STEEL

ESTABLISHED 1882

Contents

Volume 107—No. 2 **July 8, 1940**

PRODUCTION · PROCESSING · DISTRIBUTION · USE

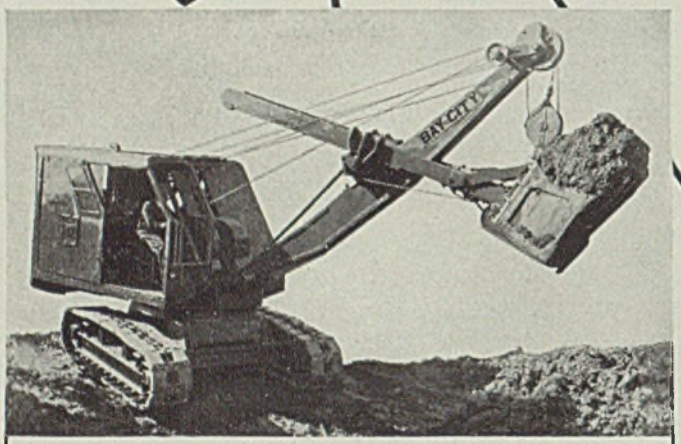
MORE STRENGTH TO MEET STRESS...

50 *places in a power shovel...*

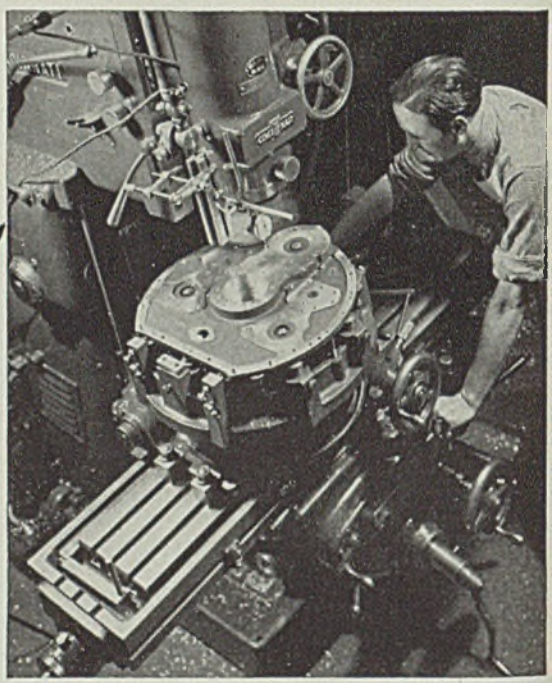
85 *places in a rock drill...*

275 *places in a milling machine*

NICKEL ALLOY STEELS



Measured by weight, nearly ⅓ of this Bay City power shovel is fabricated from long-wearing Nickel alloy steels. 50 vital parts which must withstand fatigue strains, shock stress and overloads are made of SAE 3135 oil quenched Nickel-chromium steel and other Nickel alloy steels. Frames and bases are Nickel cast steel. "Chabelco" crawler drive chains, Diamond crowd chain, Hercules gasoline and Caterpillar Diesel engines on Bay City shovels also employ high strength Nickel alloy steels for important stressed components.



More than 275 stressed parts in this dial type Cincinnati milling machine are Nickel alloy steels. Nearly 200 of these parts are made of a Nickel-chromium steel, heat treated to high strength yet readily machinable. Parts subject to wear are case-hardened.

Here are five Gardner-Denver rock drills mounted for tunnel driving. In each drill, 85 stressed parts are produced from Nickel alloy steels. The Gardner-Denver Co. writes, "Through increased use of Nickel alloy steels, remarkable improvements in performance and reduction in maintenance costs have been accomplished—without comparable increase in weight or bulk."

. . .

Purchasing and production are often simplified because the versatility of Nickel steels usually permits one Nickel steel to efficiently serve many purposes. Practical answers to your inquiries will be given promptly, based upon our broad experience with many industries. Please address:

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

HIGHLIGHTING THIS ISSUE

■ EXCEPTING for the speed with which the President is requesting—and receiving—many additional billions for the national defense program, actual execution of that program, in the eyes of the average manufacturer, is developing rather slowly. Last week's only dramatic award—and it was the biggest of its kind in history—involved 44 warships and one noncombatant vessel (p. 24) bringing to 93 the number of vessels the navy has placed on order as a result of recent appropriations. Most manufacturers continue to await word as to what they will be called upon to furnish, and when. . . . In the meantime, a "steeply graduated excess profits tax" (p. 30) is to be added to the present burden.

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Five More Billions

The President is expected this week (p. 32) to ask for five more billions, four for the army and one for the navy. How soon these amounts will be expended on orders in actual production no one knows. The word to go ahead appears overly delayed in many instances. For example, Packard Motor Car Co. (p. 23) is prepared to spend $30,000,000 on plant expansion and equipment for Rolls Royce engine production. It is held up by nonconsummation of contracts. If there are valid reasons for such delays they are not apparent to industry. . . . In the meantime, government buying (p. 23) is gathering some momentum. Many manufacturers, too, are getting ready for future business (p. 22) by launching important expansion programs.

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To Buy Tin, Rubber

No immediate change is anticipated (p. 23) in existing government purchasing methods. . . . Through two new subsidiaries (p. 24) the Reconstruction Finance Corp. will buy 75,000 tons of tin, 150,000 tons of rubber. . . . A licensing system (p. 22) was applied July 5 to many exports; the state department (p. 32) has a new division of commercial treaties and agreements. . . . Observance of Independence Day caused steel production last week to drop off 14 points (p. 27) to 75 per cent of ingot capacity. The industry already has snapped back to a higher level in an effort (p. 81) to catch up with mounting backlogs. Deliveries of some products, notably bars, are several weeks behind.

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Ships All Welded

A. J. Grassick (p. 44) describes methods and facilities at the new Ingalls shipyard at Pascagoula, Miss., where ship sections are assembled exclusively by arc welding. The plant investment is about one-third that of the conventional shipbuilding plant. . . . Ingenious fixtures (p. 48) frequently make it possible to apply mass production methods to short-run machining operations. . . . James Allison (p. 49) discusses control technique necessary for production of perfect forged parts for aircraft. . . . Harold Lawrence (p. 56) points out that efficient current distribution is necessary for improved weld quality, greater production, less waste of rod and operator's time.

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Tool Salvage

E. J. Stone suggests methods by which (p. 66) machine tools taken out of the production line as a result of changes in product design often may be diverted to other work with production and cost advantages. . . . Walter J. Brooking (p. 56) describes a simple, economical materials handling system which takes care of all requirements at a fabricating plant spread over large ground area and producing large and bulky as well as large numbers of small parts. . . . W. F. Aylard and E. J. Dunn (p. 70) describe an electric salt bath installation which is proving efficient in heat treating precipitation-hardening, copper-base alloys. . . . E. S. Dawson and M. H. Mawhinney (p. 62) tell the story of blast furnace ruins at Lisbon, O.

E C Kreutzberg

"It's because we are turning out more parts, at lower cost," says this operating manager, "but that is only part of the story. Inland Quality Sheets and Inland Co-operation help us give our customers finer products and better service."

Inland quality is based on using only the best of controlled raw materials. Inland Steel is processed on the most modern continuous mills, by men who are masters of steel making. Backing this strong combination is an expert staff of metallurgists that co-operates with customers, works with the mill men, and carries on endless research

Inland customer co-operation goes far beyond the routine. It includes catching on to the spirit of things, being able in many intangible ways to help each user do his job better, easier and more economically. It includes thoughtful anticipation of demands, and constructive help on all problems from early design stage through production of finished parts. All these play a role in the established preference for Inland Sheets. You, too, can gain by using Inland Sheets and Inland Service

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INLAND STEEL CO.

HOT and COLD ROLLED SHEETS

Industry's First Half Active, but Below 1937

"Armament Economy" Fails To Surpass Recovery Year.

Third Quarter Outlook Is for Accelerated Production.

Defense Program Contracts in Larger Volume.

Government Moves To Acquire Strategic Materials.

Britain Places 112,000 Tons of Rails.

■ THE EUROPEAN war, with all its repercussions in America, affected iron and steel production in the United States only moderately during the first half of 1940.

