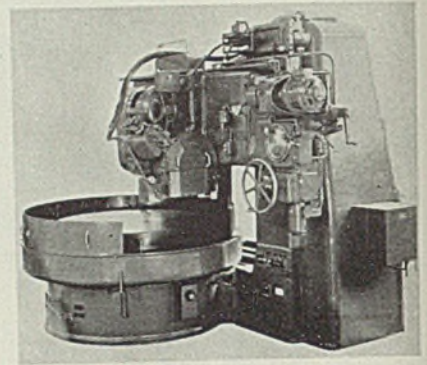


mounted grinding wheels, abrasive bands and arbors.

Surface Grinder

■ Hanchett Mfg. Co., Big Rapids, Mich., has announced a large rotary plane grinder which is driven by a 30-horsepower, 1200 revolutions per minute motor. Its grinding member is mounted on a cross rail between two columns. Provided with power elevation by 5-horsepower motors, this rail is automatically clamped

to both the main and auxiliary columns. Grinding wheel head incorporates hand and automatic down feed, and adjustable cross



feed with a range of speeds of from 3 to 9 inches per minute driven by a 4-speed ¼-horsepower motor. The ways on which the wheel head travels are tiltable to an angle of 5 degrees in either direction. The machine may be fitted with a straight wheel on a horizontal spindle, or a cylinder or segmental wheel on a vertical spindle. In any combination the wheel head can be hand or automatically fed in increments of from 0.0002 to 0.0003-inch. The 72 or 84-inch table is driven by a 15-horsepower motor through a variable speed unit, which gives a range of table speeds from 6 to 18 revolutions per minute. Clearance is provided to swing work up to 90 inches in diameter. The machine illustrated has a 24-inch diameter wheel with a 5-inch face.

Battery Tester

■ General Electric Co., Bridgeport, Conn., announces a new battery tester which compensates for variations in temperature and has positive contact locking-type battery clips. It is easy to operate, calibrations being produced on the dial to prevent error. Readings are obtained after the dial has been set to electrolyte temperature and rated battery capacity. Condition of the battery is shown in the dial section indicated by the knob pointer. Reliability is provided by a precision voltmeter and by a calibrated fixed high-rate discharge resistance. A shelf is provided for the battery being tested.

Pipe Cleaning Machine

■ Oster Mfg. Co., 2057 East Sixty-first street, Cleveland, announces a new electric sewer and pipe cleaning machine capable of removing stoppages several hundred feet from the pipe opening. It also is capable of passing through elbows and traps. Revolving different types and stiffnesses of coiled wire

"snakes" with various augers and cutting tools attached to them, the machine cuts through roots, rags, grease, chips, cinders and other obstructions. It is driven by a ½-horsepower reversible variable-speed motor which is hooked up to the spindle pulleys by V-belts. A split pulley on the motor can be adjusted to lighten the tension on the V-belts, allowing them to slip before the "snakes" become over-strained.

The gripping chuck which revolves the "snakes" eccentrically is mounted on the spindle. The case and base of the machine are of sheet steel and the machine is mounted on casters. Its overall length is 15 inches, width 15 inches and its height 14 inches.

Resistor

International Resistance Co., 401 North Broad street, Philadelphia, has introduced a complete line of noninductive IRC power wire wound resistors, from 10 to 200 watts and with any type of mounting. These utilize the Ayrton-Perry type of winding which assures full wattage ratings. All features of standard IRC resistors including the climate-proof coatings are included in the new units.

Tramrail Carrier

Cleveland Tramrail division, Cleveland Crane & Engineering Co., Wickliffe, O., has developed a new tilting box grab and tramrail carrier that picks boxes up, sets them down, or empties them by tilting, operations being manipulated by controllers in the cab. The equipment consists of a cab-operated motor-driven carrier with two independent hoisting units and motorized grab. The boxes used with the grab may be extended into or retracted from the suspension brackets by the operator in the cab. The suspension brackets make it possible to interlock the boxes. The unit is available in any size from three to five tons.

The carrier travels on arch beam rails at 300 feet per minute. Tote boxes, spool boxes and other containers may be handled with this equipment.

Pencil Compass

V. & E. Engineering Co., Pasadena, Calif., has introduced a VEECO bow pencil compass for use in industrial drafting rooms and shops. It is light in weight and is constructed of steel, except for the center screw thumb-piece and the handle, which are of dural. The center screw articulates with the legs by cylindrical nuts. The legs bear upon a double-grooved hinge pin of



To the Man With a Rust Problem

TO THE EXECUTIVE
TO THE PURCHASING AGENT
TO THE MAINTENANCE ENGINEER

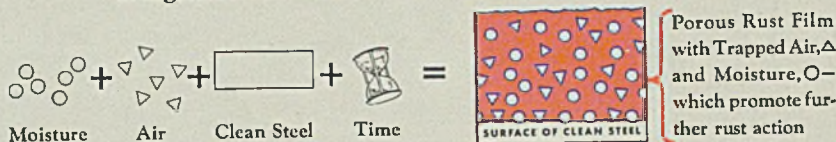
SUBJECT: Your Rust Problem

Gentlemen:

PENETROL stops further rust action on rusty steel—and you can paint over it. You don't have the trouble and expense of trying to remove all the rust.

Here is the problem and the answer:

Diagrammatic Illustration of the Rust Problem



Diagrammatic Illustration of the Answer to the Rust Problem



PENETROL is all we make. We can't cover the subject in this space. But we have a technical staff to study your specific rust problem and offer a solution. Send your problem in to us for their recommendations.

THE FLOOD COMPANY
6217 Carnegie Avenue
Cleveland, Ohio



broad base, insuring strength and alignment.

The compass measures 6½ inches in length and will describe circles up to 10 inches in diameter. When the pencil lead and shoulder point are replaced by the two points of hard alloy steel which are provided, the instrument becomes a divider.

Fluorescent Luminaire

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has introduced an open end twin-lamp fluorescent luminaire, utilizing 40-watt, 48-inch Mazda type F white or day-

light fluorescent lamps for general or supplementary lighting of low bay industrial areas. Available only in the spread distribution style, this FPR unit is for operation on 125, 199-216 and 220-250 volts, 60 cycle alternating current.

Luminaire consists of a hood, reflector, lamp holders, starting device and ballast equipment. The hood is of sheet steel and carries the hinged porcelain enameled steel reflector. The lamp starter is self-contained in an aluminum housing which plugs into a socket located in the fixture hood. Two-lamp ballast with starting compensator is

used to provide the high power factor and to minimize cyclic flicker. The luminaire is arranged for rigid or flexible conduit, or chain suspension mounting.

Reversible Wrenches

■ Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, has introduced three new size reversible wrenches with bolt size capacity of ⅜-inch, ½-inch and ¾-inch respectively. These, the CP 344-R, CP 349-R and CP 360-R are particularly valuable where nuts are to be applied or removed. They employ a slow rotary motor which is simple in design.

The wrenches have no gears or resilient members in the driving unit. Their light weight and short overall lengths make them easy to handle.

Neoprene Suit

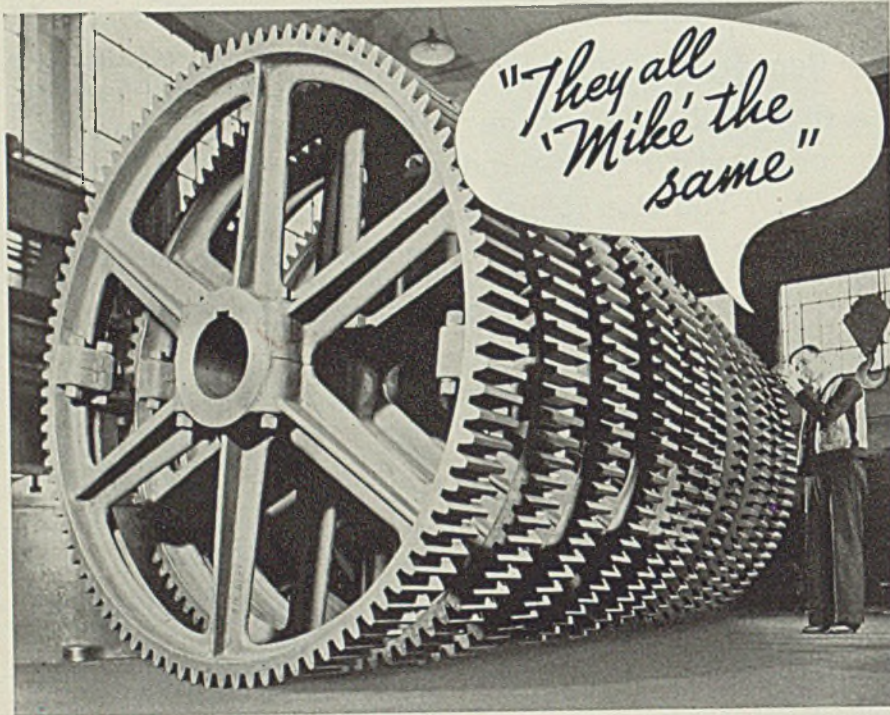
■ Industrial Products Co., 800 West Somerset street, Philadelphia, announces a Neoprene suit for use by handlers of oil, alkalis and acids. It is made in a 2-piece style with all seams vulcanized. The jacket



has square shoulders, low stand-up collar, ball and socket snap fasteners with protecting fly front. The trousers are of the bib type with adjustable suspenders of the same material.

Flash Welder

■ Federal Machine & Welder Co., Warren, O., has introduced a new F-4 flash welder which embodies features essential for high production. It is built with flat top platens on which may be mounted various types of clamping fixtures to accommodate many varieties of welding jobs. Parallel keyways provided on these platens assure accurate alignment of the clamping fixture which is bolted on the platen sur-



960 GEAR TEETH . . . ALL ALIKE

☆ The tooth vernier on the finished product tells the story of exceptional accuracy . . . one pattern . . . ten large gears . . . nine hundred and sixty teeth . . . each one exactly like the other. ☆ Whether it's a spur gear or some other type . . . there's a Horsburgh & Scott standardized gear for the job . . . accurate . . . husky . . . built to endure. Unceasing vigilance in the selection of materials and painstaking care in design and manufacture make H & S Gears the finest in the world. You'll find proof in their trial.

Your Company Letterhead Brings a Complete 448-Page Catalog

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

faces. The flash chute is designed so it may be readily cleaned. It seals in the flash and prevents it from getting down into the transformer which is mounted in the frame below.

The entire drive arrangement which is mounted on the moving platen end of the machine is enclosed. The drive mechanism is motor driven through a variable speed drive and a gear reducer unit to the cam which controls the flash and upset period of the weld. This cam also is covered over to protect the flash and dirt from building upon the face.

The machine is made in transformer capacities up to 150 kilovolt-amperes, suitable for welding stock up to one square inch welding area. It may be used for rounds, flats or formed sections.

Horizontal Miller

■ Van Norman Machine Tool Co., Springfield, Mass., has introduced a new No. 2-S horizontal miller available both in plain and universal types. It is designed for maximum metal-removing capacity. Eighteen spindle speeds from 25 to 1250 revolutions per minute are selected by a single lever, as are the 18 feeds which have directional controls both for front and rear. It also has a rapid traverse in all directions. The table measures 50 x 12 inches.

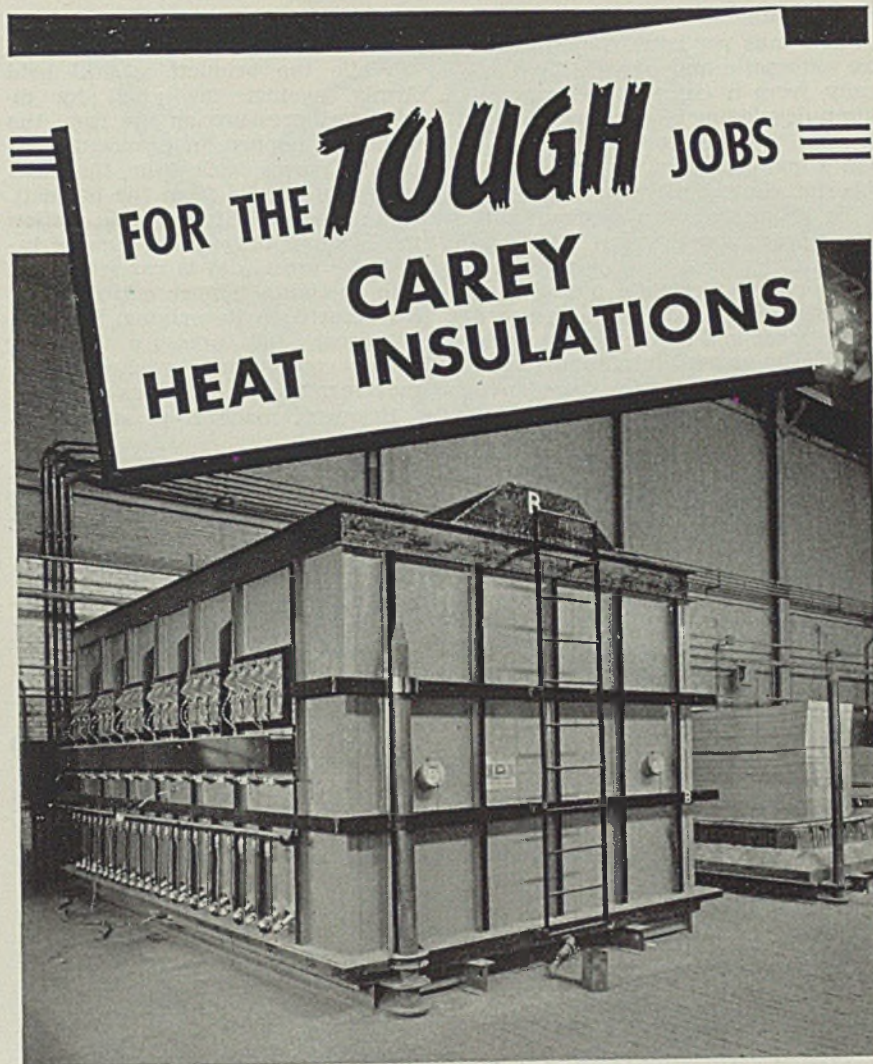
All-Speed Variable Speed Transmission

■ Standard Transmission Equipment Co., 416 West Eighth street, Los Angeles, announces a new all-speed V-belt variable speed transmission. It operates on the variable pulley principle, and consists of two interlocking pulleys mounted on a common shaft. The variable speed spindle can be pivoted laterally between the motor and the driven machine to provide new running diameters on the interlocking pulleys.

The selected speed is maintained by a lock nut on the control quadrant, and the oblique slot which automatically and positively guides the spindle at all times insures belt alignment. Special impregnated bronze bearings are used with forced lubrication provided at all times. The unit is available in three sizes for $\frac{3}{4}$ -inch A and B-belts and in speed ranges up to 12-1.

Briquetting Presses

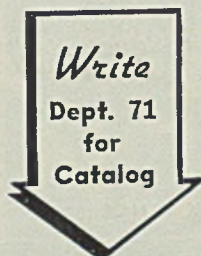
■ Milwaukee Foundry Equipment Co., 3238 West Pierce street, Milwaukee, has placed on the market a new line of hydraulic briquetting presses for briquetting of any type of metal borings or turnings. The



AT THE plant of the Otis Steel Company, Cleveland, steel sheets to be annealed are stacked on bases and covered with corrugated steel hoods. Gas furnaces are then swung over the hoods.

In these annealing operations, the bases are subjected to extreme heat and heavy loads. In previous experience, the bases broke down after 50 heats—had to be rebuilt. Since rebuilding with CAREY HI-TEMP and 85% MAGNESIA, the bases are as good as new after 50 heats.

The tougher the job, the more you need CAREY Insulations. Whatever your insulation problem, put it up to CAREY.



THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio

Dependable Products Since 1873

BRANCHES IN PRINCIPAL CITIES

INDUSTRIAL BUILDING PRODUCTS OF
ASPHALT — ASBESTOS — MAGNESIA

Roofing • Siding • Flooring • Insulations • Expansion Joint
Roof Coatings and Cements • Waterproofing Materials
Asbestos Paper and Millboard



line is available in capacities of $\frac{1}{4}$, 1 and 2 tons per hour. The presses are automatic and operate hydraulically from a constant delivery oil pump developing a pressure of 1500 pounds. At the start of the operation a magnetic feed, equipped with rheostat control, flows the material to be briquetted at a uniform rate into a receiving hopper. A large main piston propels the ramming tool forward forcing a quantity of the loose chips into a die attached to the front end of the hopper. The material is pressed into almost solid form against a massive fixed anvil by the continuing forward stroke of

the ram which develops a final pressure of 120 tons.

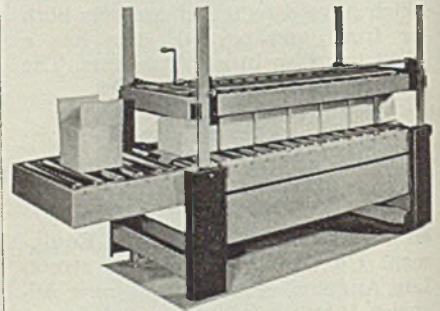
While the briquet is still held firmly against the anvil by diminished pressure on the ram, the receiving hopper, independently actuated, moves back from the anvil stripping the die from the briquet. Upon reversal of the ram motion the briquet drops into a chute below the press and is carried away. The receiving hopper carrying the die returns to its original position. Electrical and pressure actuated valves control and synchronize all movements of the various parts.

Briquetts made from steel turn-

ings will have a minimum density of approximately 70 per cent while those made from cast iron will have a density of at least 80 per cent. The presses come completely mounted on their own base. Where steel turnings are to be briquetted, cutting oils can be salvaged almost completely at the press by use of suitable drain pans and deflectors as the material is squeezed practically dry by the heavy pressures.

Hand Gluer

■ A-B-C Mfg. Co., Quincy, Ill., has introduced a hand gluer of 26-inch capacity for users of corrugated shipping containers. It is available in all lengths, starting with a standard 6-foot unit. The only operating adjustment on the entire machine is the vertical adjustment of the upper belt section which is controlled by a crank. Motion is transmitted by solid steel shafts through cut-steel worm-and-spur gears to racks cut in heavy steel uprights. The light-weight upper section can be easily and quickly adjusted to different container heights. The machines are mounted on 4-inch steel and ball-bearing casters for easy



movement from place to place. The upper belt runs over crowned wood pulleys mounted on ball-bearings. These end-pulleys are 4 inches in diameter. Ample adjustments are provided to take up belt stretch or to adjust belt travel. Power is supplied and speed reduction secured by Master geared-head motors. Metal parts are protected against rust by nickel plating or by paint. This hand gluer is guaranteed against defective materials and workmanship for 12 months.

Chaser Grinder

■ Geometric Tool Co., New Haven, Conn., announces a new No. 20 chaser grinder for resharpening of chasers—both on the chamfer and on the cutting face. It features a work table mounted directly on a plane ground surface. It may be manually fed both longitudinally and transversely. The spindle housing is pivotally mounted on a sad-

GLOBE

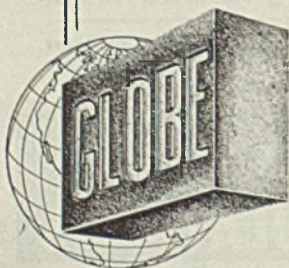
SUPERIOR LADLE BRICK

Recent additions to our plant have increased our annual capacity of "GLOBE" Superior Ladle Brick to 42,000,000 brick per year . . . to meet the demand made necessary because of years of fully satisfactory service to the steel industry.

"GLOBE" Superior Ladle Brick, either wire cut or dry pressed, will improve your metal . . . eliminate dirty steel . . . reduce lost time due to refractory replacement . . . and lower per ton brick costs.

Whether you need a few hundred or several thousand ladle brick, we can supply your requirements immediately.

May we have an opportunity to quote on your next order?



SERVING THE STEEL INDUSTRY SINCE 1873

The GLOBE Brick Co.

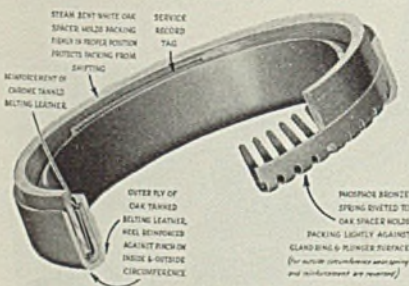
EAST LIVERPOOL, OHIO

dle equipped with three ground ways. The saddle may be adusted vertically by means of an elevating hand wheel and it can be securely locked in position against the ways by means of a binding knob. Final vertical adjustment of the grinding wheel is made by means of a small micrometer hand wheel. The weight of the driving motor in combination with the pivotal spindle mount prevents any backlash.

The spindle, itself, is equipped with a tapered bronze bearing at the front and a radial ball bearing at the rear. Adjustment for wear can be made by tightening an adjusting nut at the forward end of the spindle. Longitudinal table travel of the machine is 8 inches. A 1/3-horsepower single or poly-phase motor furnishes the power through a V-belt drive. The machine takes up 44 x 32 inches of floor space.