Tonnage did not equal that of the first six months in 1937, though it did exceed output in the comparable periods in all other years since 1929.

First half of 1937 was marked by forward buying for inventory. Fear of strikes in steel mills, higher wages and prices coupled with the accumulated deficit of goods from depression years contributed to a production rate that outran consumption and ended in the autumn recession.

In contrast, caution was the watchword at the beginning of 1940. Manufacturers were loathe to expand plants for fear sudden peace would leave them with excess capacity. With few exceptions this continued until the launching of the national defense program.

Exports of finished steel in the first five months this year amounted to 12.5 per cent of the total (see page 26) compared with 5.4 per cent in the first six months of 1939, and 4.5 per cent in the first half of 1937.

With the exception of aircraft and machine tools, first half business included few large direct war orders. This country's defense program, launched in May, had a stimulating effect, but resulted in comparatively meager orders to June 30.

Steel ingot production in the six months just ended is estimated at nearly 29,000,000 net tons, compared with 20,958,723 tons in first half of 1939; 12,083,212 tons in 1938; 32,210,035 tons in 1937, and 23,829,229 tons in 1936.

Pig iron output in the first half, 21,042,643 net tons, approached the 1937 figure of 22,143,895 tons and easily exceeded any other recent year. Production in 1939 was 14,023,667 tons; in 1938 only 8,882,830 tons; and in 1936, 15,208,879 tons.

Automobile assemblies for the past six months, 2,543,674, were exceeded by similar periods in 1937 and 1936 when 2,916,869 and 2,594,508 units, respectively, were made. This year's production to date is nearly double 1938 production, 1,305,501; and 25 per cent above last year's 2,055,744.

Iron ore shipments for the season to July 1 were 17,196,038 tons, compared with 9,231,249 last year; 4,278,962 in 1938; 23,922,294 in 1937; and 11,677,510 in 1936. Most shippers have revised their preseason estimates of 45,000,000 tons upward to as high as 62,000,000 tons.

Carloadings have followed the general trend although numerically the fluctuations have been less pronounced. An estimated 17,007,000 in the past six months compares with 14,677,000 in the first half of 1939; 13,641,000 in 1938; 18,237,000 in 1937 and 16,583,000 in 1936. Forecasts for the present quarter are that loadings will be 9 per cent above the third quarter last year.

Iron and steel scrap consumption in the first half kept pace with steel production and is estimated at 19,889,000 tons, compared with 14,450,000 tons in first half last year and 8,302,000 tons in 1938.

Gear sales are in line with the general pattern, the American Gear Manufacturers' association's index averaging 123 for the first five months this year, against 92 in the first half last year; 77 in the first six months of 1938; 148.5 in 1937; and 98.5 in 1936.

Construction contracts have been about on a par with 1939, the best year since 1930. Announcement of the national defense program, however, has brought out a heavy volume of expansions and new construction plans which promise to make the last half a period of unusual activity in this field.

That industrial activity will be accelerated—for at least the third quarter—appears assured.

Great Britain is inquiring for and

2,000,000 Tons of Iron, Steel Bought by Allies

NEW YORK

■ Two million tons of iron and steel have been purchased by Great Britain and France in this country since the war started, British purchasing commission spokesmen said last week. French purchases alone totaled 800,000 tons, most of which was taken over by the British after the French collapse.

The British commission has spent approximately $1,800,000,000 in this country; $100,000,000 was expended last week. Of the grand total, 60 per cent was for airplanes, with ordnance the second largest item.

It was estimated Britain placed 112,000 tons of rails in the United States within the past fortnight.

has placed large tonnages of finished steel and other products. If the war continues in Europe, it is likely England will continue to take large tonnages.

Offsetting the inflationary influences of our armament economy are several factors—real and possible.

The tremendously higher taxes necessitated by armament building—and already felt by the man-in-the-street—will, of course, be a deterrent.

Collapse of Great Britain or any probable termination of the war in Europe, and the cancellation of orders for war materials, would be a setback. Even if the United States government took over the orders, time would be required to revise specifications.

Normal export trade already has been disrupted and its future is uncertain.

Another possibility—however faint—is that a turn of events in Europe would lessen the fears that created this country's defense program. Were these fears allayed by a realignment of European powers, or any other cause, the armament program might be sharply curtailed.

Munitions, Materials, Machines Placed Under Export Control

■ PRESIDENT ROOSEVELT last week placed a virtual embargo on the sale to foreign nations of any munitions, materials or machinery needed in the national defense program. By proclamation he subjected all such shipments to rigid control under military direction and supervision.

Lieut. Col. Russell L. Maxwell of the army was appointed administrator of export control.

Materials and production divisions of the national defense advisory commission are collaborating with Lieut. Col. Maxwell in determining the items to be controlled and the extent and character of the controls.

While the control of exports is primarily a national defense matter, the department of state provides the machinery for issuing licenses under which any items are released for export.

Licensing system became effective July 5.

Among articles and materials for which licenses must be obtained before export are arms, ammunition and implements of war; such basic materials as aluminum, antimony, chromium, manganese, tin, tungsten, vanadium; a number of chemicals and aircraft parts, equipment, and accessories other than those listed in proclamation of May 1, 1937, and armor plate, other than listed in proclamation of May 1, 1937. Also covered is metalworking machinery for melting or casting, pressing into forms, cutting or grinding and welding.

In authorizing the secretary of state to issue the export licenses the President proclaimed:

"I do hereby empower the secretary of state to issue licenses authorizing the exportation of any of the said articles and materials the exportation of which is not already subjected to the requirement that a license be obtained from the secretary of state authorizing their exportation and I do hereby authorize and enjoin him to issue or refuse to issue licenses authorizing the exportation of any of the articles or materials listed above in accordance with the aforesaid rules and regulations or such specific directives as may be, from time to time, communicated to him by the administrator of export control."

Industry Builds, Expands and Tools for Defense Program

■ PACKARD Motor Car Co., Detroit, will spend approximately $30,000,000 to expand and equip its plant for the production of Rolls-Royce engines if pending contracts with the United States and British governments are closed.

Contracts under negotiations call for 3000 engines for this country and 6000 for Great Britain, for a total of about $150,000,000. This provides for tooling costs as well as the delivered cost of the engines.

Most of the expenditures will be for tools and equipment. Only new buildings required will be test sheds.

If the contract is signed, Packar can be in production within te months at an initial rate of 20 e gines monthly. This could be i creased to 840 monthly by the en of the following five months.

In the aircraft industry it is u derstood the national defense co mission contemplates a $500,000,0 expansion to achieve the President demand for 50,000 planes a year, a upward revision from an earlier wa department estimate that $300,00 000 would be required for aircra plants and $60,000,000 for engi plants.

Vega Airplane Co., Burban Calif., a subsidiary of Lockheed Ai craft Corp., Los Angeles, has starte construction of a $3,500,000 plant Burbank. The new plant will r quire between 8000 and 10,000 em ployes.

Cleveland Punch & Shear Work Co., Cleveland, has installed equi ment in its 34,000-square foot a dition and increased production c pacity by 50 per cent.

Continental Can Co. Inc., Ne York, has awarded a contract fo the erection of a steel, brick an concrete canning factory and war house at Walla Walla, Wash., t the Austin Co., Cleveland. Tota floor space will be 125,000 squar feet.

Aluminum Co. of America is com pleting a $350,000 plant moderniza tion and new equipment progra at Buffalo. Between 300 and 40 men will be trained to produce cas ings for aircraft.

Rebuilds Coke Ovens

Bethlehem Steel Co., Bethlehe Pa., has awarded a contract to Ko pers Co., Pittsburgh, for rebuilding battery of old-type Koppers cok ovens into a battery of 51 moder Koppers-Becker ovens at company' Northampton plant. Ovens are to b completed early in 1940, will cos between $300,000 and $400,000.

Shell Oil Co. Inc. will spend $3 250,000 for expansions in the S Louis area and Illinois. Expenditur is in addition to the $10,000,000 Woo River, Ill., refinery just completed.

City Machine & Tool Co., tool an die division, City Auto Stamping Co Toledo, O., has started constructio of a one-story $500,000 plant addin 80,000 square feet of floor space t the Toledo Factories building, space increase of 20 per cent.