Plunger Packings

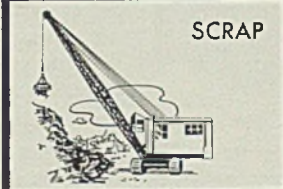
Wayne Davies Packings Inc., 325 West Huron street, Chicago, has introduced a new reinforced hydraulic U packing in section sizes from 1/2 to 3/4-inch inclusive, for any plunger diameter from 9 to 90 inches. Its wear wall and heel are doubly reinforced against wear on the contact leg and against pinch from excessive clearance between plunger and gland ring. It may be reinforced with any adaptable material over the U packing base. The standard reinforcement is tough chrome tanned belting leather backed by oak tanned belting stock. It is automatic in adjustment to any pressure, and a phosphor bronze



spring spacer maintains a light pressure against the inside of the bevelled contact lip. This spring spacer can be used through the service life of several packings. The white oak spacer is steam bent to the packing channel, forming the frame to which the spring is secured, and fits snugly against the outer lip or outer circumference of the U. The oak spacer extends beyond the packing lips and serves, by its contact with the end of the packing recess, to hold the U packing in position to seal at all times.



Stocking steel for Consumers Steel Co., Detroit, Michigan



NEEDS NO EXPENSIVE TRACKS OR OVERHEAD EQUIPMENT

UNLIKE a locomotive crane that is confined to tracks or an overhead crane whose travel is limited by its structure, the Northwest Crawler Crane goes anywhere.

Coal and ashes at the power plant, scrap from the machine shop, loading on the shipping platform, unloading at the receiving platform, piling in the store yard, repair work and upkeep about the plant are all in the day's work—all day—every day. It speeds up plant operation and does things that you probably couldn't get done before—and with the safety and economy of gasoline, Diesel or electric power—a size for every plant—4½ tons to 40 ton capacity.

NORTHWEST

THE CRANE THAT GOES ANYPLACE

NORTHWEST ENGINEERING CO.
1805 Steger Building, 28 East Jackson Boulevard
Chicago Illinois

Built in a range of 18 sizes — 4½ to 40 tons capacity

New Hobart Foundry

(Concluded from Page 62)

bars on portable-type metal shelving.

All types of patterns are used, including loose patterns, follow boards and match plates. The reason the foundry has to stock such an unusually wide range of different size slabs and boards is that it is called upon from time to time to make service parts for obsolete models—often models originally made by independent companies long since absorbed by Hobart. Yet there isn't enough of this parts business to warrant standardization now of either the patterns or the diversified methods of operation. The three sand bins under the mezzanine have a total capacity of between 150 and 175 tons. Most of the equipment in the foundry was installed new with the building. The core oven is a latest type recirculating unit with complete safety equipment. It is a 12-drawer double unit oven with a shelf capacity of 150 square feet. Fuel is natural gas of 1000 B.t.u. Automatic controls maintain constant temperatures, and an exhaust fan draws out fumes and smoke.

Located beyond the coremakers are three aluminum furnaces—two melting furnaces and a holding furnace for permanent mold production. The first two have capacity of 250 pounds each, the third a capacity of 320 pounds. Some 3000 pounds of metal easily can be melted here per day. Three brass melting furnaces equipped with 45-size crucibles are at the north end of the building. A cantilever hoist supported on an overhead I-beam is used for lifting the 135-pound capacity crucibles out of the furnaces into the pouring shank.

Smoke and fumes are removed by two 36-inch fans mounted in the wall just below a large hood. The furnace section is closed off on each side by hood-to-floor panels of sheet metal.

In line with best safety practices for transporting and handling sand and castings, the floor of the building provides plenty of room for these movements. Wide aisles separate departments and each is clearly marked on the floor with wide white lines.

Announces Revision of SAE Steel Specifications

International Nickel Co. Inc., 67 Wall street, New York, announces its revised data sheet section VII No. 1, "Society of Automotive Engineers Standard Specifications for Steels." This incorporates the latest additions and revisions in the SAE and ASTM steel specifications,

plus additional data on standard test specimens.

Carboloy Extends Drawing Die Line

■ Availability of standard Carboloy round hole dies for drawing sizes of bar and tubing up to 3½ inches diameter, and improvements in construction in the larger series—R-7 to R-16—of standard drawing dies, are announced by Carboloy Co. Inc., P. O. Box 239, R. Pk. A., Detroit.

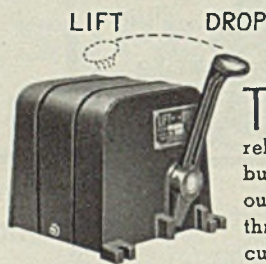
Introduction of the R-18 type as a standard provides for nib dimen-

sions of 5.50 inches diameter by 2.125 inches in height, with a casting dimension of 9 x 3¼ inches. It is designed for drawing work ranging from 2¼ to 3½ inches diameter.

In addition, "cored" dies previously available only in the smaller—R-1 to R-6—series also are now available in the series R-7 through R-10, for drawing fractional sizes of bar and tubing from 3/16 to ¼-inch in size.

Principal improvement in the larger series of dies, from the R-10 through R-16, is a material increase in the size of the nib.

THE EC&M Automatic— gives GOOD on ANY



THERE is no other Magnet Controller like the EC&M Automatic. Not only does it give fast, clean releases of the load, speeding up magnet operations, but contacts last many times longer than with previous types. Higher lifting capacity, too, is maintained through cooler magnet operation, since reverse-current is turned off automatically.

Many users of this improved Magnet Controller report unusually long contact life. Possible, because the LINE-ARC principle controls the arc scientifically. At the instant of opening, the arc is transferred from the contacts to the arcing-plate and blow-out guard. This keeps contacts cool, insuring longer life than has ever been possible heretofore.

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AUTOMATIC WELD TIMERS.

EC&M LIFTING For All Sizes and

STEEL

Welding Tubes

(Concluded from Page 68)

the darker area being the weld itself. Here are found ferrite and nodular pearlite, a material with hardness usually equaling that of the parent metal or slightly lower in some cases—yet stronger and of finer grain size.

Slow cooling was found one of the important factors when welding these higher carbon steels, particularly at high production speeds. Other important factors when welding higher carbon and alloy steels include the welding current, speed

and method of adjusting the welding rolls. Of course there is a very definite relation between the first two factors—speed of welding and welding current value—as the heat applied to any point of the weld is a function of both of these. With a mill driven at constant speed and regulation made by adjusting welding current, control is only available in definite steps which sometimes makes it difficult to obtain the exact combination desired—resulting in either an underheated or overheated weld. By using direct-current variable-speed motors with rheostatic control or mechanical

variable-speed transmissions, the equipment shown affords extremely small increments of control and allows precise setting of the speed-current ratio.

To make this control equipment more accessible, a complete benchboard is provided as shown in Fig. 5. Here are located the start-stop buttons for the main mill motor, buttons for welding contactor, increase and decrease speed buttons for motor-driven rheostat or motor driven control on variable-speed transmissions, cut-off motor buttons and other control equipment—together with ammeter, voltmeter and speed indicator for welding. Just below the benchboard and in the same base is the welding current control lever, having 12 points. Centralizing all controls allows the operator to obtain best possible results.

Amount of upset is another factor which must be controlled accurately. The necessary variation is provided by fine adjusting screws with micrometer dials used to set the welder squeeze rolls as desired. These adjusting screws are within easy reach and vision at the front of the welder.

Experimentation Needed

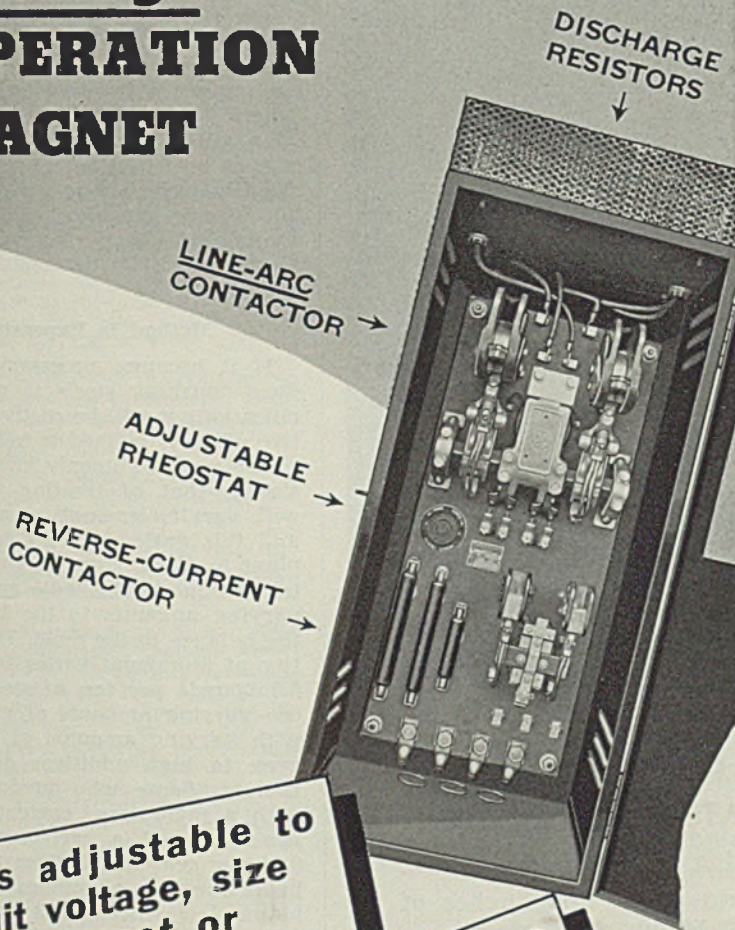
As a result of careful attention to all these factors, the range of work which can be handled is greatly increased. At the present time, standard mills of this design are built in five sizes to produce tubing from ¼-inch outside diameter with 0.02-inch walls to 5-inch diameter with 0.209-inch wall of various strip analyses from hot-rolled, pickled, sandblasted or cold-rolled strip.

Intensive investigation as to possibility of making a standardized mill to work all known weldable materials has shown this to be a difficult task. The demand for welded tubing of lighter weight and higher strength necessitates continued experimentation. Continued effort in this direction open the field to new producers of tubular shapes. It is entirely possible that such equipment as described here may be amortized on specialty products while building sales on the common or more standard types—this allowing experimental work to be done at minimum or no extra cost.

By experimenting on the new materials, weldable alloys having higher strength are being discovered. This method of attack often is much more practical than attempting to produce tubing from a specified alloy which may not be welded easily.

Advances in development of light-weight vehicles and aircraft are sure to result in a rapidly expanding demand upon tubing manufacturers.

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Age Hardening

(Concluded from Page 50)

well B hardness. To measure strain-aging other samples were cold rolled 15 per cent, heated to 850 degrees Fahr., for five minutes and tested 24 hours later. He explained that high oxygen lost 88 per cent and low oxygen 12 per cent of original impact strength.

It is evident that the extent of aging in fully rimming or effervescent steel is mostly dependent on steelmaking practice and processing and is not essential to manufacture the high cost nonaging

steels to meet present-day requirements of the stamping trade. The further steel practices drift out of equilibrium the greater becomes the susceptibility of the steel to age, which generally means greater amounts of oxygen, etc. In this event the Rockwell B hardness may increase 15 or more points, which would render the product unfit for use.

The fact that strain aging can be minimized by deoxidation in rimming steel and to a greater degree in fully deoxidized steel, indicates its association with the oxygen content of the metal. Actual

precipitation with strain aging has not been definitely established; precipitation with quench aging, however, is more apparent. With strain aging there evidently is some mechanism that affects only a sort of physical system of distortion of the lattice parameter or crystallographic relationship without a change of microstructure.

The processings of the steel that show slight aging were all reduced to 0.0375 gage from hot band gages ranging from 0.060 to 0.140 and all annealed over 1280 degrees Fahr., averaging approximately 35 hours over 1240 degrees Fahr., at the lowest temperature point in the box annealing. This material had a well-defined grain with sharp demarcation of the grain boundaries such as represented in Fig. 5.

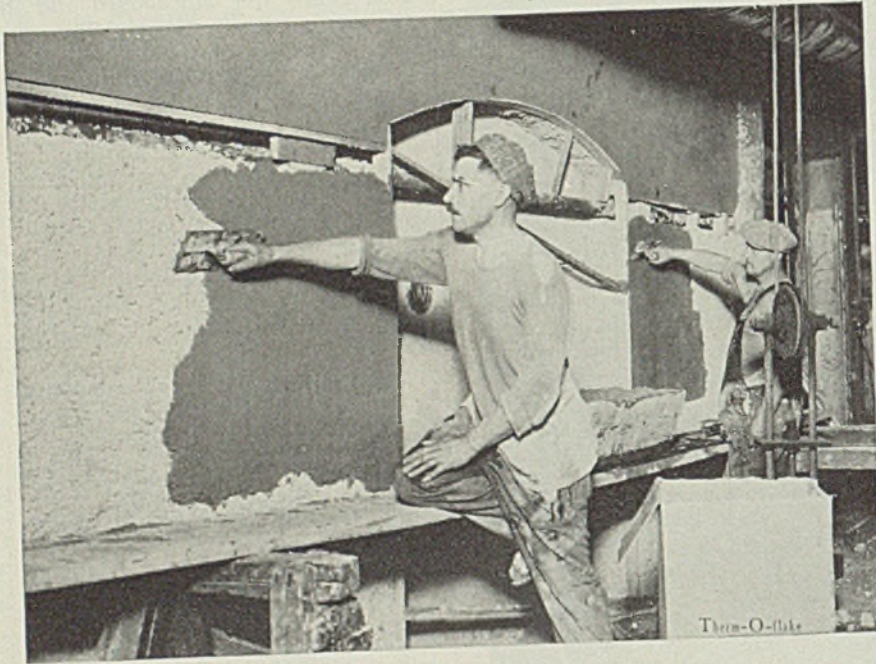
On the other hand samples selected at random which had aged to varying degrees, often had poor or imperfect microstructure either where the grains were considerably elongated because of insufficient anneal or where minute grains existed between a more normal grain or where granular pearlite was present. The photomicrograph shown in Fig. 3 represents this condition.

Method Is Expensive

If it becomes necessary to produce nonaging steels to meet specifications it will be costly irrespective of what method is followed.

The most commonly known practice is that of treating the steel with varying amounts of aluminum and this varies a great deal from plant to plant, some adding the total amount to the ladle and others varying amounts to the ladle and the balance to the mold. This quantity of aluminum varies from 2 to 65 pounds per ton of steel. Some use varying amounts of aluminum with varying amounts of titanium even to high additions of the titanium. Some who produce steel with a manganese content of 0.80 per cent and a carbon of about 0.04 per cent and bottom pour the heats use less aluminum. At some plants low silicon, 0.02 to 0.05 or 0.03 to 0.07 per cent, is used and deoxidation is completed with aluminum. Some is made in regular molds without hot-tops, some with; others follow the practice of using big-end-up molds with hot tops. Then again heating is more costly with the problem of yield and surface conditioning of the slab becoming more important than with rimmed steel. Furthermore, annealing is more important requiring higher temperatures and soaking time.

Most of these nonaging steels are of low carbon generally from 0.01 to 0.05 per cent carbon and manganese usually over 0.35 per cent.



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The principle of this method of deoxidation is to have an excess of aluminum to free dissolved oxygen and to yield a residual metallic aluminum. The amount may vary from 0.02 to 0.08 per cent or higher depending upon the previously existing condition of the steel or the method of refining the melt.

Of course it is possible to attain excellent physical properties and qualities with nonaging steels; that is, low Rockwell, high Olsen and high elongation values. There is a method of emulsifying low-carbon steel with molten acid slag to attain deoxidation which does not introduce residual nonmetallic inclusions that are ever present with metallic deoxidizers. The cost factor must necessarily be borne in mind when considering a change to a nonaging high-cost steel.

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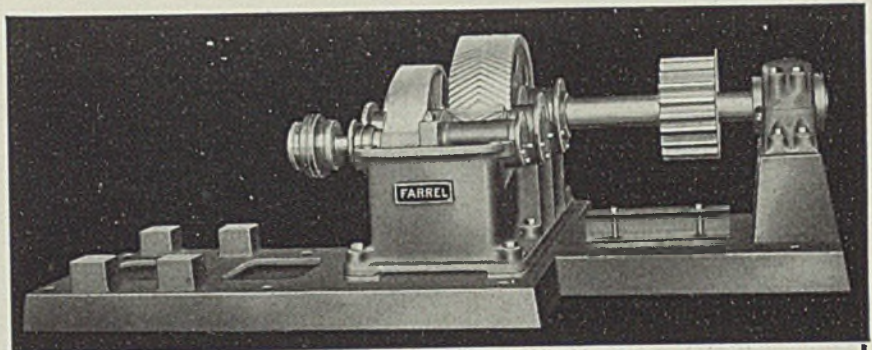
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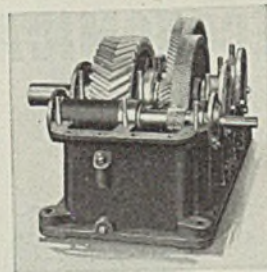
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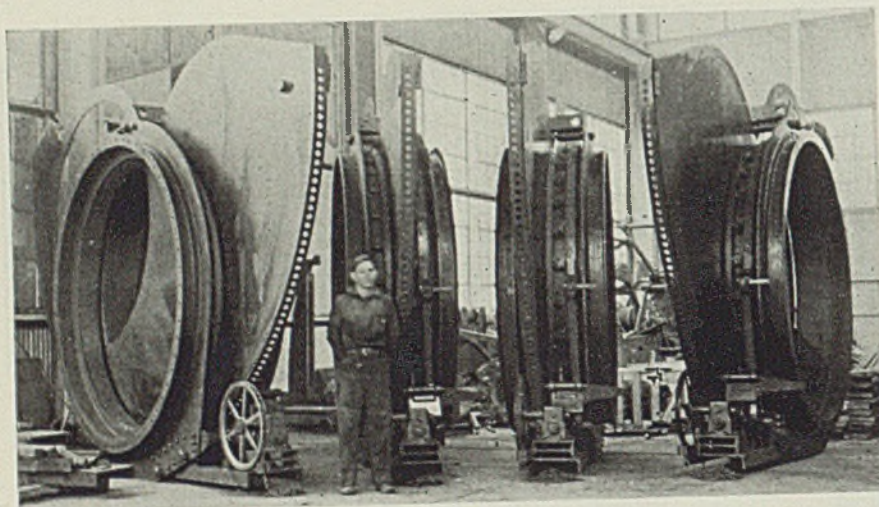
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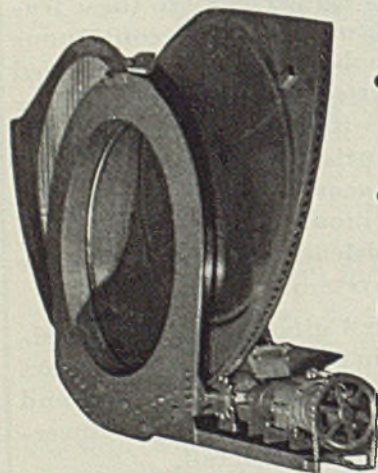
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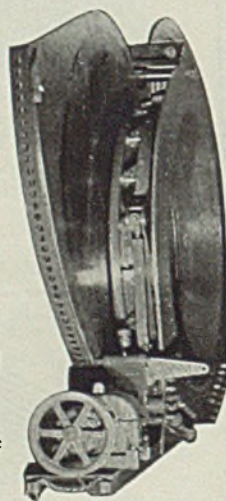
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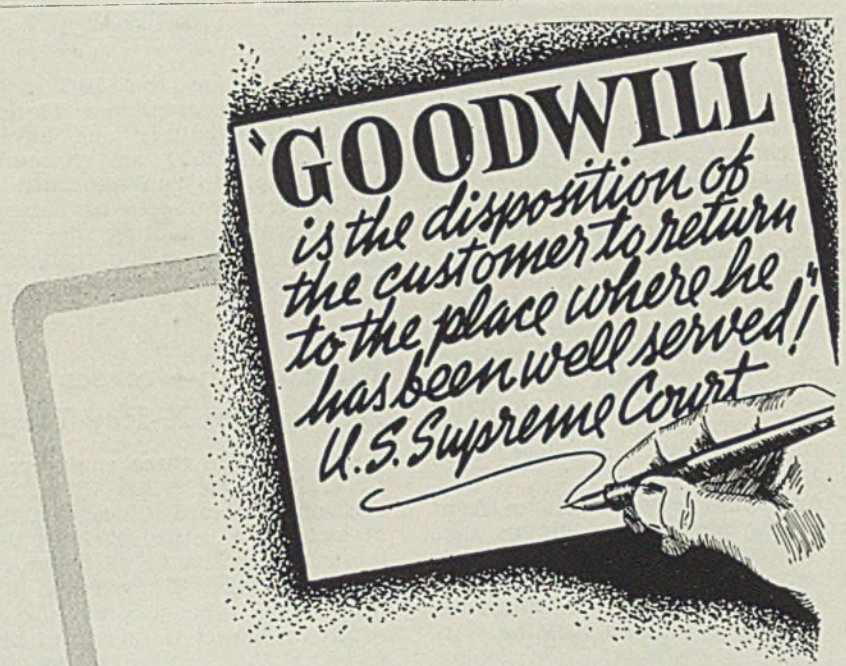
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Fork Trucks, Pallets

(Concluded from Page 56)

tional horsepower motors from Fort Wayne to Schenectady, a unit load was designed that could be packed and steel strapped as the motors came off the assembly line at Fort Wayne—200 motors to a unit. This same unit load was suitable for delivery to the refrigerator assembly line at Schenectady.

When first it was proposed to ship these units as a floating load in a freight car, there was considerable discussion as to whether it was advisable to ship carload motors without bracing, see Fig. 4. However, the method has proved so successful that we are now shipping fractional motors to approximately 20 customers in this manner—with no bracing in the car.

As to whether the light materials and cartons can be handled safely when stacked loose on pallets, the fork trucks are equipped with motor-driven mechanism to tilt the mast either forward or backward. High backrests are used on the fork carriage when bulky materials are handled. During transit, the mast is tilted backward so the material leans against the back rests. Where light materials on pallets are transported over rough pavements on yard trailers, they are wired onto the pallets.

As to the longest distance from receiving platform to storage that is practical, it has been found approximately 100 yards is the most efficient haul. However, transporting up to 300 yards may be warranted on occasions. On longer hauls, the pallet loads are placed

on trailers by the fork truck and then are transported to the stock room using the fork truck as a tractor. The truck unit then is right at hand to unload trailers and tier the material in the stockroom.

As regards running out of power with the battery trucks, all these trucks are operated two or three shifts so two sets of batteries with enough capacity for an 8-hour shift are purchased for each truck. Thus one set can be charged while the other is in service. They are then changed between shifts to give continuous operation of the truck. Where truck operation is exceptionally hard, the battery may be charged at noon after 4 hours' service.

Batteries for the 10,000-pound truck are an adaptation of the locomotive type battery and have a capacity of 1000 ampere-hours—easily ample to run the truck for 12 hours. Two sets of batteries then permit operating the truck 24 hours a day as the changeover takes only a few minutes.

Metal Film Greases Bearings of X-Ray Target

According to three engineers of General Electric X-Ray Corp., 2012 Jackson boulevard, Chicago, a film of metal is a better lubricant than lubricating grease or oil under certain conditions. They found that in a special type of x-ray tube, in which the target is rotated at high speed, a thin coating of metallic barium makes an efficient lubricant.

In the high vacuum demanded by x-ray tubes ordinary lubricants are out of question since any vaporization of the lubricant spoils the vacuum and renders the tube useless.

The vaporizing of metallic barium to place a film on the steel ball bearings of the rotating target greatly reduces the friction.

Under the normal operating temperatures of the x-ray load the film will effectively lubricate an anode bearing for 50 to 100 hours of rotation. As the average time of rotation per x-ray exposure is about five seconds, this corresponds to between 36,000 and 72,000 exposures of the sort usually made in studying the chest or heart.

It seems possible that application can be made to other cases in which rotating devices have to be operated in vacuum, according to the engineers.

Reader Comments

(Concluded from Page 4)

we spend more and more time producing less and less until we have turned the clock backward to complete hand economy and scarcity.

Is it not thus evident that the only path for this country to take is to continue to employ efficient methods so that we can produce more with less effort? After all, a high standard of living consists simply in having things we want, and we cannot have these things unless they are first produced or manufactured. We must have confidence that the system which brought this country into its position of leadership in the world will continue to work. In fact, it is continuing every day.

It is rather obvious that if this thoughtless move to penalize the use of efficient machines should gain headway the first to suffer would be the men employed in this and all other similar plants, because the machines produced are all intended to do some job more efficiently, with less effort and cost than with methods formerly employed.

Why is it so many people seem willing to turn away from the very system of free enterprise which has given them so much? Why are there people willing to trade this free opportunity to advance to any height their ability allows, for an unknown system or one already proved a failure in other countries?

Why give any attention at all to the idea that we suffer from overproduction, too much technology, must stop invention, declare a patent holiday, turn back to the old handicrafts?

L. J. FLETCHER

Assistant general sales manager,
Caterpillar Tractor Co.,
Peoria, Ill.

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< < HELPFUL LITERATURE > >

1. Speed Reducers

D. O. James Manufacturing Co.—40-page illustrated catalog No. 18 presents selection tables, specifications, and dimensional diagrams of motorized worm gear reducers, and universal couplings. Service classifications and character of load data are outlined to help in selecting proper reducer.

2. Broaches

Colonial Broach Co.—90-page illustrated catalog No. B-62 gives technical information and specifications on all types of broaches including burnishing, round push and pull, round hole and keyway, rectangular and square, tungsten carbide. Chart of pull end sizes for auto puller is included.

3. Pistons

Aluminum Co. of America—44-page illustrated bulletin No. AD-34 explains types of pistons and their applications. Tables give physical and mechanical properties of four common piston materials. Qualities of various piston finishes are discussed. Features of aluminum cylinder heads are shown.

4. Bronze Products

Atlas Brass Foundry—64-page illustrated catalog 30 features bronze bushings, bearings and rough and finished stock. Sizes and grades of available bronze are listed. Prices and specifications are included.

5. Heavy Machinery

Williams, White & Co.—64-page illustrated plastic bound catalog, "Machinery," covers in brief form a line of machinery for bending, forming, rolling, punching, shearing of sheet and plate steel, bar and structural shapes, and pipe and tube bending equipment. Descriptions and specifications on equipment are given.

6. Tumbling Barrels

Globe Machine & Stamping Co.—12-page illustrated catalog No. B-6 is descriptive of complete line of finishing-tumbling barrels for use with many types of products. Specifications are given on tilting and horizontal models with shells of steel, cast iron, brass, wood monel or stainless steel.

7. Blower Wheels

Advance Aluminum Castings Corp.—80-page catalog illustrates and describes complete line of "Castalu" fan and blower wheels. Included are performance charts and tables showing capacity of fans at various speeds and static pressures. Aid is given for laying out housing for any size of fan.

8. Spray Nozzles

Trabon Engineering Corp.—4-page illustrated folder, "Spray Nozzles," shows typical applications of these units for descaling and cooling of hot steel. Nozzles consist of two parts,—header adapter made of stainless steel and nozzle forged from solid bar of Monel.

9. Alloy Steel

Babcock & Wilcox Tube Co.—Technical data card No. 11 summarizes data on Croloy 2½ which was developed for application in steam superheating, piping, and oil refining operations where corrosion resistance is required, together with maximum creep strength.

10. Contour Sawing

Continental Machines, Inc.—4-page illustrated circular shows by photographs the comparison between contour sawing method of removing metal and shaping, turning, milling, nibbling, and torch cutting machining methods.

11. Stainless Wire

Allegheny Ludlum Steel Corp.—8-page bulletin B-108 lists metal wire products and gives practical data in determining grades, finishes, and tempers of stainless steel wire which may be used for general applications. Principal uses and specifications are included.

12. Turbine Blowers

Allis-Chalmers Manufacturing Co.—24-page illustrated bulletin No. B-6048 presents description, data and applications of single stage "Turbo-Blowers" for use in industry wherever large volumes of air or gas are needed at pressures from one to 6.25 pounds.

13. Bronze

Koppers Co.—2-page illustrated bulletin BB-2 describes uses and advantages of D-H-S (ductility, hardness, strength) bronze for steel industry. It lists recommended applications and minimum physical properties of bronze 1, 2, 3, and 4.

14. Hydraulic Presses

Hydraulic Press Manufacturing Co.—8-page illustrated bulletin No. 4007 describes and gives applications, operating systems and sizes of basic, dehydrating, blocking, briquetting, forming, molding, extruding, and laboratory presses.

15. Gear Reducers

Link-Belt Co.—Illustrated book No. 1519 contains revised information on complete line of herringbone gear reducers. Addition of several new sizes and changes in construction have brought about revisions in horsepower ratings and in dimensions of these units.

16. Industrial Ovens

Kirk & Blum Manufacturing Co.—20-page illustrated spiral-bound catalog "Industrial Ovens" deals with enameling, drying and baking ovens. Complete data on typical installations show applications of various designs of units in all types of industries.

17. Industrial Brushes

Fuller Brush Co.—6-page illustrated folder on "Steelgrip" brushes of all types for industrial applications. These brushes, in which brush material is held in steel, are widely adopted in vacuum cleaners, steel mills, rubber factories, and many types of machines. Special brushes are made to specifications.

18. Enameling Sheets

Inland Steel Co.—8-page illustrated bulletin "Inland Enameling Iron Sheets" presents data on this material which is claimed to give better performance in shop and longer service because of controlled chemical bond plus mechanical keying between porcelain enamel and base metal.

19. Transmission Belts

Hewitt Rubber Corp. 6-page illustrated folder, "Make Every Unit of Power Count," includes rubber belting price list, horsepower per inch width, horsepower correction factors, arc of contact, and belt speed tables. Seven types of transmission belts are described.

20. Optical Aids

Bausch & Lomb Optical Co.—16-page illustrated catalog No. D-22 is descriptive of optical aids for use in metal working industries. Products covered include toolmaker's microscope, wide field binocular microscope, shop microscope, wide field tube, Brinell microscope, magnifiers, optical drill gage, optical protractor and other instruments.

21. Surface Grinder

Blanchard Machine Co.—24-page illustrated catalog No. 18 presents complete details and specifications of the No. 18 surface grinder for machining flat surfaces. Many examples of work performed on small parts and large pieces and machine applications are illustrated and described.

22. Electronic Apparatus

General Electric Co.—20-page illustrated booklet No. GES-2411 briefly lists vacuum-tube apparatus and explains its application and method of operation. Includes descriptions of phototubes, d.c. motor control, exposure meters, pyrometers, and ignitron rectifiers.

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23. Cranes

Harnischfeger Corp.—26-page illustrated bulletin No. H-13 includes views showing applications and features of Trav-Lift materials handling system cranes in production bay or assembly room, storage yard, warehouse, loading and unloading zones. Charts show dimensions.

24. Atmosphere Furnace

Surface Combustion Corp.—4-page illustrated bulletin No. SC-92 discusses features of radiant tube vertical type furnace which permits prepared and controlled atmosphere to eliminate, all scaling and decarburizing during the heating and soaking periods.

25. Generating Unit

Westinghouse Electric & Manufacturing Co.—Illustrated descriptive data No. 3808 gives complete information on self-contained alternating current generators with integral exciters, instruments, voltage regulators and control.

26. Fastenings

Tinnerman Products, Inc.—16-page catalog on "Fastenings" illustrates and explains 61 different spring tension "Speed Nut" applications in assembly of automobiles, radios, stoves, heaters, trucks, electrical appliances, and aircraft.

27. Industrial Ovens

Despatch Oven Co.—12-page illustrated bulletin No. 51 gives full details of finish baking and drying ovens for synthetic enamels, lacquers, varnishes, paints, enamels, and japans. Helpful hints are given for drying system design and lay-out.

28. Bar & Tube Machine

Taylor-Wilson Manufacturing Co.—4-page illustrated bulletin is descriptive of the new "Taylor-Wilson" No. 1 straightening, sizing and burnishing machine for round bars and tubes in sizes from 1/16 to 1/2 inches. Features of this unit are accuracy, speed, compactness, and ease of set-up.

29. Slitting & Coiling Line

Strohn Tool & Manufacturing Co.—8-page illustrated bulletin No. A1799P gives details of operation and gives full specifications of the "Stamco" pull-through slitting and coiling line, which consists of pay-off reel, slitting unit, scrap cutter, tension reel, and coil carrier.

30. Grating & Stair Treads

Blaw-Knox Co.—24-page illustrated catalog No. 1773 presents information on electroformed steel grating and stair treads. Section devoted to method of manufacturing of this product also portrays micrographic analysis of forged structure. Included are illustrations of wide range of uses and table of safe loads and size variations.

«« HELPFUL LITERATURE

(Continued)

31. Washers

Whitehead Stamping Co.—16-page illustrated bulletin No. 1538 gives features, specifications, diagrams of standard flat steel, plate, flat brass tongue, and other washers. List of available sizes of plain flat round washer combination dies is included.

32. Hydraulic Equipment

Curtis Pneumatic Machinery Co.—12-page illustrated broadside No. C-39 briefly describes air and water cooled compressors, air hoists and cylinders, circular and cross-cut saws, lifting cylinders, industrial hydraulic lifts, and air conditioning units.

33. Industrial Instruments

Foxboro Co.—4-page illustrated folder No. 776 is reprint of testimonials quoting cost savings effected through the application of temperature, pressure, humidity, liquid level, flow, or time and motion instruments to process and industrial operations.

34. Turret Lathes

Gisholt Machine Co.—Four 2-page illustrated data sheets feature case studies of metal-turning operations on turret and automatic lathes, and static-dynamic balancing on a Dynetric balancing machine. Operation sequence, feeds, cutting speeds, and machining times are explained.

35. Conveyor Belts

B. F. Goodrich Co.—32-page booklet, "Cost Finding Record for Conveyor Belts," contains 12 sheets on which to keep records on 12 conveyor belts for six years, with tonnage records for each month on each belt. Sheets include space for such information as make, duck weight, length, width, plies, type of joint, lacings used, cost of repairs, and time in use.

36. Dust Collector

American Foundry Equipment Co.—11-illustrated circular No. 32 discusses features of high efficiency, long cone, cyclone dust collector which separates dust from air stream by centrifugal force. How relatively low back pressure is combined with high efficiencies.

37. Tipped Tools

McKenna Metals Co.—Heavy cardboard 9 x 4 in. chart No. 5, which is offered gratis, lists horsepower requirements for cutting steel with Kennametal-tipped tools. It enables quick calculation of what depth and feed machine will pull in cutting steel with these tools.

38. Broaching Machine

Oilgear Co.—8-page illustrated bulletin No. 21000 describes fluid power variable speed, type XB-12 twin horizontal broaching machine for high speed, dual pull type, small and medium and internal and external broaching. Features are discussed.

39. Dies

Meehanite Research Institute—4-page illustrated bulletin No. 11 includes table of properties available in Meehanite dies. It presents a variety of applications and performance records. Typical examples of products made by drawing and forming operations are shown.

40. Riveting Machine

Tomkins-Johnson Co.—8-page illustrated bulletin No. R-4 discusses features of Rivitor, machine for automatically feeding and setting solid rivets. Presents details of actual riveting operation, including the method of controlled setting action.

41. Plastic Molding Steels

Crucible Steel Co. of America—8-page illustrated booklet No. SP101 contains a handy guide for selecting proper steels for plastic molding. Applications and qualifications are given for "Crusca" cold chubbing steel, "Halcomb's" alloy, "Plastic C. S. M." No. 2, and "Ketos" oil hardening steel.

42. Gear Alloys

International Nickel Co.—16-page illustrated bulletin, "Modern Trends in Nickel Steel & Cast Iron Gear Materials," is reprint of paper presented at meeting of American Gear Manufacturers' Association. Tables of compositions and properties are included.

43. Alloy Steel

Jessop Steel Co.—6-page illustrated folder is descriptive of "Truform," a non-shrinkable, oil hardening alloy steel for use in tools and dies where extreme accuracy is required. Physical properties, recommended heat treatment, tempering range and typical applications are covered.

44. Wire Rope

Macwhyte Co.—4-page illustrated bulletin discusses in dialogue form how the company's internal lubrication is application of a heavy viscous lubricant to wires as they go through die to become strand for wire rope. It explains why impregnated core means.

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Steel Users Buying For First Quarter

General demand quickens as defense needs grow. Exports set new record. Coke prices rise. Scrap continues upward movement

■ WITH additional tonnage coming to mills, already operating close to practical capacity, efforts to meet delivery demands caused the production rate last week to rise $\frac{1}{2}$ -point, to 93 $\frac{1}{2}$ per cent.

Consumer anxiety to cover requirements has caused some orders to be booked for first quarter delivery, at prices prevailing at time of delivery. This tonnage is not large but increasing, indicating the attitude of consumers toward future commitments. In addition to increasing demands for defense needs mills are receiving orders from a wider variety of miscellaneous consumers. Some accumulation of inventory is taking place but it is not considered larger than conditions warrant.

Loading of steelmaking scrap for export to Japan is being expedited at a number of ports in anticipation of the embargo effective Oct. 15. Possibility of tonnages being thrown back on the domestic market has not yet had an appreciable effect and prices are advancing in a number of centers in spite of this factor. Much of the export scrap has been gathered in districts remote from steelmaking centers where its effect on the domestic situation has not been important. Prices realized on recent railroad lists have been at higher levels, affording an accurate indication of the industrial pulse. The composite of steelmaking scrap advanced 16 cents to \$20.62 last week as Pittsburgh quotations rose. The same influence caused the iron and steel composite to rise 7 cents to \$38.05.

Automobile production continues to increase, 105,153 cars being produced last week, an increase of 9163 over the preceding week and nearly 40 per cent above the 76,095 produced in the corresponding week last year. This rate means rapid consumption of steel and mills are being pushed for deliveries to maintain the high rate.

Pig iron production in September totaled 4,172,551 net tons, 1.5 per cent under the August output, because of one less working day, but constituting the largest September production since this publication started compilation in 1918. The daily rate in September was 139,085 tons, 1.8 per cent greater than the 136,599 tons daily average in August. This was the highest daily rate for any month since May, 1929.

MARKET IN TABLOID ★

Demand

Continues strong; some first quarter buying.

Prices

Coke advancing; scrap rises further.

Production

Up $\frac{1}{2}$ -point to 93 $\frac{1}{2}$ per cent.

Active blast furnaces increased from 190 to 192 in September.

Steel exports in August set an alltime record, with 1,046,084 tons, exclusive of scrap, superseding the former record of 707,809 tons in July. This is the first time exports have exceeded 1,000,000 tons in a month. Great Britain was the largest buyer, taking between 60 and 65 per cent of the total. Tonnage going to Canada, which is indirectly largely for Great Britain, was also heavy. Total shipments for eight months were three and a half times those for the corresponding months last year. Scrap exports, at 355,991 tons, were only slightly greater than the 327,129 tons in July and the total for eight months was less than in the same period last year.

By-product coke prices are advancing as producers foresee a shortage among the possibilities this fall. As usual in time of heavy fuel demand beehive ovens are being lighted to supplement by-product production and the outcome depends largely on the number of the latter put in service. Some additional by-product capacity is under construction, which will ease the situation when it is completed.

Association of American Railroads, after survey of expected demands on carriers, has recommended purchase of 100,000 additional freight cars in the year ending Oct. 1, 1941. At the usual rate this would require about 1,000,000 tons of steel, largely plates. Freight car awards in September were 9735 units, bringing the total for nine months to 39,297, highest since 1937.

Slight changes in production caused a net increase of $\frac{1}{2}$ -point in the operating rate, moving up to 93 $\frac{1}{2}$ per cent, a new high, with indications of little change in coming weeks. Chicago gained 1 $\frac{1}{2}$ points to 97 $\frac{1}{2}$ per cent, making up part of the previous week's drop. Youngstown gained 1 point to 85 per cent, Cleveland 2 points to 88, New England 3 points to 88, Cincinnati 2 points to 90 and St. Louis 2 $\frac{1}{2}$ points to 82 $\frac{1}{2}$ per cent. Pittsburgh dropped 1 point to 87 $\frac{1}{2}$ per cent. Rates were unchanged at Detroit, 94 per cent; Birmingham, 97; Buffalo, 90.5; Wheeling, 97; Eastern Pennsylvania, 92.