Johnson Bronze Co., New Castle Pa., will erect a new building 100 1000 feet.

U. S. Electrical Motors, Los An geles, Calif., has purchased a 40-acr plot of land in Milford, Conn., o which it will erect a plant employ ing 200.

Hannifin Mfg. Co., St. Marys, O. will build a 35 x 220-foot plant addi tion.

Bayonne Steel Barrel Co., subsi

diary of Jones Laughlin Steel Corp., Bayonne, N. J., will erect a plant in Port Arthur, Texas, to make steel barrels and similar products.

St. Marys Mfg. Co., subsidiary of Goodyear Rubber Co., St. Marys, O., is erecting a unit, to be completed Sept. 1, which will double size of plant.

E. I. du Pont de Nemours & Co., Wilmington, Del., have an option on 500 acres of land near Morgantown, W. Va., on which they are considering erecting a plant similar to its plant at Belle, W. Va.

Armour & Co., Kansas City, Kans., are erecting a $245,000 building, the first of a $1,000,000 modernization program.

E. R. Squibb & Sons Co., New York, will erect a 12-story building 85 x 142 feet, and a wing, six stories, 63 x 84 feet. Construction will be reinforced concrete.

Lambert Auto-Ordnance Corp., St. Louis, has been incorporated to manufacture automatic rifles, machine guns, cannon and projectiles. Stadford L. Lambert is president.

Pittsburgh Plate Glass Co., Pittsburgh, will build a 750,000-square foot mirror assembly plant at No. 4 works, Ford City, Pa.

Micromatic Hone Corp., manufacturer of honing machine tools, will occupy larger quarters in a new location at 1345 East Milwaukee avenue, Detroit, effective July 8. This expansion represents an increase of approximately 75 per cent in number of employes and more than 100 per cent in space.

Electric Boat Co., Groton, Conn., will erect new buildings and building slips to double present production capacity.

A 3-story building, 160 x 164 feet, with more than 75,000 square feet, will be added to the plant of the Berger Manufacturing division of Republic Steel Corp., Canton, O. It will be used jointly for manufacturing and offices. The present office building will be demolished.

Existing Purchasing Agencies To Continue, Says Co-Ordinator

■ DON. M. NELSON, co-ordinator of national defense purchases, last week said he contemplates continuance of present government purchasing offices. Barring changes unforeseen at this time, these agencies will handle the actual buying for defense needs. Principal agencies are the bureau of accounts and supplies of the navy, quarter master general of the army and the treasury's procurement division which handles general government purchases.

Mr. Nelson, formerly executive vice president of Sears-Roebuck & Co., will not make any purchases himself—unless the present plans are changed, but will only co-ordinate purchases by the army, navy and other departments. For example, if the question arises as to whether the army needs steel for a certain purpose before the navy does, it will be up to Mr. Nelson to determine who shall have priority.

While details have not yet been worked out, Mr. Nelson says he hopes to simplify and possibly standardize many government specifications and contracts.

That he may devote all his time to co-ordinating defense purchases, Mr. Nelson has resigned as acting head of the treasury's procurement division. He has been succeeded in the procurement division by Clifton E. Mack, a civil service career man.

Navy Awards Contracts for Machinery, Equipment, Supplies

■ BUREAU of supplies and accounts, United States navy department, has awarded the following contracts:

Enterprise Engine Co. division, Enterprise Foundry Co., San Francisco, marine diesel engines, $21,786.

Western Pipe & Steel Co. of Calif., San Francisco, mooring buoys, $109,742.50.

Graybar Electric Co. Inc., Washington, wire rope and mooring fittings, $77,411.25.

Maine Steel Inc., Portland, Me., wire rope and mooring fittings, $38,844.40.

McKay Co., Pittsburgh, chains and fittings, $123,728.15.

S. G. Taylor Chain Co., Hammond, Ind., chains and fittings, $6985.04.

Seattle Chain & Mfg. Co., Seattle, Wash., chains and fittings, $19,820.22.

Johnson-Farmer Chain Co., Lebanon, Pa., chains and fittings, $7220.

Phelps Dodge Copper Products Corp., New York, condenser tubes, $11,242.69.

Edwards Mfg. Co., Cincinnati, practice bombs, $53,100.

National Tube Co., Washington, steel tubing, $6011.10; boiler tubes $17,332.91.

Joseph T. Ryerson & Son Inc., Chicago, steel tubing, $5244.82.

Yellow Truck & Coach Mfg. Co. division, General Motors Corp., Pontiac, Mich., trucks, $5746.04.

Consolidated Aircraft Corp., San Diego, Calif., heating system, $17,089.80.

Henney Motor Co., Freeport, Ill., ambulances, $15,750.

Summerill Tubing Co., Bridgeport, Pa., tubing, $16,023.37.

Titusville Forge Co. division, Struthers Wells-Titusville Corp., Titusville, Pa., crankshafts, $16,950.

General Electric Co., Schenectady, N. Y., turbo-generator sets, $110,189.

Toledo General Mfg. Co., Toledo, O., bench type drills, $6329.84.

Bay City Shovels Inc., Bay City, Mich., crane, $9400.

Bausch & Lomb Optical Co., Rochester, N. Y., ship telescopes, $36,340.

National Forge & Ordnance Co., Washington, propeller shafts, $17,275.

Spencer Lens Co., Buffalo, projectors, $9394.

Engineering & Research Corp., Riverdale, Md., blades for test clubs, $81,100.

Brewster Aeronautical Corp., Long Island City, N. Y., model airplanes surfaces, $17,310.

Wright Aeronautical Corp., Paterson, N. J., engine, $58,567.

Fairbanks, Morse & Co., Chicago, parts for diesel engines, $19,617.70.

Aviation Mfg. Corp., Lycoming division, Williamsport, Pa., airplane wheels, $11,492.

Wright Aeronautical Corp., Paterson, N. J., engine, $36,304.80.

United Aircraft Corp., Pratt & Whitney division, E. Hartford, Conn., engine, $80,380.72.

Bureau of yards and docks, United States navy department, has awarded the following contracts:

Buildings at naval air station, Alameda, Calif., to Moore & Roberts, San Francisco, $427,324.

Laundry equipment at naval air station, Jacksonville, Fla., to American Laundry Machinery Co., Cincinnati, $49,819.

Roads, walks, paving, and service connections at naval aviation patrol base, Floyd Bennett field, Long Island, N. Y., to Gould & Kress Inc., New York, $93,640.

Borings and test piles at Hunters Point drydocks, San Francisco, to Duncanson & Harrelson Co., San Francisco, $8649.

Installation of exhausters and exhauster piping at naval aircraft factory, navy yard, Philadelphia, to Arnold M. Diamond, Brooklyn, N. Y., $42,306.

Completion of fuel system at naval aircraft factory, navy yard, Philadelphia, to Warren J. Cathcart, Philadelphia, $50,678.

Improvements to shipways at navy yard, Philadelphia, to Duffy Construction Corp., New York, $215,000.

Bachelor officers' quarters and administration building at naval air station, Jacksonville, Fla., to T. A. Loving & Co., Goldsboro, N. C., $767,500.

Superstructure of assembly and repair shop at naval air station, Jacksonville, Fla., to Doyle & Russell, Richmond, Va., $772,160.

Exhausters at naval aircraft factory, navy yard, Philadelphia, to Ingersoll-Rand Co., Philadelphia, $132,750.

Building and control tower at naval air station, Alameda, Calif., to Martinelli Construction Co., San Francisco, $158,000.

Repairing and painting radio towers and renewing obstacle lights and wiring at naval station, Key West, Fla., to W. M. Whitmire Inc., Jacksonville, $10,677.

Boilers and power plant equipment at naval hospital, Newport, R. I., to Bass Engineering and Construction Co., Detroit, $38,400.

Installation of refrigerating equipment at naval training station, Newport, R. I., to E. Pulver Cook Inc., Providence, R. I., $2689.

Roads and exterior services for officers' quarters area at naval air station, Alameda, Calif., to McGuire & Hester, Oakland, Calif., $84,447.