COMPOSITE MARKET AVERAGES

	Oct. 5	Sept. 28	Sept. 21	One Month Ago Sept., 1940	Three Months Ago July, 1940	One Year Ago Oct., 1939	Five Years Ago Oct., 1935
Iron and Steel	\$38.05	\$37.98	\$37.96	\$37.93	\$37.63	\$37.62	\$32.84
Finished Steel	36.60	36.60	36.60	36.60	36.60	36.60	33.70
Steelworks Scrap ..	20.62	20.46	20.13	20.05	18.56	21.45	12.72

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material	Oct. 5,	Sept.	July	Oct.	Pig Iron	Oct. 5,	Sept.	July	Oct.
	1940	1940	1940	1939		1940	1940	1940	1940	1939
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh	\$24.34	\$24.34	\$24.34	\$24.34
Steel bars, Chicago	2.15	2.15	2.15	2.15	Basic, Valley	22.50	22.50	22.50	22.50
Steel bars, Philadelphia	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia	24.34	24.34	24.34	24.34
Iron bars, Chicago	2.25	2.15	2.15	2.15	No. 2 foundry, Pittsburgh	24.21	24.21	24.21	24.21
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago	23.00	23.00	23.00	23.00
Shapes, Philadelphia	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham	19.38	19.38	19.38	19.38
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2 del. Cincinnati	22.89	22.89	22.89	22.89
Plates, Pittsburgh	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ. av.)	25.215	25.215	25.215	25.215
Plates, Philadelphia	2.15	2.15	2.15	2.275	Malleable, Valley	23.00	23.00	23.00	23.00
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Chicago	23.00	23.00	23.00	23.00
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.00	Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	30.34
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh	23.17	23.17	23.17	23.17
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	105.33
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.00					
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05	Scrap				
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50	Heavy melt. steel, Pitts.	\$20.75	\$20.15	\$19.55	\$23.15
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60	Heavy melt. steel, No. 2, E. Pa.	19.75	19.69	17.50	20.00
Tin plate, per base box, Pitts.	\$5.00	5.00	5.00	5.00	Heavy melting steel, Chicago	20.25	19.31	17.45	19.25
Wire nails, Pittsburgh	2.55	2.55	2.55	2.50	Rails for rolling, Chicago	23.25	21.37	21.65	21.90
					Railroad steel specialties, Chicago	23.25	21.62	21.00	21.75

Semifinished Material

Sheet bars, Pittsburgh, Chicago	\$34.00	\$34.00	\$34.00	\$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to 3/4-inch, Pitts.	2.00	2.00	2.00	1.92

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled	
Pittsburgh	2.10c
Chicago, Gary	2.10c
Cleveland	2.10c
Detroit, del.	2.20c
Buffalo	2.10c
Sparrows Point, Md.	2.10c
New York, del.	2.34c
Philadelphia, del.	2.27c
Granite City, Ill.	2.20c
Middletown, O.	2.10c
Youngstown, O.	2.10c
Birmingham	2.10c
Pacific Coast ports	2.65c
Cold Rolled	
Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast ports	3.70c
Galvanized No. 24	
Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c

Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast ports	4.05c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.55c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.40c	4.00c

Plates ..	21.50	22.00	25.50	30.50
Sheets ..	26.50	29.00	32.50	36.50
Hot strip ..	17.00	17.50	24.00	35.00
Cold stp. ..	22.00	22.50	32.00	52.00

Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast ports	2.75c

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.46c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.10c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast ports	2.65c

Tin and Terne Plate

Tin Plate, Coke (base box)	
Pittsburgh, Gary, Chicago	\$5.00
Granite City, Ill.	5.10
Mfg. Terne Plate (base box)	
Pittsburgh, Gary, Chicago	\$4.30
Granite City, Ill.	4.40

Bars

Soft Steel	
(Base, 20 tons or over)	
Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast ports	2.80c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel		No. 302	No. 304
Bars	24.00	25.00	
Plates	27.00	29.00	
Sheets	34.00	36.00	
Hot strip	21.50	23.50	
Cold strip	28.00	30.00	

Straight Chromes

No.	No.	No.	No.	
410	430	442	446	
Bars ..	18.50	19.00	22.50	27.50

Structural Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21 1/2c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c

Rail Steel	
(Base, 5 tons or over)	
Pittsburgh	2.05c
Chicago or Gary	2.05c
Detroit, delivered	2.15c
Cleveland	2.05c

STEEL

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Buffalo	2.05c
Birmingham	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.70c

Iron

Chicago	2.25c
Philadelphia, del.	2.37c
Pittsburgh, refined	3.50-8.00c
Terre Haute, Ind.	2.15c

Reinforcing

New Billet Bars, Base	
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Rail Steel Bars, Base

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.50c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads	
Standard and cement coated wire nails	\$2.55
(Per Pound)	
Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c
Woven wire fencing (base C. L. column)	
Single loop bale ties, (base C.L. column)	56
Galv. barbed wire, 80-rod spools, base column	70
Twisted barbless wire, column	70

To Manufacturing Trade	
Base, Pitts. - Cleve. - Chicago Birmingham (except spring wire)	
Bright bess., basic wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Worcester, Mass., \$2 higher on bright basic and spring wire.	

Cut Nails

Carload, Pittsburgh, keg.	\$3.85
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Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c
*Delivered.		

Alloy Bars (Hot)

(Base, 20 tons or over)			
Pittsburgh, Buffalo, Chi.			
ago, Massillon, Canton, Bethlehem	2.70c		
Detroit, delivered	2.80c		

	Alloy	Alloy	
S.A.E.	Diff.	S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.70	3300	3.80
2500	2.55	3400	3.20
4100 0.15 to 0.25 Mo. 0.55			
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.20			
5100 0.80-1.10 Cr. 0.45			
5100 Cr. spring flats 0.15			
6100 bars 1.20			
6100 spring flats 0.85			
Cr. N., Van. 1.50			
Carbon Van. 0.85			
9200 spring flats 0.15			
9200 spring rounds, squares 0.40			
Electric furnace up 50 cents.			

Alloy Plates (Hot)

Pittsburgh, del.	3.525c
Chicago, del.	3.53c

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less	
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast ports	2.75c
Cooperage hoop, Young., Pitts.; Chicago, Birm.	2.20c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown, Chicago	2.80c
Detroit, del.	2.90c
Worcester, Mass.	3.00c
Carbon Cleve., Pitts.	
0.26-0.50	2.80c
0.51-0.75	4.30c
0.76-1.00	6.15c
Over 1.00	8.35c
Worcester, Mass. \$4 higher.	

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c
Lamp stock up 10 cents.	

Rails, Fastenings

(Gross Tons)	
Standard rails, mill	\$40.00
Relay rails, Pittsburgh 20-100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	\$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c
Base, light rails 25 to 60 lbs., 20 lbs., up \$2; 16 lbs., up \$4; 12 lbs., up \$8; 8 lbs., up \$10. Base railroad spikes 200 kegs or more; base plates 20 tons.	

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discount counts for carloads additional 5%, full containers, add 10%.	
Carriage and Machine	
½ x 6 and smaller	68 off
Do., ¾ and ¾ x 6-in. and shorter	66 off
Do., ¾ to 1 x 6-in. and shorter	64 off
1 ½ and larger, all lengths	62 off
All diameters, over 6-in. long	62 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate	72.5-10 off; with nuts attached
72.5 off; bulk 82 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.	
Step bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex. U.S.S.	S.A.E.
½-inch and less	66 70
¾-1-inch	63 65
1 ½-1 ½-inch	61 62
1 ½ and larger	60

Hexagon Cap Screws

Upset 1-in., smaller	70.0 off
Square Head Set Screws	
Upset, 1-in., smaller	75.0 off
Headless set screws	64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.85c
Pacific Coast ports	2.95c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.	
Structural	3.40c
¾-inch and under	65-10 off
Wrought washers, Pitts., Chl., Phila., to jobbers and large nut, bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 ½ and 1 ½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel			
In.	Blk.	Galv.	
½	63 ½	54	
¾	64 ½	58	
1-3	68 ½	60 ½	
Iron			
¾	30	13	
1-1 ¼	34	19	
1 ½	38	21 ½	
2	37 ½	21	
Lap Weld Steel			
2	61	52 ½	
2 ½-3	64	55 ½	
3 ½-6	66	57 ½	
7 and 8	65	55 ½	
Iron			
2	30 ½	15	
2 ½-3 ½	31 ½	17 ½	
4	33 ½	21	
4 ½-8	32 ½	20	
9-12	28 ½	15	

Line Pipe Steel			
1 to 3, butt weld	67 ½		
2, lap weld	60		
2 ½ to 3, lap weld	63		
3 ½ to 6, lap weld	65		
7 and 8, lap weld	64		
Iron			
¾ butt weld	25	Galv.	7
1 and 1 ¼ butt weld	29		13
1 ½ butt weld	33		15 ½
2 butt weld	32 ½		15
1 ½ lap weld	23 ½		7
2 lap weld	25 ½		9
2 ½ to 3 ½ lap weld	26 ½		11 ½
4 lap weld	28 ½		15
4 ½ to 8 lap weld	27 ½		14
9 to 12 lap weld	23 ½		9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut-lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded			
Sizes	Gage	Steel	Charcoal Iron
1 ½" O.D.	13	\$ 9.72	\$23.71
1 ¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2 ¼" O.D.	13	13.79	21.68
2 ½" O.D.	12	15.16	26.57
2 ¾" O.D.	12	16.58	29.00
3" O.D.	12	17.54	31.36
3 ½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
3" O.D.	7	68.14	.....

Seamless			
Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	\$ 7.82	\$ 9.01
1 ¼" O.D.	13	9.26	10.67
1 ½" O.D.	13	10.23	11.79
1 ¾" O.D.	13	11.64	13.42

2" O.D.	13	13.04	15.03
2 ¼" O.D.	13	14.54	16.76
2 ½" O.D.	12	16.01	18.45
2 ¾" O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 ½" O.D.	12	19.50	22.48
3 ¾" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 ½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe-Pet Net Ton	
6-in., & over, Birm.	\$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00
Class A Pipe \$3 over Class B Std. fltgs., Birm., base \$100.00.	

Semifinished Steel

Rerolling Billets, Slabs (Gross Tons)	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00
Forging Quality Billets	
Pitts., Chl., Gary, Cleve., Young, Buffalo, Birm.	40.00
Duluth	42.00
Sheet Bars	
Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00
Wire Rods	
Pitts., Cleveland, Chicago, Birmingham No. 5 to ¾-inch incl. (per 100 lbs.)	\$2.00
Do., over ¾ to 1 ¼-in. incl.	2.15
Worcester up \$0.10; Galveston up \$0.25; Pacific Coast up \$0.50.	

Skelp	
Pitts., Chl., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, fur.	\$4.35-4.60
Connellsville, fdry.	5.25-5.50
Connell, prem. fdry.	5.75-6.25
New River fdry.	6.25-6.50
Wise county fdry.	5.50-6.50
Wise county fur.	5.00-5.25
By-Product Foundry	
Newark, N. J., del.	11.38-11.85
Chicago, outside del.	11.00
Chicago, delivered	11.75
Terre Haute, del.	11.25
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	11.25
Cincinnati, del.	11.00
Cleveland, del.	11.55
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

Spot, gal., freight allowed east of Omaha	
Pure and 90% benzol.	15.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c
Per lb. f.o.b. Frankford and St. Louis	
Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	7.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	\$28.00

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Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	\$24.00	\$24.50	\$23.50	\$25.00
Birmingham, Ala.	19.38		18.38	24.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50		24.00
Erle, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	22.00			
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00		23.50	
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

†Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:

Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78		23.66	
Boston from Birmingham	24.12			
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00		
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22			
Cincinnati from Hamilton, O.	23.24	24.11	23.61	
Cincinnati from Birmingham	23.06		22.06	
Cleveland from Birmingham	23.32		22.82	
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15			
Newark, N. J., from Bethlehem	25.53	26.03		
Philadelphia from Birmingham	24.46		23.96	
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	
Pittsburgh district from Neville Island				{Neville base, plus 69c, 84c, and \$1.24 freight.
Saginaw, Mich., from Detroit	25.31	25.31	24.81	25.81
St. Louis, northern	23.50	23.50	23.00	

	No. 2 Fdry.	Malle-able	Basic	Besse-mer
St. Louis from Birmingham	†23.12		22.62	
St. Paul from Duluth	25.63	25.63		26.13
†Over 0.70 phos.				

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., \$28.50, base; \$29.74 delivered Philadelphia.

Gray Forge

Valley furnace	\$22.50	Lake Superior fur.	\$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

†Silvery

Jackson county, O., base: 6-6.50 per cent \$28.50; 6.51-7—\$29.00; 7-7.50—\$29.50; 7.51-8—\$30.00; 8-8.50—\$30.50; 8.51-9—\$31.00; 9-9.50—\$31.50; Buffalo, \$1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus \$1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed. Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

Refractories

Ladle Brick

(Pa., O., W. Va., Mo.)

Per 1000 f.o.b. Works, Net Prices	Dry press	\$28.00
	Wire cut	26.00

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	\$60.80	Magnesite	
		Domestic dead-burned grains, net ton f.o.b.	

First Quality

Pa., Ill., Md., Mo., Ky.	47.50	Chewelah, Wash., net ton, bulk	22.00
Alabama, Georgia	47.50	net ton, bags	26.00
New Jersey	52.50		

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75	Basic Brick	
Georgia, Alabama	34.20	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
New Jersey	49.00	Chrome brick	\$50.00
		Chem. bonded chrome	50.00
		Magnesite brick	72.00
		Chem. bonded magnesite	61.00

Ohio

First quality	39.90	Fluorspar	
Intermediate	36.10	Washed gravel, duty pd., tide, net ton	\$25.00-\$26.00
Second quality	31.35	Washed gravel, f.o.b. Ill., Ky., net ton	

Malleable Bung Brick

All bases	\$56.05	Ill., Ky., net ton	
		carloads, all rail	20.00
		Do. barge	20.00
		No. 2 lump	21.00

Silica Brick

Pennsylvania	\$47.50		
Joliet, E. Chicago	55.10		
Birmingham, Ala.	47.50		

Ferroalloy Prices

Ferromanganese, 78-82%, carlots, duty pd.	\$120.00	Do., ton lots	11.75c	Do., spot	145.00	Silicon Metal, 1% Iron, contract, carlots, 2 x 1/4-in., lb.	14.00c
Ton lots	130.00	Do., less-ton lots	12.00c	Do., contract, ton lots	145.00	Do., 2% Spot 1/4c higher	12.50c
Less ton lots	133.50	67-72% low carbon:		Do., spot, ton lots	150.00		
Less 200 lb. lots	138.00	Car- Ton Less loads lots ton		15-18% tl., 3-5% carbon, carlots, contr., net ton	157.50	Silicon Briquets, contract carloads, bulk, freight allowed, ton	\$69.50
Do., carlots del. Pitts.	125.33	2% carb.	17.50c 18.25c 18.75c	Do., spot	160.00	Ton lots	79.50
Spiegelstein, 19-21% dom. Palmerton, Pa., spot	36.00	1% carb.	18.50c 19.25c 19.75c	Do., contract, ton lots	160.00	Less-ton lots, lb.	3.75c
Do., 26-28%	49.50	0.10% carb.	20.50c 21.25c 21.75c	Do., spot, ton lots	165.00	Less 200 lb. lots, lb.	4.00c
Ferrosilicon, 50% freight allowed, c.l.	74.50	0.20% carb.	19.50c 20.25c 20.75c			Spot 1/4-cent higher.	
Do., ton lot	87.00	Spot 1/4c higher		Alsifer, contract carlots, f.o.b. Niagara Falls, lb.	7.50c	Manganese Briquets, contract carloads, bulk freight allowed, lb.	5.00c
Do., 75 per cent	135.00	Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.	0.95	Do., ton lots	8.00c	Ton lots	5.50c
Do., ton lots	151.00	Calcium molybdate, lb. molyb. cont., f.o.b. mill	0.80	Do., less-ton lots	8.50c	Less-ton lots	5.75c
Spot, \$5 a ton higher.				Spot 1/2c lb. higher		Spot 1/4c higher	
Silicomanganese, c.l., 2 1/2 per cent carbon	118.00	Ferrotitanium, 40-45%, lb., con. tl., f.o.b. Niagara Falls, ton lots	\$1.23	Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk	7.00c		
2% carbon, 108.00; 1% contract ton price	133.00	Do., less-ton lots	1.25	Do., ton lots	7.50c		
\$12.50 higher; spot \$5 over contract.		Do., less-ton lots	1.25	Do., less-ton lots	7.75c		
Ferrotungsten, stand., lb. con. del. cars	1.90-2.00	20-25% carbon, 0.10 max., ton lots, lb.	1.35	Do., less 200 lbs.	8.00c		
Ferrovandium, 35 to 40%, lb., cont.	2.70-2.80-2.90	Do., less-ton lots	1.40	Spot, 1/4c higher.		Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton	102.50
Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage	75.00	Spot 5c higher		Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb.	\$2.50	Do., spot	107.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots	11.00c	Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls	\$2.25	Do., smaller lots	2.60	34-40% contract, carloads, lb., alloy	14.00c
		Do., less-ton lots	2.30	Vanadium Pentoxide, contract, lb. contained	\$1.10	Do., ton lots	15.00c
		Spot is 10c higher		Do., spot	1.15	Do., less-ton lots	16.00c
		Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill	0.80			Spot 1/4c higher	
		Ferro-carbon-titanium, 15-18%, tl., 6-8% carb., carlots, contr., net ton	\$142.50	Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome	\$4.00c	Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb.	\$2.60
				Do., spot	\$9.00c	Do., 100-200 lb. lots	2.75
				88% chrome, contract	\$3.00c	Do., under 100-lb. lots	3.00
				Do., spot	\$8.00c	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant	80.00c

Sheets, Strip

Sheet & Strip Prices, Pages 86, 87

Pittsburgh—Miscellaneous buying is somewhat better and is the principal feature of the current market. Domestic manufacturers of a wide variety of products are buying in fairly good quantity. Automotive releases also are in slightly better volume. Prices are firm, full market quotations applying. Export business also remains fairly steady. Operations are between 75 and 80 per cent of capacity, with galvanized sheet production up one point last week to 77 per cent.

Cleveland—A new contract cannot attain delivery within 60 to 90 days, the tendency being constantly to extend the period. Despite the fact that heavy steels are regarded as chief defense materials demand for sheets and strip continues active. September orders ran the same or a little less, as compared with August, depending on the producer.

Chicago—Sheets and strip are active, specifications buying being the best for some weeks. Difficulty in obtaining an adequate supply of sheet bars is restricting rolling schedules. Sellers are receiving unsolicited orders for strip from numerous companies not heretofore buyers of this product. This is explained in that these buyers are accepting contracts for national defense for products foreign to their normal line of manufacture.

Boston—With defense contracts a more indirect factor, cold strip buying has registered additional improvement. Automotive releases, notably by partsmakers, however, are more in evidence with consumers in that field striving to build up stocks.

Philadelphia—Sheet and strip orders are increasing following heavy shipments against low-priced spring contracts. Fairly early deliveries were available recently but shipments now are backing up slowly, some producers asking five to six weeks on hot and cold-rolled. Consumption is at a rate expected to reduce excess inventories. The navy has distributed orders for more than 6000 tons of sheets and strips, 5266 tons going to Carnegie-Illinois Steel Corp.

New York—Cold-rolled strip mills as a rule are well filled for high fourth quarter production. In an effort to build up inventories, releases by the automotive trade are materially heavier. Increased forward buying and coverage by more consumers is placing scattered orders on books for first quarter shipment at open prices. Beginning to benefit to a greater degree from defense

contracts, mills are figuring on about 4500 tons of high carbon strip for machine gun belt links, 1500 tons being bought.

Notwithstanding the heavy movement of sheets last month against contracts placed at concessions a while ago, leading sellers report substantial new buying, principally for delivery late in the quarter and during the early part of the first quarter of next year on the basis in the latter case of prices ruling at time of shipment.

Cincinnati—Sheet bookings in the last week represented full mill capacity. Shipments are fairly prompt although backlogs tend to grow. Automotive needs, credited with a major share in the recent expansion, continue heavy.

Buffalo—With consumers pressing

for delivery, sheet and strip shipments in September were around the best monthly tonnage figures on record here. Mills, however, were unable to reduce delivery delay. Automotive consumers are active buyers and inquiries for defense purposes continue to increase.

St. Louis—Despite large shipments of sheets and strip, producer backlogs continue to expand, and deliveries on several items are further extended. Strip releases are considerably freer, with some customers urging quick shipment. Prices are firm.

Birmingham, Ala.—Sheets, while not showing perceptible increase in demand, are holding the pace of the past few weeks. Output is approximately 85 per cent, and considerable backlog is in evidence.

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Not a great deal of strip is being produced.

Toronto, Ont.—Inquiries on a much broader scale have appeared and Canadian mills again pushed forward delivery dates toward the latter part of first quarter. The automotive industry is placing large orders and these will be further increased to provide materials for war orders closed during the week totaling upwards of \$10,000,000.

Plates

Plate Prices, Page 86

Pittsburgh — Inquiries continue heavy and bookings are greater than deliveries. Backlogs continue to increase. Heavy inquiries for armor plate are coming in from all sides and much of this is expected to be converted into orders before the first of the year.

Cleveland — Increases in orders have been much less pronounced than in other heavy steels, such as bars. September sales for railroad consumption merely held their own with August.

Chicago—The past week has been one of the best this year for heavy plates, demand coming principally from tank fabricators and railroad car builders. Several orders from the latter were booked by mills this week. Deliveries are becoming tighter as backlogs build up and mills experience difficulty in obtaining semifinished steel.

Boston—With prospects for further contracts for smaller craft, demand for plates is broadening to cover shipyards which have been less active than builders of larger ships. Tonnage releases for shipbuilding are maintained and buying in less-than-car lots for prompt delivery is steady, with more volume being turned to warehouses, with delivery a factor.

New York—Some spurt has been noted in demand for steel for Japan, recent inquiries including 10,000 tons of sheet bars and 8000 tons of plates. Plate demand is livelier, from railroad equipment builders, structural fabricators and armament manufacturers.

Philadelphia — Plate orders not identified with defense projects are more numerous, following a previous lag. South American inquiry is more active. Japan is also in the market but for several reasons producers are not anxious to accept this business. About 10,000 tons of rolled steel, mainly plates, is pending for 1000 hopper cars the Reading will build in its own shops. Navy has placed 70,000 tons of plates for various requirements for the next six months, 43,880 tons with Carne-

gie-Illinois Steel Corp., 18,429 tons with Worth Steel Co. and 7486 tons with Lukens Steel Co.

Birmingham, Ala.—Plates are accumulating a substantial backlog. Production is being pushed to the limit of capacity on miscellaneous demand from car and ship builders, tank manufacturers and others, and some pressure for delivery is being exerted.

San Francisco—Prospects in the plate market are encouraging and some heavy tonnages in connection with dams are expected to be released for figures before the end of the year.

Toronto, Ont.—With the Canadian government adding to its ship construction program, demand for plate is gaining in volume with large orders overhanging the market. Demand for plate for ordinary domestic needs also is improving and consumers are said to be experiencing more difficulty in obtaining prompt, or even short term, delivery.

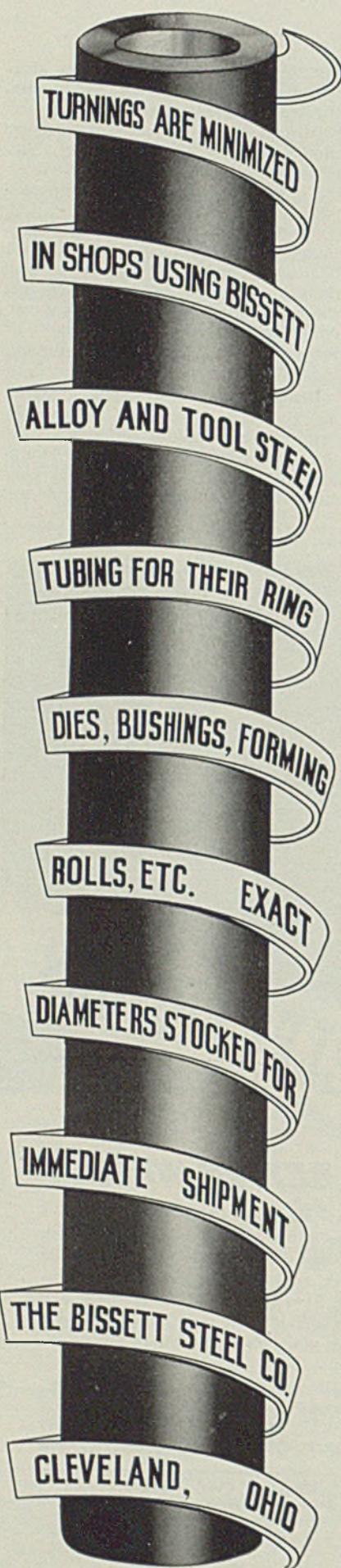
Baltimore — Despite substantial tonnage of plates being consumed, deliveries temporarily at least are not as tight as early in the summer, due mainly to the fact that buyers have now accumulated a fair backlog. Deliveries are available to regular customers in 10 days to two weeks on lighter sizes and three to four weeks on heavier, except on wide widths. In the latter case, shipments generally range from five to eight weeks.

Plate Contracts Placed

- 97,278 tons, plates, shapes, bars, sheets and strip, mostly plates; bureau of supplies and accounts, navy department, schedule 3224, bids Sept. 20, Washington distributed as follows: Carnegie-Illinois Steel Corp., Pittsburgh, 69,646 tons, including 42,880 tons, plates; 4887 tons, strip; 14,653 tons, bars, and 379 tons, shapes; Worth Steel Co., Conshohocken, Pa., 18,429 tons, plates; Lukens Steel Co., Coatesville, Pa., 8434 tons, plates; 7486 tons, sheets; 98 tons, strip; Jones & Laughlin Steel Corp., Pittsburgh, 769 tons, bars and strip.
- 6000 tons, three C-2 type cargo vessels, maritime commission, to Moore Drydock Co., Oakland, Calif.
- 1820 tons, floating drydock, specification 9950 for navy, to Pacific Bridge Co., San Francisco.
- 600 tons, coast geodetic survey boat, to Lake Washington Shipyard, Houghton, Wash.
- 400 tons, estimated, four welded steel tanks, Panama, M. W. Kellogg Co., Jersey City, bids Oct. 1, at Washington.
- 210 tons, steel discharge pipe, U. S. engineer, Fort Mifflin, Pa., to Phoenix Bridge Co., Phoenixville, Pa.
- 155 tons, 10 tanks, 24 x 24 feet, Gulf Oil Corp., Port Arthur, Tex., to Petroleum Iron Works, Sharon, Pa.
- 150 tons, inlet pipes, specification 1415-D, Boulder dam, Boulder City, Nev., to Consolidated Steel Corp., Los Angeles.

Plate Contracts Pending

- 4900 tons, ten seaplane tenders for west



coast; bids postponed from Sept. 25 to Oct. 16.
900 tons, (including shapes) coast and geodetic survey steamer; Lake Washington Shipyards, Seattle, general contractor.
700 tons, navy power barge; Associated Shipbuilders, Seattle, general contractor.
400 tons, two 500,000-gallon elevated steel tanks, riveted construction, schedule 4404; bids Oct. 17, Washington.
125 tons, 51 1/2-inch water pipe, Seattle; bids in.

Bars

Bar Prices, Page 86

Pittsburgh—Deliveries are beginning to slow somewhat in certain grades of merchant bars, although on the whole the situation is much better than in the heavier products. Export business is steady. Prices are firm in all sections.

Cleveland—A large variety of miscellaneous orders is placing a satisfactory aggregate on books. Sales volume of September was considerably better than in August and October prospects seem even better. With prompt deliveries out of the question consumers are carrying larger stocks at their own plants, particularly in standard sizes and qualities. Prices are among the firmest on the steel list.

Chicago—Sales of both carbon and alloy bars picked up last week in spite of slow business from automotive interests. Emphasis at the moment is on tractor and farm implement requirements. Forging shops continue extremely active and are booked for six to eight weeks. Deliveries on carbon bars remain at two to three weeks, while alloy are extended a fortnight to five to six weeks.

Boston—Orders for carbon steel and alloy bars are appearing in good volume despite substantial coverage by numerous consumers and secondary distributors, who are pressing for deliveries on alloy and special treated stock especially. On the whole, however, buying is off somewhat, due to anticipation of requirements by some larger regular users. Specifications are maintained, with consumption broadening, yet a large volume remains to be bought for defense program material contracts, small arms and other armaments.

New York—Although some fairly early deliveries are still available on some sizes, the general schedule of shipments on plain carbon bars is becoming more extended, ranging from four to seven weeks. Cold-finished bars range around six or seven weeks where the processors have to first place orders with the

mills; where they have material in stock, ready to be finished, deliveries within three weeks are available.

Philadelphia—Mill shipments of bars are still unable to match demand, orders being enlarged by increasing purchases of small lots by miscellaneous users. Defense work continues to be identified with a growing share of bar business, including 10,000 tons said to have been placed by Edward G. Budd Mfg. Co. for demolition bombs. An inquiry for 75,000 tons of billets by a local company for British shell manufacture is reported shelved but another inquiry for 2500 tons is still pending.

Birmingham, Ala.—Bars are moving in considerable quantity, a great proportion of the output being concrete reinforcing, although merchant bars are in good demand. Production is approaching 90 per cent.

Buffalo—With buying exceeding shipments, mills report steel bar deliveries are being extended about six weeks. Orders requiring special rolls for tool materials are delayed a month as production is centered on more popular grades.

Toronto, Ont.—Bar buying is increasing and consumers are booking further ahead. Mills, however, are

giving delivery on some orders in six weeks to two months and report no extraordinary pressure.

Baltimore—Commercial bar deliveries cover a wide spread, depending upon sizes. In some instances two weeks can still be done but this is exceptional and four to six weeks appears to be about the average.

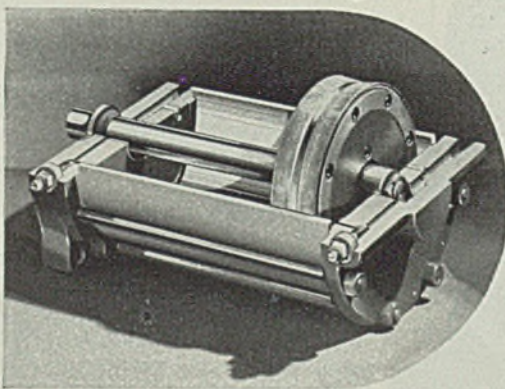
Pipe

Pipe Prices, Page 87

Pittsburgh—Little change is reported in tubular goods. Oil country business is somewhat slower and it is probable that October shipments will run behind September. Miscellaneous buying in mechanical tubing has been good. Automotive releases also are somewhat better and aircraft tonnage backlogs are high. Standard pipe demand is still the prime mover of the current market, with construction needs heavy in all sections.

Cleveland—September proved a good month for sales of merchant steel pipe line and casing pipe. Inquiry continues brisk and October prospects are excellent. Though

adjustable "cushioned" air cylinder strokes



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price shading has been complained of in recent weeks producers believe that this situation will soon be remedied in view of the better condition of order books. Several pipe line projects which have been outstanding from six months to a year still pend and will provide large tonnages, if placed.

Boston—Slight improvement in merchant steel pipe buying is due to better demand for building construction, heating-plumbing contracts and expansion of facilities at cantonments and army housing. Outlook for multiple housing project requirements is also encouraging, although actual orders may not be forthcoming before late in the year. Plumbing supply distributors have built up stocks moderately.

Birmingham, Ala.—Pipe plants are holding to the five day schedule, with a fairly heavy tonnage booked, a large part of it from government sources, and some additional West Coast and scattered business. Inquiries are somewhat more numerous.

San Francisco—The second largest cast iron pipe inquiry of the year has just come out for figures and bids will be opened Oct. 7 for 2500 tons of 6 to 12-inch pipe for Los Angeles. Awards were confined to

lots of less than 100 tons and to date 33,201 tons have been booked as compared with 28,348 tons for the corresponding period in 1939.

Baltimore—Close to 600 tons of merchant pipe will be required for the cantonment at Fort Bragg, N. C., under plans which will triple the original scope of the program there. T. A. Loving, Goldsboro, N. C., is the general contractor.

Steel Pipe Placed

Unstated tonnage, 12,000 feet 14-inch spiral welded steel pipe and fittings, for Tennessee valley authority, at Columbia, Tenn., to Naylor Pipe Co., Chicago; bids Sept. 20.

Cast Pipe Placed

260 tons, various sizes, sewage treatment plant, Cranston, R. I., to R. D. Wood & Co., Philadelphia; James A. Monroe & Sons, North Attleboro, Mass., contractor.

Cast Pipe Pending

2500 tons, 6 to 12-inch, specification 3530, Los Angeles; bids Oct. 7.

640 tons, 24-inch cast pipe, with alternate on steel, Washington; bids Oct. 11, district commissioners.

500 tons, 6 to 12-inch, class 150, metropolitan district commission; bids in.

300 tons, 14-inch, Fort Lewis, Wash.; bids in.

298 tons, 6 and 8-inch, San Francisco;

United States Pipe & Foundry Co., Burlington, N. J., low.

250 tons, 6-inch, Bernardston, Mass.; bids in.

240 tons, 6 and 8-inch, Hill, N. H.; bids in.

200 tons or more, local improvements, Seattle; bids in about 30 days.

200 tons, 12 and 14 inch, Sumner, Wash.; allocation approved, bids soon.

Rails, Cars

Track Material Prices, Page 87

Placing of 1000 wagontop box cars by Baltimore & Ohio with its own shops is outstanding in the eastern car market. The underframes and trucks will be supplied by Bethlehem Steel Co. Domestic freight car awards during September involved 9735 units, and brought the total for the first nine months up to 39,297, against 35,456 in the corresponding period of last year, 9953 in the same period of 1938 and 49,706 in the same period in 1937. Further comparisons follow:

	1940	1939	1938	1937
Jan.	360	3	25	17,806
Feb.	1,147	2,259	109	4,972
March....	3,104	800	680	8,155
April....	2,077	3,095	15	9,772
May.....	2,010	2,051	6,014	4,732
June....	7,475	1,324	1,178	548
July....	5,846	110	0	1,030
Aug....	7,525	2,814	182	1,475
Sept....	9,735	23,000	1,750	1,216
9 mos. ...	39,297	35,456	9,953	49,706
Oct.....		19,634	2,537	1,355
Nov.....		2,650	1,232	275
Dec.....		35	2,581	275
Total... ..		57,775	16,303	51,611

Locomotive buying includes ten diesel-electric switch engines by the Southern railway, with eight going to Electro-Motive Corp., La Grange, Ill., and two to the American Locomotive Co., New York.

Car Orders Placed

Baltimore Translt Co., 49 streamlined street cars, to Pullman-Standard Car Mfg. Co., Worcester, Mass.

Baltimore & Ohio, 1000 wagontop box cars, to own shops, trucks and underframes to be supplied by Bethlehem Steel Co., Bethlehem, Pa.; 1000 hoppers still pending.

Car Orders Pending

New York Central, 200 flat cars, bids asked.

St. Louis & Southwestern, 300 box cars; bids asked.

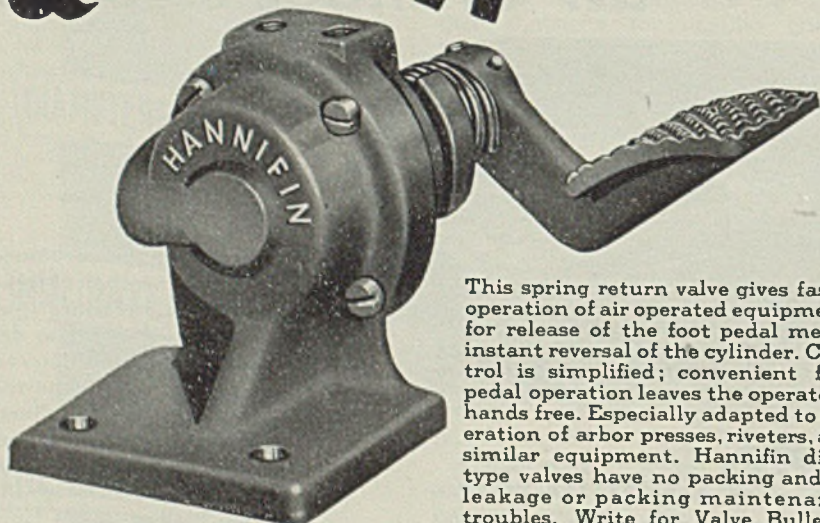
Wheeling & Lake Erie, 100 to 500 box cars, bids asked.

Locomotives Placed

Raritan arsenal, New Jersey, one 56-ton diesel-electric locomotive, to General Electric Co., Schenectady, N. Y.

Southern Railway, five 1000-horsepower and three 600-horsepower diesel-electric switching locomotives to Electro-Motive Corp., La Grange, Ill., and two 600 horsepower diesel-electric loco-

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Rail Orders Placed

Baltimore & Ohio, 16,500 tons, 11,500 to Carnegie-Illinois Steel Corp., Pittsburgh and 5000 tons to Bethlehem Steel Co., Bethlehem, Pa.

Wire

Wire Prices, Page 87

Chicago—Wire specifications continue heavy with consumers pushing for delivery. Demand is well diversified with national defense requirements prominent. Wire mills are operating below capacity, principally through inability to obtain billet stock. Deliveries range at about two weeks.

Boston—Incoming wire tonnage, heavier in spots, maintains mill backlogs. Unshipped bookings on some products are mounting, demand being well diversified with specifications for specialties sustained. Production is at capacity or bolstered by extra shifts in several departments, and schedules increasing in others. With substantial volume of business revolving around specialties requiring additional processing, mills will be hard pressed to ship all current quarter tonnage before the end of the year.

New York—Orders for wire products are more numerous, incoming tonnage precluding any reduction in aggregate backlogs with eastern mills operating at capacity in some departments. Shipments are heavy and demand well spread. With consumers generally seeking to cover well ahead, some business is being taken for delivery next quarter at open prices. Buyers connected with the automotive trade are specifying more actively and appear to be making efforts to build up inventories.

Birmingham, Ala.—All items in wire are showing some gain. Production is consistently near capacity and an accumulation of bookings is to be worked off.

Tin Plate

Tin Plate Prices, Page 86

No change is reported in tin plate markets, with operations around 40 per cent. Buying is practically absent and the prospects of any increase over the remainder of this year remote.

Metallurgical Coke

Coke Prices, Page 87

By-product coke prices are being advanced 50 cents per ton in practically all producing centers as possibility of short supplies is seen for

winter months. Foundry and domestic demand is increasing and recent advance in several grades of bituminous coal adds to cost of production.

Shapes

Structural Shape Prices, Page 86

Pittsburgh—Inquiries for shapes are heavy again this week. Mills are well loaded and backlogs high. Special sections and material for armament work have brought in a considerable number of inquiries recently, all of which must be rolled on structural mills.

Cleveland—Chief interest focuses on how much tonnage will be used in the shell loading plant at Ravenna, O., popular estimates being 5000 to 10,000 tons. There are reports that relaying rails are to be used at the plant, which may suggest that other forms of steel may be second-hand material. Inquiries and orders are rather light. Two Ohio highway bridge projects, slightly under 400 tons each, are typical of current business. Deliveries have been extended further to 60 to 90 days. Prices of fabricated structurals, erected, are reported unusually firm.

Chicago—Some improvement in shape orders is noted, although tonnages are small. The usual run of jobs is for small bridges, plant additions, and the like, involving less than 100 tons. Private and public construction involving steel piling is in good volume.

New York—Structural steel contracts, although including 15,000 tons for railroad grade crossing elimination, Rockaway Beach, N. Y., to Bethlehem Steel Co., are temporarily lower. Awards also include 5000 tons for the navy, but outstanding tonnages for defense construction, heavy of late, are fewer. Industrial plant expansions involve numerous medium-sized lots.

Philadelphia—Structural deliveries are lengthening, with five to six weeks generally the minimum de-

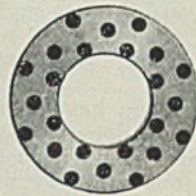
Shape Awards Compared

	Tons
Week ended Oct. 5	36,353
Week ended Sept. 28	91,266
Week ended Sept. 21	81,811
This week, 1939	25,063
Weekly average, year, 1940	26,351
Weekly average, 1939	22,411
Weekly average, Sept.	66,171
Total to date, 1939	910,586
Total to date, 1940	1,054,027

Includes awards of 100 tons or more.

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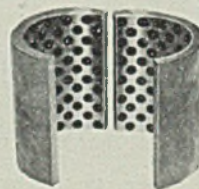
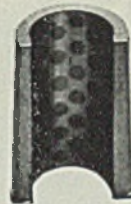
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spite heavier shipments. Producers see no prospect of an easier situation this quarter in view of heavy pending and proposed construction. Small industrial plant extensions continue numerous. Carnegie-Illinois Steel Corp. booked 14,653 tons on the navy's recent semiannual award.

Seattle—Fabricators have heavy backlogs and additional important contracts are pending, including about 1000 tons for navy projects. Howard S. Wright & Co., Seattle, has the general contract for a \$1,500,000 addition to the pulp plant of Puget Sound Pulp & Timber Co., Bellingham, Wash., involving both shapes and plates. Isaacson Iron Co., Seattle, will furnish between 400 and 500 tons of shapes for this project.

San Francisco—While structural awards were not large over 28,000 tons are pending. Bids have been postponed of 1650 tons for ten seaplane tenders for use on the west coast from Sept. 25 to Oct. 16.

St. Louis, Oct. 3. — Except for one large pending project, structural lettings are small and not numerous. The pending work is a bridge over the Mississippi river in St. Louis county, requiring 7000 tons of shapes, bids for which will be asked within 30 days.

Shape Contracts Placed

- 15,000 tons, viaduct grade crossing project, contract 5, Long Island railroad, Rockaway Beach, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Charles F. Vachris Co., New York, contractor, bids Sept. 26.
- 1800 tons, aircraft engine plant, Packard Motor Car Co., Detroit, to R. C. Mahon Co. Inc., Detroit.
- 1700 tons, aviation facilities, Miami (Opa Locka), Florida, 1500 tons to Virginia Bridge Co., Roanoke, Va., 200 tons to Aetna Iron & Steel Co., Jacksonville, Fla.; Fred Howland Inc., Miami, Fla., contractor.
- 1350 tons, 18 warehouses, Edgewater arsenal, Maryland, to Bethlehem Steel Co., Bethlehem, Pa.; Cummins Construction Co., Baltimore, contractor.
- 950 tons, radio transmitter building, General Electric Realty Co., Schenectady, N. Y., to Ingalls Iron Works, Birmingham.
- 780 tons, floating drydock, specification 9950, to Pacific Bridge Co., San Francisco.
- 700 tons, paper mill buildings for St. Mary's Kraft Corp., St. Mary's, Ga., to Virginia Bridge Co., through Morton C. Tuttle Co., Boston, with George F. Hardy, N. Y. engineer.
- 660 tons, three-bay plant extension for Curtiss-Wright Corp., Caldwell, N. J., to Harris Structural Co.