Warship Awards Largest in History of United States

■ CONTRACTS for 44 warships and one noncombatant vessel to cost $550,000,000 to complete were awarded last week within two hours after the President had signed the "speedup" bill authorizing negotiated contracts without competitive bidding and an advance of 30 per cent of the contract price to finance plant expansion in private yards. It was the largest single contract letting in United States history. They will add 193,000 tons to the fleet.

Several days later the navy awarded three aircraft carriers and two cruisers to cost $169,530,000. These with ten destroyers and nine submarines, estimated to cost $154,577,000, awarded to navy yards are the last of the 92 combatant vessels for which congress has provided funds.

The contracts:

Electric Boat Co., Groton, Conn., 13 submarines at $2,795,000 each.

New York Shipbuilding Corp., Camden, N. J., three cruisers to cost $18,657,800 each, exclusive of armor, armament and ammunition.

Bethlehem Steel Co., Quincy, Mass., four cruisers to cost $23,618,000 each and four to cost $18,573,000 each, all exclusive of armor, armament and ammunition.

Bethlehem Steel Co., Staten Island, N. Y., two destroyers to cost $7,431,000 each.

Bethlehem Steel Co., San Francisco, two destroyers at $4,977,000 each.

Federal Shipbuilding & Drydock Co., Kearny, N. J., six destroyers at $7,159,700 each; two destroyers at $8,500,000 each; two destroyers at $5,277,000 each.

Bath Iron Works, Bath, Me., six destroyers at $6,813,000 each.

New York Shipbuilding Corp., one auxiliary seaplane tender at $14,260,500.

Newport News Shipbuilding & Drydock Co., Newport News, Va., three aircraft carriers at $43,662,000 each; two cruisers at $19,272,500 each.

Awards to navy yards: Portsmouth, N. H., five submarines; Mare Island, California, four submarines; Boston, five destroyers; Charleston, S. C., three destroyers; Puget Sound, Bremerton, Wash., two destroyers

Navy department also awarded orders for submarine engines totaling $17,624,521, as follows: General Motors Corp., Cleveland Diesel division, 13 diesels at $720,000 each; Fairbanks Morse Co., Chicago, five diesels at $870,000 each; Hooven Owens, Rentschler Co., Hamilton O., four engines at $939,328 each plus $167,209 for a spare main engine generator set.

Contracts for construction of shipbuilding docks in government navy yards at Philadelphia and Norfolk Va., to cost $16,175,000 were awarded to: Spencer, White & Prentis New York; Foley Bros. Inc., Pleasantville, N. Y.; and Merritt, Chapman & Scott, New York. These construction companies have organized Dry Dock Associates Inc. and will build the docks as a joint venture.

Walsh-Healey Iron and Steel Awards Aggregate $3,391,821

■ IN THE week ended June 22 the government purchased $3,391,821.47 worth of iron and steel products under the Walsh-Healey act as follows:

	Commodity	Amount
Joseph T. Ryerson & Son Inc., Chicago	Steel tubing	$10,066.84
Commercial Iron Works, Portland, Oreg.	Service gates	59,750.00
U. S. Machine Corp., Lebanon, Ind.	Machined shell	35,155.83
Mosler Safe Co., Hamilton, O.	Safes	*16,949.00
Herring-Hall-Marvin Safe Co., Hamilton, O.	Safes	*42,750.00
Diebold Safe & Lock Co., Washington	Safes	*13,781.00
York Safe & Lock Co., York, Pa.	Safes	*44,070.00
Globe Wernicke Co., Washington	Safes	*14,500.00
Shelt Co., Elmira, N. Y.	Iron pipe	23,885.00
Variety Aircraft Corp., Dayton, O.	Ladder assemblies	†9,373.00
Chevrolet Division, General Motors Corp., Detroit	Machined shell	100,850.94
Federal Screw Works, Detroit	Detonator sockets	36,870.00
Reeves Steel & Mfg. Co., Dover, O.	Buckets	20,937.50
Noland Co. Inc., Washington	Plumbing supplies	26,845.44
American Cast Iron Pipe Co., Birmingham, Ala.	Cast iron pipe	24,332.00
Bethlehem Steel Co., San Francisco	Reinforcement bars	54,030.50
Consolidated Steel Corp. Ltd., Los Angeles	Gate hoists	82,000.00
Cuno Engineering Corp., New York	Gasoline filters	15,936.00
American Emblem Co. Inc., Utica, N. Y.	Badges	14,471.25
Emsco Derrick & Equipment Co., Houston, Tex.	Steel towers	27,517.50
Maryland Culvert & Pipe Co., Baltimore	Corrugated pipe	†27,389.02
General Iron Works Co., Denver	Machined shell	115,455.00
Campbell, Wyant & Cannon Foundry Co., Muskegon Heights, Mich.	Steel castings	98,880.00
National Pneumatic Co. Inc., Rahway, N. J.	Guns	1,412,227.95
Chevrolet Division, General Motors Corp., Detroit	Forgings for shell	36,127.20
Hobart Mfg. Co., Troy, O.	Mounts, Telescope	46,099.59
General Electric Co., Federal & Marine dept., Schenectady, N. Y.	Howitzer	552,834.91
Noland Co. Inc., Washington	Pipe	(Indefinite)
The Midvale Co., Philadelphia	Barrels, Gun	428,736.00

*Indefinite. †Estimated.

RFC To Aid Acquisition Of Strategic Materials

■ Under a new amendment to the reconstruction finance corporation act that corporation is empowered to create corporations to acquire and store strategic and critical materials to aid the government in its national defense program. A metals reserve company and a rubber reserve company already have been created, each with a capital of $5,000,000.

The metals reserve company has agreed with the international tin committee, represented by Victor A. Lowinger, London, and John Van den Broek, Batavia, Java, to buy 75,000 tons of tin for a reserve stock. The world supply of tin is controlled by the international tin committee and the agreement calls for an increase in world production of tin so that the reserve can be acquired without interfering with the current demand for tin or affecting the current price. The metals reserve company has agreed to buy its reserve stock at 50 cents a pound, c.i.f. United States ports to be specified by the company.

The RFC has authorized loans to the metals reserve company of $100,000,000 with which to buy and carry the tin and other metals. The tin producing countries, parties to the agreement, are Belgian Congo, Bolivia, French Indo-China, the Malay states, Netherlands East Indies, Nigeria, and Thailand.

The rubber reserve company will acquire and carry a reserve supply of crude rubber, and the metals reserve company will acquire and carry a reserve supply of critical and strategic materials, principally tin and manganese.

The rubber reserve company has

(*Please turn to Page* 32)

June Pig Iron Production Rate Up 9.4 Points to 83.6 Per Cent

■ FURTHER acceleration in steel output during June was reflected by a 9.4 point rise in pig iron production rate, to 83.6 per cent of capacity, as 10 more stacks were blown in. Second consecutive month showing a steady increase over the one preceding, June's production was 9 per cent higher than in May, totaled 3,813,092 net tons, according to reports from operators of the nation's 232 potential blast furnaces.

This was the highest monthly output since January, when 4,024,556 tons was produced, and was largest June total since 1929's 4,160,916 tons. Total production in June, 1939, was 2,373,753 tons, compared with 1,188,037 in corresponding 1938 period and 3,489,138 in June, 1937. Total output last month was 60 per cent greater than in June a year ago.

Average daily production was 127,103 tons, a 12.7 per cent gain over 112,811 tons in May. Highest daily average since January's 129,825 tons, last month's daily output was greatest June average since 1929. Daily average in June, 1939, was 79,125 tons; June, 1938, 39,601 tons, and June, 1937, 116,304 tons.

Aggregate production to July 1 this year totaled 21,042,643 tons, was more than 33 per cent higher than in first half last year, when 14,023,668 tons was produced. Total production in first half of 1938 was 8,882,829 tons; 22,143,895 tons was produced in the same 1937 period.

Daily average for the six months this year was 115,618 tons, about 50 per cent greater than 77,479 tons in the same 1939 period. It was, however, somewhat smaller than 122,341 tons, daily average for first six months in 1937.

Relating production to capacity, June coke pig iron output averaged 83.6 per cent, compared to 51.4 per cent in same month last year, 25.5 per cent in June, 1938, and 76.6 per cent in corresponding 1937 month. Operating rate last month was highest since January, when it was 85.4 per cent; May rate was 74.2 per cent; in April, 68.9 per cent.