- 625 tons, steel sheet piling, Bonneville powerhouse foundations, to Bethlehem Steel Co., Seattle.
- 520 tons, bridge SAP-663-A, Ellis county, Oklahoma, to Capitol Steel & Iron Co., Oklahoma City; Mills Construction Co., Woodward, Okla., contractor.
- 510 tons, boiler supports, powder plant, government project to be operated by duPont interests, Charlestown, Ind., to American Bridge Co., through Combustion Engineering Co., New York.
- 500 tons, warehouse and factory addition, Union Drawn Steel division, Republic Steel Corp., bids Aug. 31, to Joseph T. Ryerson & Son Inc., Chicago.
- 500 tons, motor and shipping building, Wright Aeronautical Corp., Paterson, N. J., to International Steel Co., Evansville, Ind.; Mahony-Troast Construction Co., Passaic, N. J., contractor.
- 480 tons, warehouse and office building, for Federal Enameling & Stamping Co., McKees Rocks, Pa., to Bethlehem Steel Co., Bethlehem, Pa.
- 476 tons, extrusion plant, Reynolds Metals Co., Louisville, Ky., to International Steel Co., Evansville, Ind.
- 450 tons, Montana state highway bridge, Glacier Park, Mont., bids Sept. 27, to Missouri Valley Bridge & Iron Co., St. Louis.
- 450 tons, two air corps hangars, Chanute field, Rantoul, Ill., to Bethlehem Steel Co., Bethlehem, Pa.; Manhattan Construction Co., Muskogee, Okla., contractor; bars awarded same fabricator.
- 425 tons, printing department building, Westinghouse Electric & Mfg. Co., Trafford, Pa., to Keystone Engineering Co., Pittsburgh.
- 420 tons, engine overhaul building, naval air base, Pensacola, Fla., to Jones & Laughlin Steel Corp., Pittsburgh.
- 410 tons, buildings, Dow Chemical Co., Dow, Tex., to Mosher Steel Co., Dallas, Tex.; Austin Co., Cleveland, contractor.
- 400 to 500 tons, plant addition, Puget Sound Pulp & Timber Co., Bellingham, Wash., to Isaacson Iron Works, Seattle.
- 400 tons, coast geodetic survey boat, Seattle, to Lake Washington Shipyards, Houghton, Wash.
- 400 tons, bridge crane, United States navy, bureau of yards and docks, Mare Island, Calif., bids Sept. 11, to Harnischfeger Corp., Milwaukee.
- 360 tons, service barge, St. Louis, bids Sept. 17, to Ingalls Iron Works Co., Birmingham, Ala.
- 350 tons, overhead crossing FAP-286-A (4), Wyndmere, N. Dak., for state, to Bethlehem Steel Co., Bethlehem, Pa.
- 340 tons, extension to furnace building, for New Jersey Zinc Co., Palmerton, Pa., to Belmont Iron Works, Philadelphia.
- 310 tons, copper shop, New York Shipbuilding Corp., Camden, N. J., to Lehigh Structural Steel Co., Allentown, Pa.
- 300 tons, weld shop, Harvey-Whiting Corp., Harvey, Ill., to Wendnagel & Co., Chicago.
- 270 tons, bridge, route 187-385, Allegheny county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.
- 260 tons, psychiatric unit, state hospital,

- Weston, W. Va., to Parkersburg Rig & Reel Co., Parkersburg, W. Va.
- 240 tons, bridge FAS-76-A, Tillman county, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City.
- 230 tons, addition to building, for C. A. Reed Co., Williamsport, Pa., to Weatherly Steel Co., Weatherly, Pa.
- 195 tons, building for St. Lukes hospital, Bethlehem, Pa., to Bethlehem Contracting Co., Bethlehem, through Hegeman-Harris Co., New York.
- 180 tons, Ak-Sar-Ben viaduct, FAGH-35-B (1), Omaha, Nebr., to Omaha Steel Works, Omaha, Nebr.
- 165 tons, building for Union Industries, Inc., Stamford, Conn., to Dreier Co.
- 150 tons, floodlight towers, various deliveries, Chesapeake & Ohio railroad, to International Steel Co., Evansville, Ind.
- 150 tons, building for Continental Can Co., Passaic, N. J., to Bethlehem Steel, through Austin Co., Cleveland.
- 150 tons, shaft, metropolitan district commission, Boston, Webster, Mass., to Groisser & Shlager Iron Works, Boston.
- 140 tons, state bridge GR-68-143, Xenia, O., to Burger Iron Co., Akron, O.
- 139 tons, Illinois Central railroad bridge, Council, Ill., to Bethlehem Steel Co., Bethlehem, Pa.
- 135 tons, county jail, Elmira, N. Y., to American Bridge Co., Pittsburgh.
- 123 tons, steel piling, Contractors Machinery Co., Kansas City, Mo., to Bethlehem Steel Co., Bethlehem, Pa.
- 120 tons, bridge, route 443, Lehigh county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.
- 110 tons, state bridge PSC-5341, Stanley, N. Y., to Genesee Bridge Co., Rochester, N. Y.
- 110 tons, power plant addition, navy yard, Boston, to Bethlehem Fabricators Inc., Bethlehem, Pa.
- 110 tons, bridge FA-110-A, St. Clair county, Illinois, to Missouri Bridge & Iron Co., St. Louis.
- 100 tons, state bridges, Rangeley and Byron, Me., to Bethlehem Steel Co., Bethlehem, Pa.; Hector J. Cyr Co. Inc., Waterville, Me., contractor.
- 100 tons, Valentine hall, Amherst college, Amherst, Mass., to Haarman Steel Co., Holyoke, Mass.; E. J. Pinney & Co. Inc., Springfield, Mass., contractor.
- 100 tons, plant addition, Carborundum Co., Niagara Falls, N. Y., to Lackawanna Steel Construction Co., Buffalo.
- 100 tons, plant addition, Morrison Steel Products Inc., Buffalo, to R. S. McMannus Steel Construction Co., Buffalo.
- 100 tons, 2-story building, Boys' club, South Boston, Mass., to West End Iron Works, Cambridge, Mass.; William M. Bailey Co., Boston, contractor.
- 100 tons or more, housing project, Waco, Tex., to Central Texas Iron Works, Waco; H. E. White, Tyler, Tex., contractor.
- 100 tons, shapes and bars, head house, contract 84, shaft 4, Southboro, Mass., tunnel, Metropolitan District Commission, Boston, to West End Iron Works, Boston, and Truscon Steel Co., Youngstown, O.; John F. Griffin Co., Cambridge, contractor.

Shape Contracts Pending

- 10,000 tons, plant expansion, Glenn Martin Co., Baltimore, inquiry expected within fortnight.
- 7000 tons, Clayton, Mo., bridge over Mississippi river in St. Louis county; bids asked in 30 days; Sverdrup & Parcel, St. Louis, engineers.
- 5000 tons, Edgewood arsenal, Maryland,

—The Market Week—

contemplated under further expansion program, on which inquiries are expected out over next few weeks; Cummins Construction Corp., Baltimore, contractor.

2600 tons, warehouses, Arsenal, Utah, for government.

2200 tons, Atlantic avenue subway, Georgia-Schenk avenues, Brooklyn, N. Y., for Long Island railroad.

2000 tons, additions, naval ammunition depot, Hawthorne, Nev.; Wm. P. Nell Co., 4884 Loma Vista, Los Angeles, low on general contract at \$2,126,000.

1700 tons, state highway bridge, Harpers Ferry, Md., specifications out shortly.

1650 tons, ten seaplane tenders for west coast; bids postponed from Sept. 25 to Oct. 16.

1500 tons, seaplane hangar, Alameda, Calif., for navy.

1500 tons, assembly plant, Bell Aircraft Corp., Niagara Falls, N. Y.; Austin Construction Co., Cleveland, low.

1300 tons, 11 Pennsylvania state bridges; bids to Harrisburg, Pa., Oct. 11.

1200 tons, assembly and office building, for Packard Motor Car Co., Detroit.

850 tons, Little Emory bridge, Harriman, Tenn., for Tennessee Valley authority, Knoxville, Tenn.

800 tons, operations hangar, Fort Knox, Ky., for war department.

775 tons, nine ammunition magazines, Edgewood, Md., for army.

700 tons, mill building, for Reynolds Metals Co., Louisville, Ky.

650 tons, bridge, Los Angeles Junction railway, Los Angeles, for army engineers.

550 tons, Evans Memorial hospital building, for Massachusetts Memorial hospital, Boston.

500 tons, manufacturing building, for Celanese Corp. of America, Amcelle, Md.

450 tons, underpass, Touhy avenue, Park Ridge, Ill., for state.

440 tons, bridge over Otter river, Royalston, Mass., for Boston & Maine railroad.

400 tons, building for war department, Ogden, Utah; bids Oct. 18.

388 tons, Ohio state highway bridge, Trumbull county, beam spans; bids Oct. 19.

387 tons, Ohio state highway bridge, Cuyahoga county; bids Oct. 19.

350 tons, military residence, Little Compton, R. I., for army engineers.

300 tons, steel wales, Quonset Point, R. I., for navy.

300 tons, factory and office building, Bastian-Blessing Co., Chicago.

280 tons, spillway bridge, stage 1B construction, Kentucky dam, bids Oct. 16, Tennessee valley authority, Knoxville, Tenn.

265 tons, retail market buildings, department of public works, Brooklyn and Bronx, N. Y.; bids Oct. 8.

265 tons, truss bridge, Tioga county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 11.

260 tons, airport, Stockton, Calif.; Judson-Pacille Co., San Francisco, low.

250 tons, highway bridge, PSC 5998, Orchard Park, N. Y.; Bero Engineering & Construction Co., Tonowanda, N. Y.; contractor.

250 tons, highway bridge, Macedon, N. Y., PSC 8451; Mohawk Paving Co., Buffalo, contractor.

250 tons, auditorium, George Washington university, Washington, Charles H. Tompkins, Washington, general contractor.

235 tons, two structures, McKean county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 11.

225 tons, truss bridge, Lycoming county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 11.

220 tons, office building, for Detroit Edison Co., Port Huron, Mich.

200 tons, state bridge FAGH-98-C (3), Crete, Nebr.

160 tons (including 40 tons reinforcing) Washington state bridge, Snohomish county; David Nygren, Seattle, general contractor.

155 tons, two I-beam bridges, Berks county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 11.

150 tons, storage garage, for Boston Elevated railway, Boston.

140 tons, machine shop, for J. L. Lucas & Sons Inc., Fairfield, Conn.

130 tons, state bridge over Tymochtee creek, Wyandot county, Ohio.

124 tons, highway work, Greenlee county, Ariz., for state; bids Oct. 11.

120 tons, state bridge over Deer creek, Madison county, Ohio.

115 tons, I-beam bridge, Clearfield county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 11.

110 tons, central heating plant, Jeffersonville, Ind., for war department.

105 tons, platforms and miscellaneous material, for Toledo Edison Co., Toledo, O.

105 tons, three I-beam bridges, Washington county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 11.

Unstated, 150-ton capacity crane for Coulee dam; Star Iron & Steel Co., Tacoma, general contractor.

Unstated, lock gate machinery; bids in to United States engineer, Bonneville, Wash.

Unstated, branch exchange building for Pacific Telephone & Telegraph Co., Seattle; bids soon.

Reinforcing

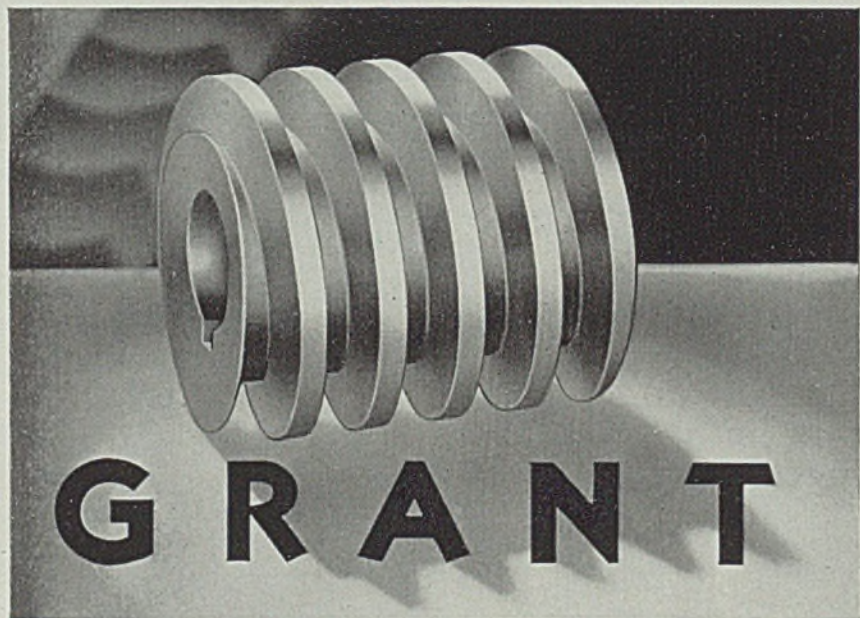
Reinforcing Bar Prices, Page 87

Cleveland—Large producers found sales in September 40 per cent larger than in August which had been the same percentage increase of August over July. Inquiries so far in October are also better. Prices are described as not yet firm, but better.

Chicago—Reinforcing steel continues active, but orders range at 100 tons or less and are well scattered, with competition keen. Largest award the past week involved 2200 tons.

New York—Reinforcing steel purchases include 1700 tons for Long Island grade crossing needs and a fair sprinkling of smaller lots. Inquiry is maintained and includes 300 tons for a bulkhead wall, New York, with 700 tons of steel sheet piling.

Seattle—The market is active,



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small tonnages predominating. Rolling mills have good backlogs and operating steadily at about 75 per cent. Merchant bars are in good demand both for jobbers and construction projects. Prices are firm.

Baltimore—Award of 3000 tons for further expansion at the plant of the Glenn L. Martin Co., which has recently booked an \$88,000,000 airplane contract, is outstanding. Other awards involve small lots of 100 tons

and less. Considerable small miscellaneous business is being figured, chiefly industrial work, and including about 100 tons for further additions at the Edgewood arsenal, Maryland.

Reinforcing Steel Awards

- 7000 tons, powerhouse units 7 to 10, Bonneville dam, Oregon, to Bethlehem Steel Co., Seattle, Wash.
- 3000 tons, plant expansion, Glenn L.

- Martin Co., Baltimore, to Truscon Steel Co., Youngstown, O.
- 2200 tons, S. James Herman Gardens housing project, Detroit, A. Smith & Lipman Construction Co., Detroit, contractor, to Calumet Steel Co., Chicago.
- 1850 tons, including mesh, grade crossing elimination, contract 5, Long Island railroad, Rockaway Beach, New York, to Bethlehem Steel Co., Bethlehem, Pa., through Charles F. Vachris Co., New York.
- 480 tons, sewage treatment plant, Cranston, R. I., to Truscon Steel Co., Youngstown, O.; James A. Monroe & Sons, North Attleboro, Mass., contractor.
- 360 tons, Marshall Court housing, Newport News, Va., to Bethlehem Steel Co., Bethlehem, Pa., through Virginia Steel Co.; Loftis Bros., contractor.
- 350 tons, veterans administration building, Perry Point, Md., to Sweet's Steel Co., Williamsport, Pa.; J. D. Hedin Construction Co., contractor.
- 340 tons, Harbor Homes housing, Newport News, Va., to Bethlehem Steel Co., Bethlehem, Pa., through Virginia Steel Co.; Woodcrest & Rosoff Co., contractor.
- 309 tons, motor and shipping building, Wright Aeronautical Corp., Paterson, N. J., to Truscon Steel Co., Youngstown, O.; Mahony-Troast Construction Co., Passaic, N. J., contractor.
- 250 tons, aviation facilities, Miami, Florida, to Paul E. Shipe, Miami, and Southern General Fireproof Co., Atlanta (from stock); Fred Howland, Inc., Miami, contractor.
- 246 tons, bureau of reclamation, invitation A-46938-A, Rutledge, Texas, to Sheffield Steel Corp., Kansas City, Mo.
- 210 tons, Woodrow Wilson high school, New York, to Carroll & McCreedy Co. Inc., Brooklyn, N. Y., through Psaty & Fuhrman Inc., New York.
- 180 tons, route 187 and R 395, Allegheny county, Pennsylvania, to Truscon Steel Co., Youngstown, O.; Laub & Collins, contractor.
- 175 tons, bars and mesh, additional buildings, Camp Edwards, Falmouth, Mass., to Concrete Steel Co., Boston; Walsh Construction Co., New York, contractor.
- 153 tons, Indiana highway project R-2025, Grace Construction & Supply Co., contractor, to Bethlehem Steel Co., Bethlehem, Pa.
- 150 tons, mesh, state highway project RC-40-74, Fulton county, New York, to Wickwire-Spencer Steel Co., New York; Oneglia & Gervasin, Inc., Torrington, Conn., contractor, \$349,266.75.
- 145 tons, normal school, Bellingham, Wash., to Bethlehem Steel Co., Seattle.
- 135 tons, federal highway project, Natchez, Miss., to Laclede Steel Co., St. Louis.
- 130 tons, Bell Telephone Co., building.

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Concrete Bars Compared

	Tons
Week ended Oct. 5	18,191
Week ended Sept. 28	18,674
Week ended Sept. 21	9,897
This week, 1939	12,054
Weekly average, year, 1940	9,603
Weekly average, 1939	9,197
Weekly average, Sept.	10,611
Total to date, 1939	390,458
Total to date, 1940	384,138

Includes awards of 100 tons or more.

Pig Iron

Pig Iron Prices, Page 88

Pittsburgh — Production during September dropped slightly below August, due principally to fewer working days. October tonnage is expected to pick up again and in all probability will be higher. Pig iron and scrap trade deals between producers continue to hold the spotlight.

Chicago—Releases against pig iron

orders are increasing and additional fourth quarter orders are being taken in good volume. Foundry melts are considerably better than a month ago and where possible foundries are building up inventories. Prices are firm. Shipments of foundry coke also are increasing and further improvement is expected in October.

Cleveland — Recent further advances in steel scrap prices, which in a few cases have made scrap dearer than basic pig iron, have intensi-

- Aiton, Ill., to Laclede Steel Co., St. Louis.
- 118 tons, wire mesh, specification 344, metropolitan water district, Los Angeles, to Soule Steel Co., Los Angeles.
- 110 tons, additional buildings, Pocatunny, N. J., arsenal to Truscon Steel Co., Youngstown, O.
- 100 tons, laboratory, Johns-Hopkins university, Baltimore, to Concrete Steel Co., Baltimore.
- 100 tons, medical school building, Carlisle barracks, Carlisle, Pa., to Concrete Steel Co., New York; H. A. Williams, Allentown, Pa., contractor.
- 100 tons, building, Boys' Club, South Boston, Mass., to Truscon Steel Co., Youngstown, O.; William M. Bally Co., Boston, contractor.
- Unstated tonnage, steel wire mesh, hospital buildings, Camp Custer, Mich., to American Steel & Wire Co., Cleveland; Owen-Ames-Kimball Co., Grand Rapids, Mich., contractor.

Reinforcing Steel Pending

- 2000 tons, Ford aircraft engine plant, Detroit.
- 1377 tons, including 250 tons wire mesh, additions, naval ammunition depot, Hawthorne, Nev.; Wm. P. Neil Co., 4884 Loma Vista, Los Angeles, low on general contract at \$2,126,000.
- 975 tons, two storehouses, invitation 10034, naval fleet supply depot, Oakland, Calif.; N. P. Severin Co., 222 West Adams street, Chicago, low on general contract at \$559,623.
- 710 tons, federal housing project in Cincinnati; bids in.
- 500 tons, contract 5, section 6, Long Island railroad, Brooklyn, N. Y.
- 500 tons, contract 6, grade crossing, Long Island railroad, Atlantic avenue, Brooklyn; bids Oct. 8; also 3200 feet precast piles and small tonnage welded steel trusses.
- 480 tons, for Chevrolet Motor Co., Flint, Mich.
- 430 tons, power house, Port Washington, Wis.
- 400 tons, W. Rich street housing, Columbus, O.; bids Oct. 1.
- 400 tons, machine gun factory, Frigidaire division, General Motors Corp., Dayton, O.
- 400 tons, Merrimack Park housing, Norfolk, Va.
- 300 tons, contract 33, East River drive, New York.
- 300 tons, contract 33, bulkhead wall, Marginal street, Thirty-sixth to Forty-first streets, New York, bids Oct. 10 to President, Borough of Manhattan; also 700 tons, steel sheet piling.
- 200 tons, school buildings, St. Rose convent, Lacrosse, Wis.; Peter Nelson & Son, Lacrosse, contractor; 47 tons already bought from Truscon Steel Co., Youngstown, O.
- 170 tons, bridge, Greenlee county, Ariz., for state; bids Oct. 11.
- 150 tons, building, Coca Cola Co., Oshkosh, Wis.
- 150 tons or more, service building for Seattle Transportation Commission; Gjarde Construction Co., Seattle, low.
- 135 tons, shop building, Consolidated Machine Tool Co., Rochester, N. Y.
- 130 tons, Wilbur Cross parkway, Orange, Conn.
- 120 tons, highway project SH364, Jackson county, Ohio.
- 110 tons, housing project, Rock Island, Ill.; bids Oct. 1.
- 100 tons, Edgewood arsenal, Maryland, contemplated.
- 100 tons or more, addition to federal building, Anchorage, Alaska; L. B. James, Portland, general contractor.



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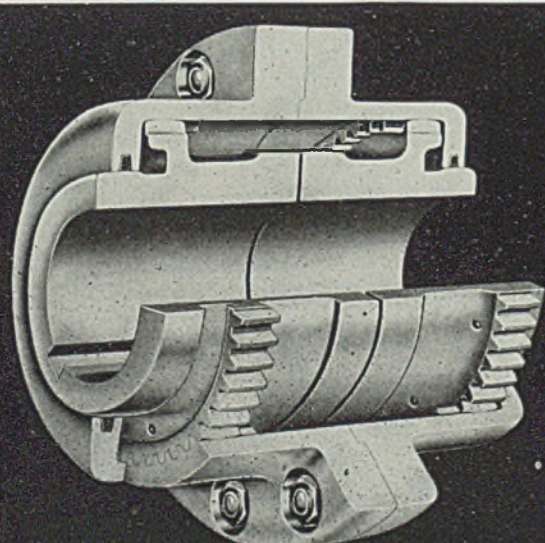
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fied buying of iron. During the past ten days considerable improvement in new business has been reported. Consumers have become more worried over future supplies and those financially able are anticipating needs as they have not done in ten years. Some producers will sell only to regular customers and to them somewhat sparingly.

New York—Some eastern pig iron

producers are shipping faster than iron is produced, drawing on stock piles. Foundries making machinery castings are especially active. Export tonnage is still moving, principally to Great Britain, though no recent orders have been reported.

Boston—Pig iron consumers have covered for fourth quarter generally and iron due on third quarter contracts has been taken in full by

most melters. Melt is gradually gaining, improvement in Connecticut being most notable since late September. Orders for castings indirectly connected with defense needs are more active and jobbing foundries are busier in several instances.

Philadelphia—Pig iron releases indicate further improvement in shipments this month. Buyers generally are covered through the quarter with some showing concern over future supplies by adding to stocks. Foundry operation is tending upward and pipemakers are busier.

Buffalo—Shipments for September were 10 to 20 per cent larger than August with the current movement at the best on record. Machinery and tool castings for defense have melters working six days a week. Heating equipment foundries have orders on hand for at least two months.

Cincinnati—Specifications for pig iron continue to show the volume which made September shipments the heaviest of the year. Most melters, despite expansion in demand for castings, are well covered but there is some increase in spot buying. By-product, foundry coke is up 50 cents, at \$11, delivered, Cincinnati. Shipments are heavy with supplies adequate so far.

St. Louis—September was by far the best so far this year in pig iron, both with reference to shipments and melt. Shipments are estimated to have exceeded those of August by 30 to 40 per cent. The melt has been steadily advancing since Labor Day, with virtually all industries participating in the improvement.

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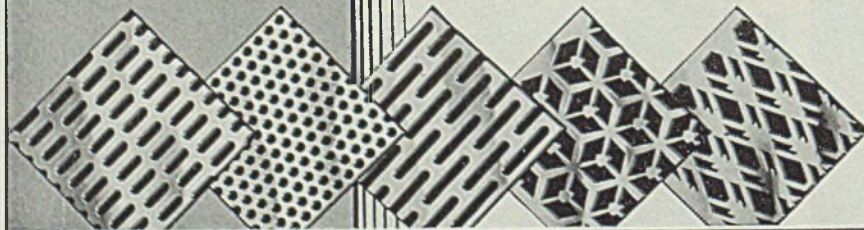
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Scrap

Scrap Prices, Page 90

Pittsburgh—Scrap shows no tendency to recede from the strong position it has held over the past few weeks, in spite of lack of buying on the part of district mills. Buyers report brokers are not particularly anxious to sell at current levels. Higher quotations are bringing out fair tonnage. Sales made over the past week, as well as broker offerings combined to increase quotation on No. 1 steel 50 cents to \$21.50 top.

Cleveland—Railroad lists brought out higher prices, especially for specialties. Advances of 50 cents on nearly all grades except cast iron products have been made here and in the Valley. Firmness is evident but melters hesitate to make tonnage purchases.

Chicago—Following two 50 cent advances in No. 1 heavy melting steel

a week ago, bringing the price to \$20 to \$20.50, the current price remains at these figures but is somewhat easier. Purchases of tonnages by two mills were responsible for the upward trend in prices. Several grades not affected in the earlier re-adjustment have advanced 50 to 75 cents a ton.

Boston — One and possibly two boats are expected to load for Japan at New England ports before the embargo on steel scrap becomes effective Oct. 15. No. 2 heavy melting steel and bundles will make up most of the last shipment. Any slack fol-

lowing stoppage of shipments to Japan will be taken up by mounting demands from Great Britain and assured improvement in domestic requirements.

New York — Scrap shipments against orders to steel mills are active but buying is not impressive. Scattered small lots of material are moving from this territory. The British have fixed a monthly quota for loading during the next two months at 75,000 tons monthly. At least one boat is due in New York to load for Japan, probably the last cargo before the embargo. Prices are firm but mostly unchanged.

Philadelphia — England continues the leading export outlet for scrap. The market is inactive in mill buying but prices generally are firm and unchanged. Relatively little scrap has been bought here recently for Japan and for that reason the trade is not affected by the embargo against that country. Mills are buying little but heavy consumption precludes long absence from the market.

Detroit—Little change is noted in scrap prices. Recent lists have brought close to the prices prevailing a month ago. Mills here still are of the opinion current prices are too high.

Cincinnati—Quotations on iron and steel scrap are unchanged although the market is less active. Most items are in good supply at present prices, except No. 1 heavy melting steel.

St. Louis — Purchases of round tonnages of heavy melting steel by two East Side mills at an advance of 50 cents per ton was the basis for another general rise in prices.

Seattle—Federal embargo on exports to the Orient, while not unexpected, has prompted shippers to fill commitments within the next fortnight. Consequently the market is firm and fancy prices are reported for spot lots. Prompt steamship space is not available and freights also are on the upgrade. Rolling mills are buying more freely.

San Francisco—In an endeavor to secure as much scrap as possible before Oct. 15, Japanese exporters are active and are paying considerably higher than price offered by domestic users. As a result, no price weakness has occurred and none is expected for some time to come as dealer stocks will be small when the embargo actually goes into effect.

Cold-Finished Alloy Bar Extras Increased

Pittsburgh—Leading producer of cold-finished alloy steel bars reaffirms present base prices, standard terms and conditions of sale for fourth quarter. All sales are subject

to extras and deductions dated Oct. 16, 1939, except for the following changes effective on all specifications received on and after Oct. 1.

Extras for alloy content, basic open-hearth steel, per 100 pounds: SAE 2300, increased from \$1.55 to \$1.70; SAE 2500 from \$2.25 to \$2.55; SAE 4600 from \$1.10 to \$1.20; SAE 4800 from \$2 to \$1.15. Electric furnace steel, per 100 pounds; SAE 2300 from \$2.05 to \$2.20; SAE 2500 from \$2.75 to \$3.05; SAE 4600 from \$1.45 to \$1.55; SAE 4800 from \$2.40 to \$2.55.

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ject to magnaflux test, is increased from \$1 to \$1.50 per 100 pounds. Sulphur content over 0.10 maximum has been dropped.

Warehouse

Warehouse Prices, Page 89

Cleveland—September warehouse sales were slightly better than in August as to daily rate and October starts with the same good volume. Prices on alloy steel were raised 10 to 25 cents per 100 pounds, effective Oct. 1. Because of good demand gen-

erally prices are reasonably firm.

Chicago—Warehouse sales are increasing, a result of normal good business and national defense. No changes in prices have taken place, although certain minor adjustments have been made in alloy steels on account of recent new mill extras.

Boston—Warehouse sales continue to mount, orders being more numerous and in some instances heavier, with demand well diversified. Small-lot alloy sales are active, dollar volume expanding. Machine tool builders continue to be active warehouse customers.

New York—Warehouses have followed mills in revising upward chemical extras on several alloy bar series, averaging 20 to 25 cents per 100 pounds. With demand well spread, including alloys, volume with jobbers is heavier. Extended mill deliveries benefit warehouse increasingly when prompt shipment is a factor.

Philadelphia—Sales are active in all products with volume sustained or heavier, compared with a month ago. Distributors encounter difficulty in getting sufficient supplies of some products, particularly alloy materials and seamless mechanical tubing.

Buffalo—Current sales are at the best levels in three years. Sellers are having difficulty replenishing supplies as mill deliveries are extended four to six weeks.

Cincinnati—Warehouse sales reached a new 1940 peak in September and the rate is being continued in early October business. Tonnage is being diverted from mills which are offering six-weeks delivery on some items. Prices are firm and unchanged.

St. Louis—Steel warehouse business is brisk, with September volume the best this year with several important interests. Some government business is appearing, but regular customer orders constitute most current trade.

Baltimore—Jobbers anticipate an improvement this month and possibly next, although admitting that much will depend upon weather which would affect miscellaneous building construction. September business, according to some jobbers, was about on a par with August.

Steel in Europe

Foreign Steel Prices, Page 89

London—(By Cable)—Deliveries of essential government war materials contracts are expanding in Great Britain, thanks to the increasingly favorable ore, scrap and semi-finished situation, enabling greater production. Ordinarily commercial business is more strictly limited.

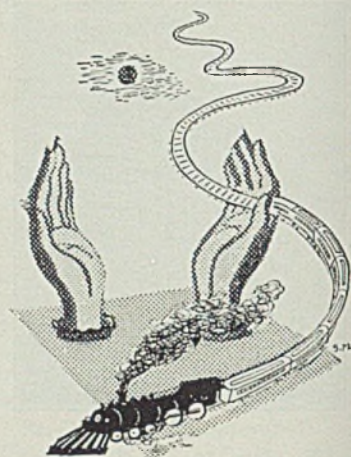
Tin plate continues dull in both domestic and export markets. Sheet and galvanized sheet production is practically restricted to domestic consumption.

Iron Ore

Iron Ore Prices, Page 90

Cleveland—Shipments of iron ore from upper lake ports in September totaled 9,998,618 gross tons, the highest record for September. The previous high mark was 9,621,756 tons in 1926. The September total was 2,133,611 tons or 27.13 per cent, greater than in September, 1939.

Cumulative tonnage to Oct. 1 was



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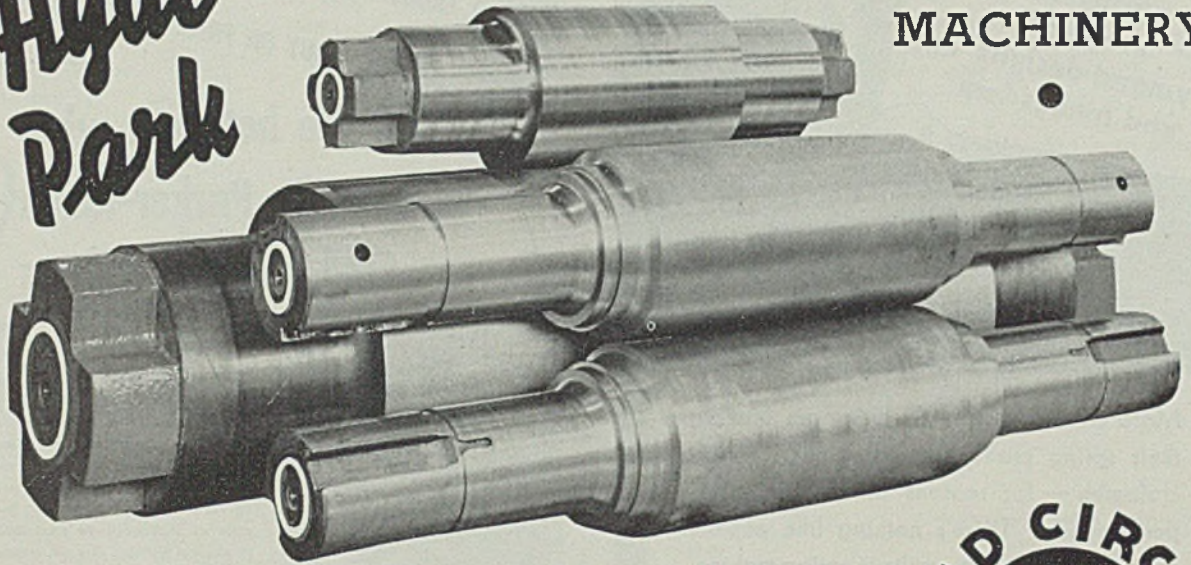
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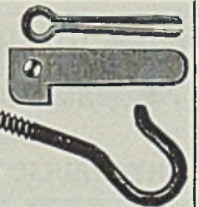


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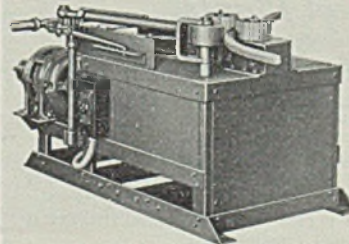
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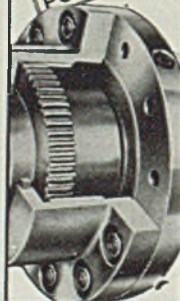
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New Brunswick, New Jersey

48,235,227 tons, a gain of 17,874,453 tons, 58.87 per cent over September, 1939.

Comparisons by ports for September are as follows:

	Gross Tons	
	Sept. 1940	Sept. 1939
Escanaba	599,667	364,191
Marquette	758,213	831,690
Ashland	911,218	1,031,570
Superior	3,339,743	2,776,476
Duluth	2,737,797	1,434,996
Two Harbors	1,588,008	1,426,084
Total U. S. Ports ..	9,934,646	7,865,007
Michigan	63,972	.....
Total	9,998,618	7,865,007
Increase from 1939 ..	2,133,611	.....

Comparisons by ports for the season to Oct. 1 are as follows:

	Gross Tons	
	To Oct. 1, 1940	To Oct. 1, 1939
Escanaba	2,550,367	1,700,590
Marquette	4,100,204	2,875,817
Ashland	4,452,194	3,652,317
Superior	16,919,361	9,729,885
Duluth	11,812,917	6,165,456
Two Harbors	8,159,050	6,236,709
Total U. S. Ports ..	47,994,093	30,360,774
Michigan	241,134	.....
Total	48,235,227	30,360,774
Increase from 1939 ..	17,874,453	.....

Nonferrous Metals

New York — Strong statistical positions of the metal industries coupled with moderate new demand which about balanced production tended to keep prices at firm levels last week. Only in tin was an easier tone discernible.

Copper—All sellers held electrolytic at the 12-cent level in the domestic market while it moved fractionally higher in the export market as American mills began to use larger tonnages for filling England's brass product orders. Custom smelters easily balanced their moderate intakes.

Lead — Although sales dropped to a moderate volume and well below the previous week's exceptional turnover, most sellers balanced their intakes and many exceeded them. Mexican lead advanced to 2.35c. f.a.s. Tampico, a level which is still not high enough to permit an upward revision in the domestic market. Prices held at 4.85c, East St. Louis, and 5.00c, New York.

Zinc—Buying pressure lifted further last week but some unsatisfied demand remained. Heavier output resulting from present expansion programs will not be available until the first quarter of next year and, therefore, the present tight supply situation is expected to continue for several weeks. Prime western held on the basis of 7.25c, East St. Louis.

Tin—Prices declined steadily from 51.50c at the beginning of the week to 51.00c at the close. The downward trend toward the minimum 50-cent level reflected at least in part the apparent easing in the Far Eastern tension. Imports have been equivalent to twice domestic consumption during the past two

months, thus making our supply situation the strongest in years.

Antimony—Only one carlot of antimony was reported sold last week in addition to usual caselot bookings. Prices held at 14.00c, New York, for American spot and nominally 16.50c, duty paid New York, for Chinese spot.

Nonferrous Metal Prices

Sept.	Copper			Straits Tin, New York	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99% Spot, N. Y.	Anti-mony Amer. Spot, N. Y.	Nickel Cathodes	
	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery								
28	12.00	12.00	11.62½	51.50	51.25	5.00	4.85	7.25	18.00	14.00	35.00
30	12.00	12.00	11.62½	51.50	51.25	5.00	4.85	7.25	18.00	14.00	35.00
Oct. 1	12.00	12.00	11.62½	51.50	51.25	5.00	4.85	7.25	18.00	14.00	35.00
2	12.00	12.00	11.62½	51.37½	51.00	5.00	4.85	7.25	18.00	14.00	35.00
3	12.00	12.00	11.62½	51.25	50.87½	5.00	4.85	7.25	18.00	14.00	35.00
4	12.00	12.00	11.62½	51.00	50.87½	5.00	4.85	7.25	18.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets	
Yellow brass (high)	19.23
Copper, hot rolled	20.62
Lead, cut to jobbers	7.25
Zinc, 100 lb. base	12.50
Tubes	
High yellow brass	21.98
Seamless copper	21.12
Rods	
High yellow brass	14.76
Copper, hot rolled	17.12
Anodes	
Copper, untrimmed	17.87
Wire	
Yellow brass (high)	19.48

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass	
New York	7.87½-8.12½
Cleveland	8.62½-9.12½
Chicago	7.75-8.25
St. Louis	8.37½
Heavy Copper and Wire	
New York, No. 1	9.50-9.75
Cleveland, No. 1	9.37½-9.87½
Chicago, No. 1	9.37½-9.62½
St. Louis	9.37½

Composition Brass Turnings

New York	7.50-7.75
Light Copper	
New York	7.50-7.75
Cleveland	7.37½-7.87½
Chicago	7.37½-7.62½
St. Louis	7.37½

Light Brass	
Cleveland	4.12½-4.37½
Chicago	5.25-5.50
St. Louis	4.87½

Lead	
New York	4.25-4.35
Cleveland	3.75-4.00
Chicago	3.85-4.10
St. Louis	3.50-3.75

Zinc	
New York	3.87½-4.12½
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum	
Mis., cast, Cleveland	8.50-8.75
Borings, Cleveland	5.50-6.00
Clips, soft, Cleveland	13.50-14.00
Misc. cast, St. Louis	7.75-8.00

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Brass ingot, 85-5-5-5, less carloads ..	12.25
Standard No. 12 aluminum ..	14.00-14.50

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Equipment

Chicago—Sales of machine tools and machinery in September were by far the best this year and in some instances best in several years. Only in recent weeks has national defense business been a direct factor, but it probably will be important from now on. Deliveries of production machines, such as drills, lathes, shapers, planers, boring mills, and the like, are as far off as the middle of 1941; on fabricating equipment, such as presses, brakes, shears, and similar items, two to three month's deliveries are the rule.

Construction and Enterprise

Connecticut

BRIDGEPORT, CONN.—Remington Arms Co. is erecting a group of buildings, largest to provide 26,000 square feet floor space.

BRIDGEPORT, CONN.—Ashcroft American Gauge division, Manning, Maxwell & Moore, is building a plant addition estimated to cost \$45,000.

BRIDGEPORT, CONN.—C. O. Jeliff Mfg. Co., manufacturer of wire cloth, is building a two-story brick and concrete manufacturing building, 28 x 40 feet, to cost about \$13,000.

BRIDGEPORT, CONN.—United Illuminating Co., 1119 Broad street, will build a power plant addition and steel tower at its Steel Point station, East Main street, costing \$40,000. Westcott & Mapes, Orange street, New Haven, Conn., are architects.

MILFORD, CONN.—American Windshield Specialty Co., 442 Boston Post road, has let general contract to J. Zandonella, 243 Thorne street, Bridgeport,

Seattle—Public works projects and contractors are buying in volume, all types of equipment, being in good demand. General Electric Co., low at \$23,835, will furnish a 1500-kva generator for Priest Rapids irrigation district, White Bluffs, Wash. Fairbanks, Morse & Co. have a contract to furnish pumps for the Pocatello, Idaho, water system. Standard Transformer Co., Warren, O., is apparently low to Bonneville project for furnishing 27 distributing transformers. Seattle will receive bids Oct. 8 for four sand spreaders and Oct. 9 for four snow plows. McNeil Island, Wash., prison has called bids Oct. 8 for automatic sprinkler system.

of Curtiss-Wright Corp., Vulcan and Kenmore avenues, will build underground hangars and workrooms on north and east borders of the municipal airport, at cost of \$500,000.

BUFFALO—National Aniline & Chemical Co., 1051 South Park avenue, will build a plant addition on Park avenue at cost of about \$40,000.

FALCONER, N. Y.—Excel Metal Cabinet Co. Inc., C. Johnson, manager, Jamestown, N. Y., will build a steel and concrete addition on East James street, to cost about \$55,000.

NEW YORK—Consolidated Edison Co., 4 Irving place, has plans by T. R. Galloway, care owner, for a five-story coal and ash tower at 43 East Thirty-ninth street, to cost about \$40,000.

NIAGARA FALLS, N. Y.—Union Carbide Co., 137 Forty-seventh street, will build a one-story 90 x 140-foot plant addition to cost about \$40,000.

SYRACUSE, N. Y.—Rollway Bearing Co., 541 Seymour street, H. Hodgins in charge, will build a plant addition costing \$40,000.

New Jersey

CALDWELL, N. J.—Curtiss-Wright Corp., propeller division, 64 Lakeview avenue, Clifton, N. J., has plans by Albert Kahn Inc., New Center building,

■ **Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 96 and Reinforcing Bars Pending on page 99 of this issue.**

Conn., for a one-story 65 x 155-foot plant. P. P. Petrofsky, 955 Main street, Bridgeport, Conn., is architect.

Rhode Island

CRANSTON, R. I.—Sewer commissioners, E. Higson, chairman, city hall, will build a sewage treatment plant. General contract has been given James A. Munroe & Sons, 159 North Washington street, Brattleboro, Mass. Cost estimated at \$658,000.

New York

AUBURN, N. Y.—American Locomotive Co., Auburn, and 30 Church street, New York, will build a plant addition costing \$45,000. General contract to Seneca Engineering Co., Montour Falls, N. Y.

BUFFALO—Bell Aircraft Corp., 2050 Elmwood avenue, will build an assembly and test hangar at the city airport at cost of about \$100,000.

BUFFALO—Curtiss Aeroplane division

Detroit, for a one-story brick and steel boiler house addition for its new propeller plant, to cost about \$40,000.

CAMDEN, N. J.—New York Shipbuilding Co., Broadway and Fairview street, will recondition two shipways at cost of about \$100,000.