Although last month's rate was 7 points higher than in June, 1937, stacks in blast June 30 totaled 181, one less than in the earlier period, when 182 were listed as active. Total of furnaces in blast June 30 was highest since December, 1939, when 191 were active, and represented an increase of 10 over May's total, 171. This compared with 117 in blast June 30, 1939, and 67 in June, 1938.

Thirteen blast furnaces resumed last month, and three were blown out or banked. One merchant stack was blown out and two resumed; two stacks in the steelworks or non-merchant classification were banked or blown out and 11 more resumed.

Furnaces resuming operation in June were:

In Illinois: South Chicago Old E, Carnegie-Illinois Steel Corp.; South Chicago No. 5, Youngstown Sheet & Tube Co. In Minnesota: Zenith, Interlake Iron Corp. In New York: Lackawanna J, Bethlehem Steel Co.; Harriet Y, Wickwire Spencer Steel Co. Inc. In Ohio: Brier Hill No. 1, Youngstown Sheet & Tube Co.; Massillon, River No. 1 and Youngstown No. 2, Republic Steel Corp.; Ohio No. 2, Carnegie-Illinois Steel Corp. In Pennsylvania: Monessen No. 2, Pittsburgh Steel Co.; Duquesne No. 6 and Edgar Thomson H, Carnegie-Illinois Steel Corp.

Stacks blown out or banked were:

In Illinois: Federal B, Interlake Iron Corp. In Michigan: Henry, Ford Motor Co. In Ohio: Mingo No. 2, Carnegie-Illinois Steel Corp.

Missouri blast furnace of Mississippi Valley Iron Co., St. Louis, is being removed from the list of potential furnaces. American Iron and Steel institute includes this unit in its tabulation of "blast furnaces abandoned or dismantled in 1939."

Built in 1869 and last rebuilt in 1920, the Missouri stack has been idle since 1924. It had an annual capacity of 120,960 net tons of basic, foundry and malleable pig iron. With removal of this stack, total potential furnaces in United States is reduced to 232.

Troy Furnace Corp., Troy, N. Y., reports that effective July 1, its plant is being operated by Republic Steel Corp., Cleveland. Plant possesses one stack.

■ Orders received by General Electric Co. during the three months ended June 30 amounted to $115,163,267, compared with $82,188,693 in the same period last year, an increase of 40 per cent.

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
Tot. 6 mo.	21,042,643	14,023,668	8,882,829
July		2,638,760	1,358,645
Aug.		2,979,774	1,674,976
Sept.		3,218,940	1,885,069
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

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		85,121	43,827	126,501
Aug.		96,122	54,031	130,677
Sept.		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.	115,618	96,740	57,962	112,642

JUNE IRON PRODUCTION

Net Tons

	No. in blast last day of June	No. in blast last day of May	—Total Tonnages— Merchant	Non-Merchant
Alabama	17	17	112,334*	151,737*
Illinois	13	12	50,917	286,512
Indiana	16	16	165	441,343
New York	11	9	55,845	188,288
Ohio	40	36	87,776	742,065
Penna.	61	58	89,300*	1,121,807*
Colorado	3	3		
Michigan	4	5		
Minnesota	2	1	6,904*	173,933*
Missouri	0	0		
Tennessee	1	1		
Utah	1	1		
Kentucky	2	2		
Maryland	6	6		
Mass.	0	0	3,031*	301,135
Virginia	1	1		
West Va.	3	3		
Total	181	171	406,272*	3,406,820*

*Includes ferromanganese and spiegeleisen.

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	....	55.0	28.2	82.9
Aug.	....	62.4	34.8	85.7
Sept.	....	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

[1] Based on capacity of 55,628,060 net tons, Dec. 31, 1939; [2] capacity of 56,222,790 net tons, Dec. 31, 1938; [3] capacity of 56,679,168 net tons, Dec. 31, 1937; [4] first 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.

Finished Steel Output Increased in May

■ Finished steel made for sale in May totaled 3,576,860 net tons, compared with 3,005,218 tons in April, as reported by the American Iron and Steel institute. Aggregate production for five months was 17,160,063 tons.

Of the May total 476,761 tons were exported, compared with 371,532 tons in April. Exports for five months were 2,151,107 tons. Shipments to members of the industry for conversion into further finished products amounted to 289,653 tons; in April 191,291 tons. Such shipments for five months totaled 1,154,327 tons.

Production, less shipments for conversion, in May was 3,287,207 tons, equivalent to 72.2 per cent of finishing capacity and for five months 16,005,736 tons, 71.7 per cent of capacity. In April the corresponding figure was 2,813,927 tons at 63.8 per cent of capacity.

Steel sheets showed the largest gain over April, 740,642 tons at 65.9 per cent of capacity against 590,970 tons at 54.3 per cent in April. Bars totaled 544,258 tons at 51.9 per ce in May, 489,234 tons at 48.2 per ce in April. Heavy structural shap made a good seasonal gain, 209,6 tons at 47.5 per cent of capacit compared with 174,006 tons, 40.7 p cent, in April. Cold-reduced tin pla production in May was 210,007 at 84 per cent, in April 197,365 tons, 82 per cent. Plates produced in Ma totaled 281,806 tons, occupying 56 per cent of capacity, compared wit 246,916 tons, 51.4 per cent in Apri

Cold-rolled strip production wa lower in May, 45,229 tons, represen ing 40.6 per cent of capacity, con