JERSEY CITY, N. J.—Air Reduction Sales Co., 181 Pacific avenue, has let general contract to W. J. Barney & Co., 101 Park avenue, New York, for a one-story, 35 x 80 and 10 x 25-foot engine room and boiler house addition at its oxygen plant, to cost about \$50,000.

PATERSON, N. J.—Wright Aeronautical Corp., Guy W. Vaughan, president, Curtiss-Wright Aeronautical Corp., plans \$1,000,000 plant expansion for production of aircraft engines. Will include America's first magnesium foundry, adjacent to plant No. 3 at Fairfield, N. J., 200 x 500 feet.

PAULSBORO, N. J.—Socony-Vacuum Oil Co., 26 Broadway, New York, has let general contract to Brown Bros. Construction Co., 303 North Richmond avenue, Atlantic City, N. J., for a two-story 78 x 108-foot chemical engineering building.

Ohio

CLEVELAND—Lucas Machine Tool Co., 523 East Ninety-ninth street, takes bids Oct. 8 for a one-story extension 45 x 175 feet, and enlargement of crane bay, by H. M. Morse Co., engineer, 1500 Superior avenue. H. M. Lucas is president.

CLEVELAND—National Bronze & Aluminum Foundry Co., East Eighty-eighth street and Daisy avenue, John I. Schmeller, vice president, is reorganizing with outside interests putting in new capital and a plant addition is to be built immediately to care for increasing production.

CLEVELAND—Cleveland Pressed Steel Co., is being incorporated to take over business conducted under same name at 2953 East Fifty-fifth street, producing metal stampings. Building will be leased from interests in old company. Michael A.

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350-S

—Construction and Enterprise—

Feighan, Guardian building, will be one of new officers.

CLEVELAND—Electroline Mfg. Co., 2003 Superior avenue, is moving to 5604 Cedar avenue, where it has 14,000 square feet floor space. Punch presses are being purchased for production principally of adapter for sealed beam headlights, also for bumper foglights, brackets for recessed and fluorescent lighting.

ELYRIA, O.—Elyria Engineering & Tool Co. Ltd., 159 Ridge street, newly organized by Milton Hahn, 708 Park avenue, and associates, will start production of precision tools, gages, fixtures and special equipment about Oct. 10. Company is capitalized at \$25,000.

Pennsylvania

ERIE, PA.—American Sterilizer Co.,



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thousands
of World
Travelers**

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wherever well-
traveled people
meet and Philadel-
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immediately the
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ice, food, atmos-
phere, become
the absorbing
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reasonable.

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STRATFORD**

IN PHILADELPHIA

CLAUDE H. BENNETT, General Manager

G. W. Baeh, general manager, 1230 Plum street, will build a two-story 20 x 120-foot plant addition. General contract has been given to H. Platt Co., 922 Raspberry street. Meyers & Johnson, 821 Commerce building, are architects.

INDIANA, PA.—Rochester & Pittsburgh Coal Co., A. Householder in charge, will build a steel coal cleaning plant, including screens, conveyors and booms, at cost of about \$80,000. General contract has been given Fairmont Machinery Co., Fairmont, W. Va.

PHILADELPHIA—Reading Iron & Steel Co. is being incorporated to operate part of property of Reading Iron Co., recently purchased from Philadelphia & Reading Coal & Iron Co. Will produce iron, steel and galvanized products, particularly metal tubing.

WARREN, PA.—Pennsylvania Furnace & Iron Co., Pine street, will build a one-story steel and concrete addition, to cost \$40,000, with equipment.

WEST HOMESTEAD, PA.—Mesta Machine Co., L. Iverson, president, Eighth avenue, will build one-story forge plant additions, one of 60 x 300 feet and two of 60 x 90 feet, to cost \$1,000,000. H. Meinecke, Eighth avenue, is in charge.

Michigan

ALLEGAN, MICH.—Blood Bros. Machine Co. is erecting a further addition to its plant to accommodate larger production.

CLIO, MICH.—Clio Foundry Inc. has been incorporated with 400 shares no par value to operate a pattern and machine shop and foundry, by H. J. Calkins, 110 Bluff street, Clio, Mich.

DETROIT—Eveready Millwright Service Inc. has been incorporated with \$1000 capital to deal in industrial machinery, parts and equipment, by Tim Rogers, 5782 Crane avenue, Detroit.

DETROIT—Lyon Screw Products Inc., 679 Franklin street, has been incorporated with \$4800 capital stock to manufacture screw machine products, by Chester E. Lyon, 2567 Sturtevant avenue, Detroit.

GRAND HAVEN, MICH.—Puffer Hubbard Mfg. Co. has been incorporated with \$50,000 capital to manufacture wood and metal products, by A. H. Ringelberg, Grand Haven, Mich.

JACKSON, MICH.—Jackson Crankshaft division, Muskegon Motor Specialties Co., manufacturer of cam shafts and crank shafts, has given general contract to North-Moller Co. for one-story plant addition 105 x 106 feet. (Noted Sept. 16).

LOWELL, MICH.—Newell Mfg. Co. has been incorporated with \$50,000 capital to manufacture hardware and metal specialties, by Frank M. Newell and Otto Altenberger, Lowell.

MENOMINEE, MICH.—Signal Electric Mfg. Co., manufacturer of transformers, motors, drills, exhaust fans, plans construction of plant addition. Hubert & Gjelsteen are architects.

MENOMINEE, MICH.—Furton Bros. have been awarded contract for a sewage disposal plant for city of Fenton, Mich. Francis Engineering Co., Saginaw, Mich., is engineer.

MUSKEGON, MICH.—Wassell Mfg. Co. has been incorporated with \$50,000 capital to manufacture automotive parts by Alvin V. Martin, 435 Amity avenue, Muskegon, Mich.

RIVER ROUGE, MICH.—Ford Motor Co., 3674 Schaefer road, Dearborn, Mich., has plans by Giffels & Vallet Inc., 1000 Marquette building, Detroit, for a one-story airplane motor plant to cost about \$4,000,000 and equipment \$7,000,000 additional.

Illinois

DECATUR, ILL.—A. W. Cash Valve Mfg. Co., manufacturer of valves for plumbing and heating equipment, will build new \$65,000 factory with 16,000 square feet floor space, doubling present capacity.

Indiana

INDIANAPOLIS—Turner Aeronautical Corp., R. Turner, manager, municipal airport, has plans by O. A. Tislow, 819 Architects and Builders building, Indianapolis, for a one and two-story 145 x 178-foot steel and concrete hangar, to cost \$100,000.

INDIANAPOLIS—Diamond Chain & Mfg. Co., G. Wainright, president, 402 Kentucky avenue, is taking bids for a one-story 25 x 400-foot and five-story 25 x 60-foot addition through D. A. Bohlen & Son, architects, 1000 Majestic building, at cost of about \$225,000.

Georgia

ATLANTA, GA.—Seaboard Air Line railway, W. D. Faucette, chief engineer, will build a boilerhouse and shop building.

MACON, GA.—Georgia Power Co., Atlanta, Ga., has let contract for brick work for power plant superstructure to Smith & Pew Construction Co., 786 West Peachtree street N. W. Robert & Co., Atlanta are architects and engineers.

North Carolina

FAYETTEVILLE, N. C.—Owen Electric Co., N. L. Whitted, secretary-treasurer, will increase facilities for manufacture of electric welding machines.

Tennessee

MEMPHIS, TENN.—Dixie Steel Mfg. Co. Inc., subsidiary of Tulsa Boller & Machinery Co., 2020 Union street, Tulsa, Okla., has bought site on Railroad avenue and will build plant, first unit to be all-metal building for manufacture of oil and storage tanks and similar products.

NASHVILLE, TENN.—Vultee Aircraft Inc., Richard W. Mill, president, will have plans ready about Oct. 1 for Oct. 15 closing for factory and office building at Berry field, to cost about \$4,000,000. Marr & Holman, Stahlman building, are architects.

Virginia

STAR TANNERY, VA.—American Alloys Co., Philadelphia, plans construction of manganese refining plant in Frederick county, near this city. Will operate through a subsidiary organized to supply the government 100,000 tons of 48 per cent manganese ore annually.

Missouri

KANSAS CITY, MO.—W. S. Dickey Clay Mfg. Co., New York Life building, will install circular kiln and series of 15 drying tunnels in its new plant at Kansas City. Plant will consist of several buildings on site of old plant in north-east industrial district. Alfred Benbers, 10 West Ninth street, is architect.

ST. LOUIS—Terminal Railroad Association, P. J. Watson Jr., president, plans a one-story engine house and shop facilities at Fourteenth and Poplar streets, with 25,000 square feet floor space, to cost \$65,000 with equipment.

ST. LOUIS—National Slug Rejector Co. Inc., 5055 Natural Bridge road, John Gottfried, president, recently incorporated, is building a factory and office building at 5100 San Francisco avenue for manufacture of coin machine mechanisms, at cost of about \$90,000. (Noted August 12.)

ST. LOUIS—Pittsburgh-Erie Saw Corp.

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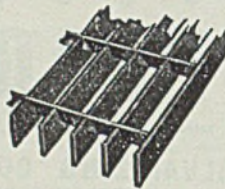
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—Construction and Enterprise—

Bernard L. Greer, branch manager, 1569 Tower Grove avenue, is building a one-story plant addition, with 3000 square feet of floor space, to cost \$45,000 with equipment. Company manufactures saws and other cutting equipment. (Noted July 2.)

Arkansas

FORT SMITH ARK.—Arkansas-Oklahoma Smokeless Coals Inc., Fort Smith, George Reeves, president, will build coal-preparation plant near Hackett, Ark., to process coal from four mines at Excelsior, Ark., for shipment to St. Louis.

Wisconsin

BEAVER DAM, WIS.—Malleable Iron Range Co. will build a two-story plant addition 98 x 252 feet. R. R. Boyd, 112½ South Spring street, is architect.

CORNELL, WIS.—Cornell Wood Products Co. has given general contract to Hoepfner-Bartlett Co., Eau Claire, Wis., for a one-story plant addition 60 x 100 feet.

JANESVILLE, WIS.—Chicago, Milwaukee, St. Paul & Pacific railroad has given general contract to J. P. Cullen & Son for construction of a roundhouse addition and improvements to cost about \$50,000.

LA CROSSE, WIS.—La Crosse Boiler Co. and subsidiary, LaCrosse Trailer & Equipment Co., manufacturers of heavy duty trailers, plan construction of two one-story factory additions, 48 x 52 and 53 x 142 feet.

MILWAUKEE—Kemp Smith Machine Co., 1819 North Seventy-first street, manufacturer of machine tools, is building an addition 53 x 186 feet, to cost about \$26,000.

MILWAUKEE—Lavine Gear Co., 634 East Keefe avenue, has given general contract to Meredith Bros. Co., for construction of factory 100 x 100 feet. R. E. Oberst, 2559 North Twenty-seventh street, is architect.

WEST MILWAUKEE, WIS.—Chain Belt Co., 1600 West Bruce street, will build a two-story 72 x 122-foot and 30 x 90-foot plant addition. General contract has been given to W. W. Oeffem Inc., 5345 North Hopkins street, Milwaukee, Eischwelter & Eischwelter, 720 East Mason street, Milwaukee, are architects.

Minnesota

CLEMENTS, MINN.—Central Minnesota power co-operative, Edward Turner, manager, plans 214 miles rural transmission lines to serve 430 customers, on which bids will be taken soon.

FRANKLIN, MINN.—Village will vote soon on \$19,000 bond issue to finance construction of sewage system and disposal plant. William J. Fleischer is village clerk.

MINNEAPOLIS—Modern Pattern Co., 3023 Snelling avenue, is building a new foundry building, to contain heat-treating furnace, melting furnace and similar equipment. Company is licensed by Dow Chemical Co., Midland, Mich., to produce magnesium castings for airplane use.

MONTICELLO, MINN.—Village council, L. L. Hawkins, recorder, will open bids Oct. 8 for waterworks improvements, including steel tank and steel tower. Druar & Millnowski, Pioneer building, St. Paul, are engineers.

ST. PAUL—United States engineer office, 615 Commerce building, will take bids Oct. 10 for a steel barge and appurtenances for the United States engineer boatyard at Fountain City, Wis.

Texas

DALLAS, TEX.—T. R. Jones, Magnolia

building, Dallas, Tex., has contract for pipe line for Magnolia Pipe Line Co., 42 miles of 8-inch. Storage and gathering system will be built at end of line.

HOUSTON, TEX.—Deere & Co., Moline, Ill., are having plans prepared for plant building, for bids Nov. 1, by its own architectural staff.

South Dakota

MILBANK, S. DAK.—City, A. A. Blomquist, auditor, takes bids Oct. 8 on a 200-pound coal stoker for city auditorium with three-phase motor and relay, low-water cutoff, installed.

Iowa

KNOXVILLE, IOWA—City council, Frank Crawford, city clerk, will open bids Oct. 21 for waterworks improvements, including pumping equipment and 32,500 feet of twelve-inch watermain. Foth & Boyd, Green Bay, Wis., are engineers.

LE MARS, IOWA—Plymouth electric co-operative association, A. M. Forsberg, superintendent, has been allotted \$158,000 REA funds for 210 miles of rural transmission lines. K. R. Brown, Valley Bank building, Des Moines, Iowa, is engineer.

Montana

KALISPEL, MONT.—WPA has approved project for sewage disposal plant to cost \$53,000, including pump house, tool shed and pipe and fittings. F. J. Robischon is city clerk. (Noted August 12.)

Pacific Coast

GRAND COULEE, WASH.—A. A. Eimore, heading a group promoting proposed smelter to reduce low-grade ores, announces construction will start about Jan. 1. Additional financing is being done.

SEATTLE—Seattle Steel Co. is building a steel storage warehouse at 1200 Fourth avenue South. Richard Ellis is engineer. General contract to Austin Co.

SEATTLE—Lake Washington Ship-

yards is building a steel fabricating shop 130 x 250 feet and extending pattern shop 80 feet to meet need for larger production.

SPOKANE, WASH.—City has retained Burns & McDonnell, Kansas City, Mo., to survey feasibility of proposed municipal power system to connect with Coulee and Bonneville generating stations. Report will be voted on at March election.

Canada

LEASIDE, ONT.—Small Electric Motors of Canada Ltd., 57 Yonge street, Toronto, Ont., will build \$30,000 plant addition on Brentwood street. R. J. Hibbs Construction Co. Ltd., 15 Trent avenue, Toronto, has general contract.

LONDON, ONT.—Richards-Wilcox Canadian Co. Ltd., Chelsea Green, hardware and metal products, will build plant addition 50 x 125 feet. General contract has been given to Putherbough Construction Co., 320 Colborne street. Watt & Blackwell, 284 Dundas street, are architects.

OSHAWA, ONT.—Pedlar People Ltd., metal products, will build plant addition on SImsoe street, costing about \$40,000. Bathe & McLennan, 81 King street, has general contract.


TORONTO, ONT.—Canadian Acme Screw & Gear Ltd., 207 Weston road, is building two-story addition 60 x 360 feet. Disher Construction Co. Ltd., 80 Commissioner street, has structural steel contract. J. Robert Page, 18 Toronto street, has general contract.

LONGUEIL, QUE.—Bids will be called at once for waterworks plant to cost \$30,000 and also for equipment. Adrien Plamondon, 360 Mount Royal avenue, Montreal, Que., is consulting engineer.


MONTREAL, QUE.—Canadian Car & Foundry Co. Ltd., 621 Craig street West, will build a \$50,000 addition, general contract to H. C. Johnston Co. Ltd., 1592 St. Catharine street West, and a new plant costing \$50,000 on Notre Dame street East, general contract to Foundation Co. of Canada Ltd., 1538 Sherbrooke street West. Spencer, Mathias & Burge, 2063 Union avenue, are architects.

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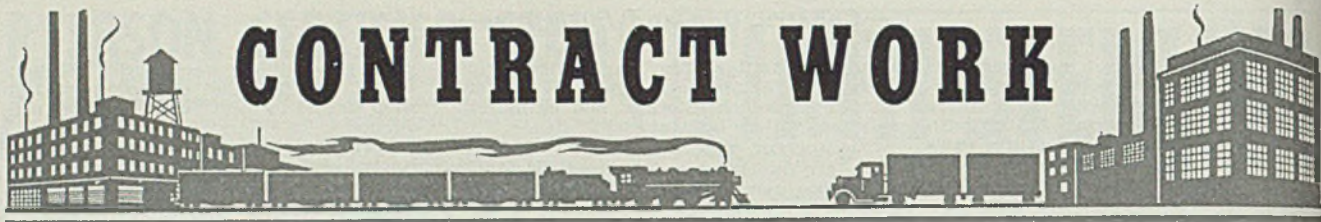
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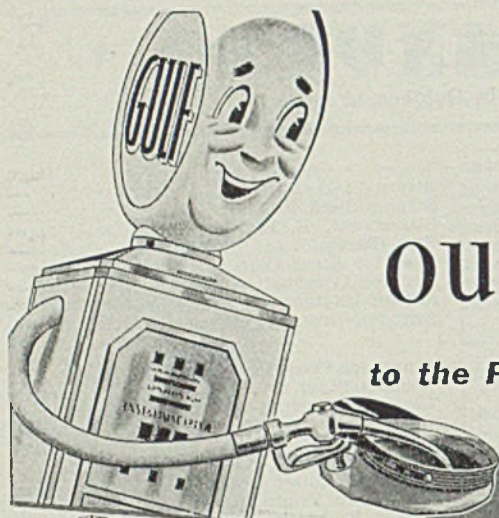
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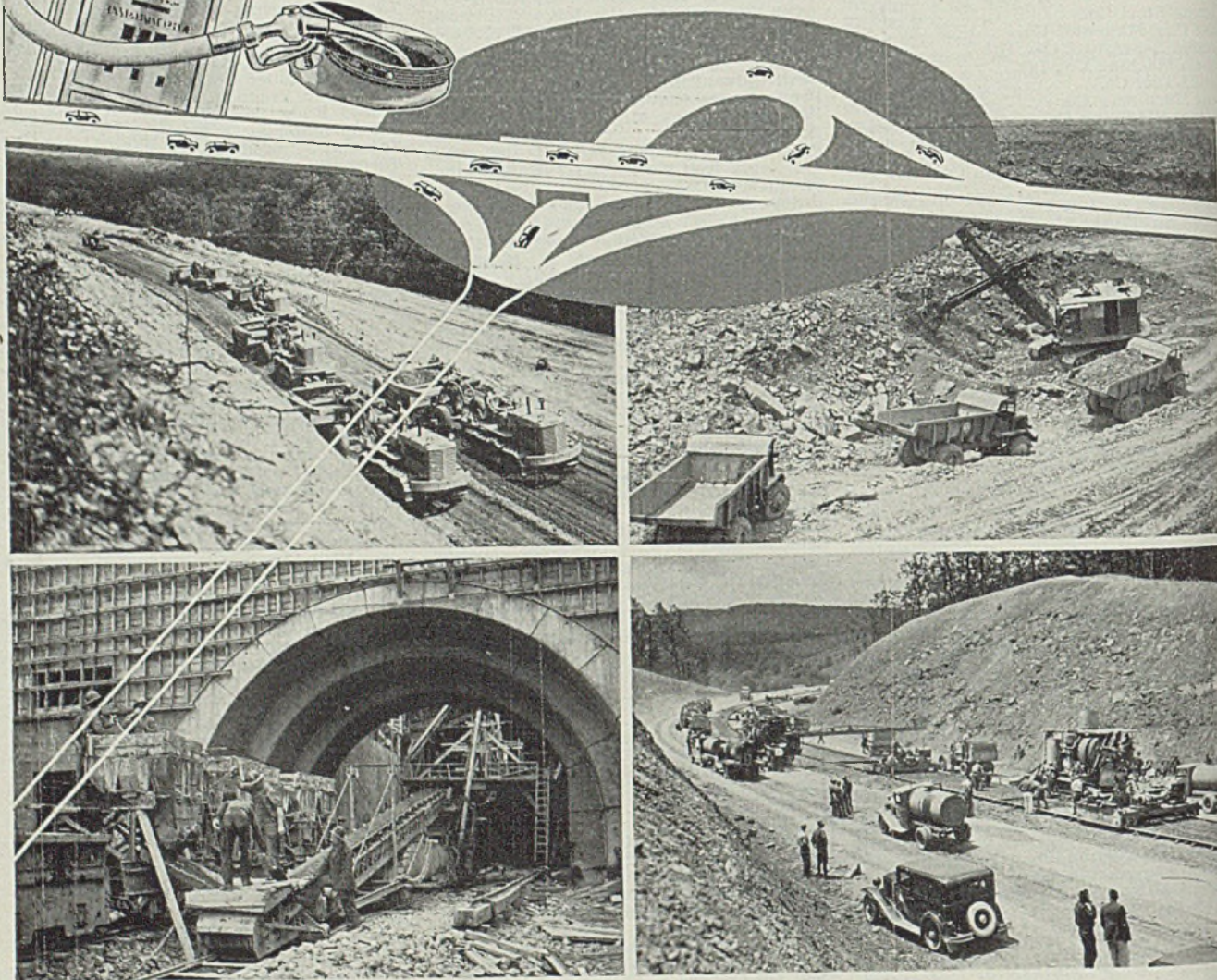
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