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

May - 1940
PERIOD

		Number of companies	Items	Annual Capacity Net tons	Production for Sale—Net Tons: Current Month: Total	Current Month: Per cent of capacity	Current Month: Shipments: Export	Current Month: Shipments: To members of the industry for conversion into further finished products	To Date (5 Months 1940): Total	To Date: Per Cent of capacity	To Date: Shipments: Export	To Date: Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	32	1	xxxxxxx	465,235	xxx	132,927	171,282	1,827,367	xxx	509,317	645,022
	Heavy structural shapes	8	2	5,205,300	209,604	47.5	19,424	xxxxxxx	920,324	42.6	77,079	xxxxxxx
	Steel piling	4	3	328,000	22,318	80.3	3,196	xxxxxxx	62,696	46.0	6,985	xxxxxxx
	Plates—Sheared and Universal	19	4	5,855,450	281,806	56.8	50,584	583	1,406,389	57.8	178,518	12,746
	Skelp	7	5	xxxxxxx	57,531	xxx	5,251	30,048	209,079	xxx	26,417	85,383
	Rails—Standard (over 60 lbs.)	4	6	3,647,600	136,705	44.2	15,394	xxxxxxx	786,342	51.9	41,490	xxxxxxx
	Light (60 lbs. and under)	6	7	306,800	6,718	25.8	4,516	xxxxxxx	40,568	31.8	13,601	xxxxxxx
	All other (Incl. girder, guard, etc.)	2	8	118,000	3,012	30.1	36	xxxxxxx	16,102	32.8	2,306	xxxxxxx
	Splice bar and tie plates	15	9	1,300,200	50,483	45.8	1,006	xxxxxxx	272,909	50.5	4,324	xxxxxxx
	Bars—Merchant	35	10	xxxxxxx	289,299	xxx	36,532	23,759	1,593,877	xxx	153,850	130,272
	Concrete reinforcing—New billet	15	11	xxxxxxx	112,983	xxx	21,938	xxxxxxx	434,584	xxx	122,070	xxxxxxx
	Rerolling	18	12	xxxxxxx	15,436	xxx	240	xxxxxxx	54,168	xxx	3,866	xxxxxxx
	Cold finished—Carbon	18	13	xxxxxxx	46,058	xxx	1,630	xxxxxxx	255,488	xxx	5,542	xxxxxxx
	Alloy—Hot rolled	15	14	xxxxxxx	66,659	xxx	3,419	4,974	340,710	xxx	19,662	23,955
	Cold finished	14	15	xxxxxxx	6,413	xxx	120	xxxxxxx	36,749	xxx	1,099	xxxxxxx
	Hoops and baling bands	5	16	xxxxxxx	7,410	xxx	1,124	xxxxxxx	36,410	xxx	2,965	xxxxxxx
	TOTAL BARS	53	17	12,372,465	544,258	51.9	65,003	28,733	2,751,986	53.5	309,054	154,227
	Tool steel bars (rolled and forged)	15	18	110,220	5,142	55.1	984	xxxxxxx	27,018	59.0	1,927	xxxxxxx
	Pipe and tube—B. W.	13	19	1,737,860	81,459	55.3	6,138	xxxxxxx	343,200	47.5	33,312	xxxxxxx
	L. W.	10	20	1,246,340	27,968	26.5	1,942	xxxxxxx	125,323	24.2	15,344	xxxxxxx
	Electric weld	5	21	731,520	20,087	32.4	1,147	xxxxxxx	92,551	30.5	10,242	xxxxxxx
	Seamless	15	22	3,159,840	141,539	52.9	13,959	xxxxxxx	703,630	53.6	73,718	xxxxxxx
	Conduit	6	23	151,145	5,094	39.8	194	xxxxxxx	26,006	41.4	756	xxxxxxx
	Mechanical Tubing	13	24	554,825	18,955	40.3	1,237	xxxxxxx	108,941	47.3	5,434	xxxxxxx
	Wire rods	19	25	xxxxxxx	75,050	xxx	24,515	12,071	391,581	xxx	99,330	62,575
	Wire—Drawn	37	26	2,255,210	107,662	56.3	12,419	653	543,949	58.1	68,935	6,417
	Nails and staples	19	27	1,091,690	51,242	55.4	6,705	xxxxxxx	225,867	49.8	26,820	xxxxxxx
	Barbed and twisted	16	28	438,270	20,505	55.2	3,981	xxxxxxx	78,638	43.2	13,221	xxxxxxx
	Woven wire fence	15	29	772,790	24,178	36.9	127	xxxxxxx	103,919	32.4	978	xxxxxxx
	Bale ties	11	30	119,050	6,413	63.6	-	xxxxxxx	22,813	46.1	113	xxxxxxx
	All other wire products	6	31	27,030	1,668	72.8	-	xxxxxxx	5,169	46.0	-	xxxxxxx
	Fence posts	13	32	147,485	6,221	49.8	114	xxxxxxx	22,198	36.2	364	xxxxxxx
	Black plate	12	33	653,295	35,118	63.4	2,266	9,565	156,832	57.8	7,868	50,072
	Tin plate—Hot rolled	9	34	1,201,960	38,071	37.4	3,653	xxxxxxx	219,699	44.0	58,929	xxxxxxx
	Cold reduced	10	35	2,930,860	210,007	84.6	33,950	xxxxxxx	961,867	79.0	191,068	xxxxxxx
	Sheets—Hot rolled	26	36	xxxxxxx	410,190	xxx	40,011	25,064	2,061,617	xxx	207,817	75,866
	Galvanized	16	37	xxxxxxx	103,870	xxx	11,215	xxxxxxx	500,255	xxx	73,058	xxxxxxx
	Cold rolled	18	38	xxxxxxx	183,046	xxx	5,315	xxxxxxx	908,770	xxx	37,263	xxxxxxx
	All other	15	39	xxxxxxx	43,536	xxx	2,138	xxxxxxx	232,592	xxx	10,582	xxxxxxx
	TOTAL SHEETS	27	40	13,255,610	740,642	65.9	58,679	25,064	3,703,234	67.2	328,720	75,866
	Strip—Hot rolled	24	41	3,525,110	110,597	37.0	5,415	11,654	554,335	37.9	31,745	62,019
	Cold rolled	35	42	1,313,360	45,229	40.6	1,035	xxxxxxx	274,169	50.2	7,110	xxxxxxx
	Wheels (car, rolled steel)	5	43	419,035	11,946	33.6	317	xxxxxxx	85,699	49.2	2,262	xxxxxxx
	Axles	5	44	472,280	3,886	9.7	94	xxxxxxx	36,002	18.3	1,627	xxxxxxx
	Track spikes	11	45	327,275	9,526	34.4	553	xxxxxxx	49,192	36.2	2,193	xxxxxxx
	All other	3	46	9,100	985	127.8	-	xxxxxxx	4,529	119.8	-	xxxxxxx
	TOTAL STEEL PRODUCTS	133	47	xxxxxxx	3,576,860	xxx	476,761	289,653	17,160,063	xxx	2,151,107	1,154,327
	Estimated total steel finishing capacity based on a yield from ingots of 68.9 %	-	48	53,714,800	xxxxxxx	72.2	xxxxx	xxxxxxx	xxxxxxx	71.7	xxxxxxx	xxxxxxx
	Pig iron, ferro manganese and spiegel	27	49	xxxxxxx	403,329	xxx	40,786	88,980	2,113,173	xxx	135,223	519,981
	Ingot moulds	4	50	xxxxxxx	32,133	xxx	495	xxxxxxx	155,596	xxx	1,177	xxxxxxx
Iron Products	Bars	10	51	160,600	2,142	15.7	7	123	11,489	17.2	86	892
	Pipe and tubes	3	52	109,377	3,018	32.6	15	xxxxxxx	14,240	31.3	460	xxxxxxx
	All other	5	53	71,180	945	15.7	38	219	5,015	17.0	849	1,377
	TOTAL IRON PRODUCTS (ITEMS 51 to 53)	12	54	276,247	6,105	26.1	60	342	30,744	26.8	1,395	2,269

Total Number of Companies Included 153

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current month 3,287,207 *N.T.;* 72.2 *% of Finishing Capacity.*
To date 16,005,736 *N.T.;* 71.7 *% of Finishing Capacity.*
The above tonnages represent 68.9 *% of the ingots produced by companies whose products are included above.*

pared with 51,852 tons, 48.1 per cent in April. Rolled and forged tool steel bars also declined from April, 5142 tons, compared with 5280 tons.

The May statement by the institute is the second report on a monthly basis, former issues having been quarterly. For this reason comparisons with five months in 1939 are not available.

Foundry Equipment Index on New Base

■ May index of foundry equipment orders stands at 127.5 for new equipment, 133.9 for repairs, and 129.1 for total sales, according to reports by 24 companies to the Foundry Equipment Manufacturers' association, Cleveland.

Index of total sales in 1940, by months: January, 149.0; February, 135.7; March, 183.2; April, 145.2.

These indices are based monthly on averages of reported sales to the metalworking industries during 1937-1939. A practical comparison of figures with old base, 1922-1924, can be obtained by multiplying the new base figures by 1.328.

Woodward Iron Co. Earns $439,109 in Second Quarter

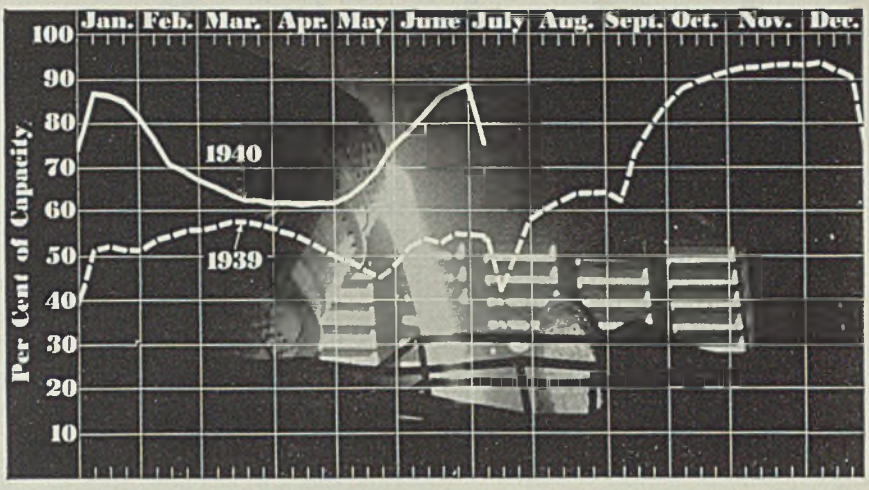
■ Woodward Iron Co., Woodward, Ala., reports $439,109 net income for second 1940 quarter ended June 30. This was equal to $1.47 a share on par $10 capital stock, and compares with indicated net profit of $56,929 or 21 cents per share on capital stock in corresponding 1939 period.

First 1940 quarter net profit was $392,076, equal to $1.36 per share. Net profit for six months ended June 30 totaled $825,186, equal to $2.77 per share, compared to $237,050 or 87 cents a share in same 1939 period.

Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., reports $780,240 net profit earned during year ended April 30, and equal to $1.62 per share on common after preferred dividend requirements. This compares with net income of $227,432 or 29 cents per common share for year ended April 30, 1939.

Midyear Convention of Scrap Group in Buffalo

□ Practically every committee and the national board of directors will meet during the midyear convention of the Institute of Scrap Iron and Steel Inc. at Hotel Statler, Buffalo, July 22-23. Committees will confer on the first day and report their recommendations to a general convention session on the morning of the second day. The annual golf tournament is to be played in the afternoon and the dinner served in the evening.



PRODUCTION... Down

■ STEELWORKS operations last week dropped 14 points to 75 per cent due to the observance of Fourth of July. Last year the rate was 42 per cent, representing a holiday loss of 12 points; two years ago it was 28 per cent.

St. Louis—Dropped 18½ points to 52 per cent as one producer took off an open hearth.

Chicago — Off 15 points to 77 per cent.

Detroit — Lost 13 points to 79 per cent as one producer stopped all open hearths over the week-end. The other continued without interruption.

Cincinnati — Receded 27 points to 54 per cent, one producer being down all week.

Cleveland — Reduced 16½ points to 69 per cent, some open-hearth capacity being taken off and most producers idle Thursday.

Pittsburgh — Curtailed 18 points to 64 per cent because of holiday shutdown. This week a rebound to above 80 per cent is expected.

Wheeling — Off 15 points to 75 per cent, with return to former level expected this week.

New England — Declined 5 points to 80 per cent over the Fourth but closed the week at 85 per cent.

Birmingham, Ala. — Down 17 points to 71 per cent for the week. This week addition of an open hearth will carry the rate to 92 per cent, a gain of 4 points over the pre-holiday level.

Buffalo — Loss of one open hearth and holiday interruption brought production down 16½ points to 74 per cent. Rebound to about 90 per cent is expected this week.

Central eastern seaboard—Slipped 11 points to 72 per cent by idleness Thursday, most plants resuming Friday at the previous schedule.

Youngstown, O. — General observance of Independence Day brought the rate down 10 points to 70 per cent for the week, with probability it will resume the former level this week.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended July 6	Change	Same week 1939	Same week 1938
Pittsburgh	64	—18	26	15
Chicago	77	—15	44.5	24
Eastern Pa.	72	—11	32	22
Youngstown	70	—10	38	27
Wheeling	75	—15	62	44
Cleveland	69	—16.5	27.5	15.5
Buffalo	74	—16.5	32.5	30
Birmingham	71	—17	65	42
New England	80	— 5	32	33
Cincinnati	54	—27	28	36
St. Louis	52	—18.5	31	33.3
Detroit	79	—13	56	29
Average	75	—14	42	24

Steel Payrolls Up 11 Per Cent in Month

■ Employment and payrolls of the steel industry rose during May, according to the American Iron and Steel institute, New York.

An average of 510,000 employes was at work in May, compared to 503,000 in April. Total payrolls in May amounted to $75,184,000, compared to $67,724,000 in April, an increase of 11 per cent. May, 1939, employment in the steel industry averaged 448,000 and payrolls totaled $60.372,000.

Wage-earning employes in the industry worked an average of 35.7 hours a week in May, 33.4 hours in April and 32.7 in May, 1939.

Earnings of wage employes averaged 85.1 cents an hour in May, compared to the April average of 83.6 cents and the May, 1939, average of 83.5 cents.

Steel and Iron Exports in May Highest in Twenty Years

■ STEEL and iron exports, excluding scrap, reached their highest level in 20 years when in May a total of 471,481 gross tons valued at $31,217,378 was dispatched from this country to foreign buyers, according to the metals and minerals division, department of commerce. Twenty per cent above the April trade of 391,754 tons valued at $29,223,257, May 1940 exports were more than three times as great as those of May, 1939, 147,760 tons valued at $11,661,926.

Five months cumulative exports—2,152,936 tons valued at $159,176,055—fall just short of being three times as large as the trade of the January-May period of 1939, with 733,307 tons valued at $56,464,410.

Shipments to every continental area except the Far East rose in May as compared with April. Sharply increased shipments to the United Kingdom lifted the total of exports to Europe to the high level of 192,744 tons as compared with 137,583 tons in April. Canada accounted for the greater part of the increase in the trade with North and Central America and the West Indies—to 80,812 tons from 65,935 tons in the month preceding.

Reaching a total of 8549 tons valued at $1,026,425, imports of iron and steel registered their second successive monthly increase in May. Receipts of these products in April had totaled 6192 tons valued at $544,608 and in May 1939 had amounted to 24,171 tons valued at $1,405,983. Eighty-nine per cent of the May 1940 receipts was ferroalloys, chiefly spiegeleisen, 5877 tons, while Canada was the source of 7081 tons or 82 per cent of total imports.

Cumulative imports for the first five months of 1940 were only fractionally as great as those of the comparable period of 1939. In that year this trade had amounted to 132,141 tons valued at $8,538,802, whereas in 1940 only 34,107 tons valued at $3,969,234 entered the country.

Scrap Exports Also Gain

Exports of scrap from the United States continued to rise in May when a total of 312,483 tons valued at $5,109,424 moved to foreign buyers. This was an increase of some 40 per cent over the April trade of 221,152 tons valued at $3,575,940, but fell far short of the 384,881-ton $5,638,013 trade of May 1939. Included in the May 1940 total was 310,069 tons of iron and steel scrap of which 98,652 tons went to Italy, 66,860 tons to Japan, 63,919 tons to the United Kingdom, 49,369 tons to Canada, and 11,446 tons to Switzerland.

Despite the increases recorded in the April and May export trade in scrap the 1940 five-months trade in these materials—1,162,736 tons valued at $19,867,357—is still well below the 1,390,064-ton, $20,570,577 trade of the January-May period, 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	8,582	532,641	28,142
June			588,856	32,587
July			513,664	30,851
Aug.			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

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	May 1940	April 1940	January through May 1940
Pig iron	23,606	16,285	100,021
Ferromanganese and spiegeleisen	3,431	111	9,320
Other ferroalloys	759	312	2,770
Ingots, blooms, etc.:			
Not containing alloy	129,304	79,551	413,717
Alloy, incl. stainless	3,960	553	8,683
Steel bars, cold fin.	3,210	4,050	18,752
Bars, iron	471	251	6,998
Bars, concrete	8,421	9,090	69,645
Other steel bars:			
Not containing alloy	36,901	29,364	151,987
Stainless steel	156	137	496
Alloy, not stainless	2,805	3,176	11,099
Wire rods	16,796	15,516	75,148
Boiler plate	802	940	4,758
Other plates, not fab.:			
Not containing alloy	35,716	40,430	165,104
Stainless steel	25	40	129
Alloy, not stainless	301	219	1,224
Skelp iron or steel	4,799	989	20,131
Sheets, galv. iron	847	412	3,742
Sheets, galv. steel	10,961	13,600	70,628
Sheets, "black" steel:			
Not containing alloy	31,999	32,573	177,655
Stainless steel	62	198	828
Alloy, not stainless	308	1,098	3,059
Sheets, black iron	1,839	1,624	14,613
Strip steel, cold-rolled:			
Not containing alloy	3,645	2,906	20,257
Stainless steel	44	54	272
Alloy, not stainless	29	56	168
Strip steel, hot-rolled:			
Not containing alloy	8,560	9,816	53,440
Stainless steel	1	20	42
Alloy, not stainless	45	52	239
Tin plate, taggers' tin	29,537	32,306	231,163
Terne plate (including long ternes)	727	159	2,440
Tanks, except lined	1,477	4,299	11,648
Shapes, not fabricated	15,766	19,864	79,918
Shapes, fabricated	6,650	3,873	29,598
Plates, fabricated	1,063	692	7,302
Metal lath	228	84	720
Frames and sashes	373	106	850
Sheet piling	1,009	534	3,765
Rails, 60 lbs.	11,589	1,828	38,021
Rails, under 60 lbs.	4,100	2,160	9,291
Rails, relaying	1,182	1,708	5,898
Rail fastenings	1,333	400	4,423
Switches, frogs, crsgs.	169	189	1,840
Railroad spikes	523	273	2,324
R.R. bolts, nuts, etc.	297	71	1,068
Boiler tubes, seamless	1,446	1,658	8,953
Boiler tubes, welded	158	248	874
Pipe:			
Seamless casing and oil-line	11,198	11,313	57,274
Do., welded	1,472	5,153	18,663
Seamless black	2,054	1,011	12,523
Pipe fittings:			
Mall. iron screwed	291	436	2,133
Cast-iron screwed	239	198	1,151
Pipe and fittings for:			
Cast-iron pressure	9,783	1,746	21,520
Cast-iron soil	1,752	1,020	5,853
Pipe, welded:			
Black steel	2,401	2,347	14,887
Black wrought-iron	347	663	2,338
Galvanized steel	4,422	4,171	22,283
Galv. wrought-iron	294	515	2,950
All other pipe, fittings	830	672	6,533
Wire:			
Plain iron or steel	5,991	6,470	36,072
Galvanized	5,596	5,304	21,464
Barbed	3,552	2,145	11,911
Woven-wire fencing	486	339	1,991
Woven-wire screen cloth:			
Insect	67	43	267
Other	195	182	974
Wire rope and cable	1,065	754	4,344
Wire strand	78	77	565
Electric welding rods	251	273	1,387
Card clothing	1	2	6
Other wire	1,104	2,061	7,715
Wire nails	3,834	4,414	22,135
Horseshoe nails	26	102	398
Tacks	57	70	336
Other nails, staples	554	373	1,914
Ordinary bolts, machine screws	1,496	1,280	6,241
Castings:			
Gray iron (incl. semisteel)	415	299	1,911
Malleable-iron	221	130	807
Steel, not alloy	165	104	915
Alloy, incl. stainless	57	50	698
Car wheels, tires, and axles:			
Wheels and tires	1,068	873	5,243
Axles, no wheels	248	137	963
Axles with wheels	2	694	781
Horseshoes and calks	34	38	182
Forgings, n.e.s.:			
Not containing alloy	1,730	2,008	8,775
Alloy incl. stainless	675	412	1,872
Total	471,481	391,754	2,152,936
Scrap, iron and steel	310,069	218,778	1,152,341
Scrap, tin plate	165	798	2,533
Tin plate circles, strips, cobbles, etc.	290	530	2,133
Waste-waste tin plate	1,849	748	4,587
*Terne plate clippings and scrap	110	298	1,142
Total scrap	312,483	221,152	1,162,736
GRAND TOTAL	783,964	612,906	3,315,672
Iron ore	86,075	369	89,748

*New class.

May Machinery Exports Slightly Under April

■ Industrial machinery exports in May were valued at $36,682,663, slightly lower than the $40,613,284 value reached in April and $37,559,841 in March, according to the machinery division, department of commerce. The May figure was 41 per cent larger than the May, 1939, value of $26,085,746.

Power-driven metalworking machinery exports were valued at $19,142,225, compared with $21,281,332 in April, but were 65 per cent larger than in May, 1939, when they were valued at $11,615,799. Metalworking machinery other than power-driven

was exported to the value of $681,920, or 66 per cent more than in May, 1939. Construction and conveying machinery exports were valued at $2,922,010, an increase of 62 per cent over the corresponding month in 1939. Power generating equipment showed a 38 per cent increase and textile, shoe and sewing machinery 14 per cent. Mining, well and pumping equipment exports were valued at 14 per cent less than in May, 1939.

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS
Gross Tons

Articles	May 1940	April 1940	January through May 1940
Pig iron	317	286	5,132
Sponge iron	.....	368	609
Ferromanganese (1)	971	1,408	6,754
Spiegeleisen	5,877	99	6,241
Ferrochrome (2)	.....	1	1
Ferrosilicon (3)	769	63	1,204
Other ferroalloys (4)	.....	26	190
Steel ingots, blooms	3	.....	3
Billets, solid or hollow	.....	45	406
Concrete reinforce. bars	.....	.....	7
Hollow bar, drill steel	31	183	785
Bars, solid or hollow	82	536	1,638
Iron slabs	.....	.....	.....
Bar iron	5	31	194
Wire rods	.....	1,382	3,848
Boiler and other plate (including skelp)	2	.....	6
Sheets, skelp, saw plate	15	8	80
Die blocks, blanks, etc.	1	3	12
Tin plate, taggers' tin and terne plate	14	11	51
Structural shapes	107	46	687
Sashes and frames	.....	.....	.....
Sheet piling	.....	.....	.....
Rails, track material	44	13	354
Cast-iron pipe, fittings	.....	.....	419
Mall.-iron pipe fittings	.....	2	2
Welded pipe	.....	.....	.....
Other pipe	91	565	1,873
Cotton ties	.....	.....	2
Other hoops and bands	30	112	599
Barbed wire	.....	44	44
Round iron, steel wire	1	277	768
Teleg., telephone wire	.....	.....	.....
Flat wire, steel strips	60	392	1,255
Wire rope and strand	50	60	370
Other wire	1	.....	1
Nails, tacks, staples	12	17	95
Bolts, nuts, and rivets	20	24	121
Horse and mule shoes	.....	.....	3
Castings and forgings	46	190	353
Total	8,549	6,192	34,107
Iron and steel scrap	33	482	1,259
GRAND TOTAL	8,582	6,674	35,366

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

Electrical Exports Show Moderate Rise

■ United States exports of electrical equipment in May were valued at $12,089,165, 2.3 per cent more than the April trade of $11,811,777, and 34.7 per cent over May, 1939, according to the electrical division, department of commerce.

Five months' exports aggregated $58,222,623, a 34.3 increase over value of $43,354,568 in the corresponding 1939 period. Foreign household refrigerator sales in May totaled $815,458; commercial electric refrigerators, $150,336; radio receiving sets, $779,732; alternating current generators, $155,919; direct-current generators, $43,220; rubber-covered copper wire, $1,319,492. Decreases were noted in exports of portable electric tools, self-contained lighting outfits, electric household washing machines and electric razors.

Farm Equipment Exports Gain 46% in Month

■ United States exports of farm equipment in May were valued at $9,555,833, an increase of 46 per cent over $6,548,384, the value in May, 1939. Practically all classes shared in the gain, tillage implements and tractors, parts and accessories showing the largest increases, as reported by the machinery division, department of commerce.

Tillage implements were 66 per cent larger, tractors, parts and accessories 48 per cent greater, harvesting machinery only 2 per cent larger. Exports of other types showed a gain of 75 per cent over May, 1939.

ORIGIN OF MAY IMPORTS
Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Sweden	6,886	.....	.....	.....
United Kingdom	60	..	.....	.....
Canada	13,173	314	.....	.....
Mexico	244	.....	30	.....
Cuba	21,000	.....	7,950	.....
Chile	133,200	.....	1,262	.....
British India	.....	3	9,037	.....
Brazil	.....	.....	3,766	.....
Philippine Islands	.....	.....	2,900	.....
Soviet Russia	.....	.....	27,988	.....
South Africa	.....	.....	6,529	.....
Gold Coast	.....	.....	2,627	.....
Norway	.....	.....	.....	971
Total	174,563	317	62,089	971

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	...	76	...	30
United Kingdom	13	31	...	...
Canada	...	...	6	...
Sweden	2	...	25	...
Total	15	107	31	30

Form Company To Make Kennametal in Canada

■ George H. Alexander Machinery Ltd., Birmingham, England, in conjunction with Philip M. McKenna Metals Co., Latrobe, Pa., have organized Kennametal of Canada Ltd., to manufacture Kennametal, steel-cutting carbide, for Canada and other British dominions. Main office and factory will be in Hamilton, Ont.

Mr. McKenna is president of the firm and Arthur H. Alexander, Victoria, B. C., is general manager. Mr. Alexander is a member of the firm of George H. Alexander Machinery Ltd., manufacturers and importers of machinery and equipment, operating several plants in England. He has been in the United States several months purchasing equipment for the Hamilton factory, to begin operations early in July.

Died:

■ LOUIS E. MURPHY, 66, formerly president and chairman of the board, E. F. Houghton & Co., Philadelphia, June 26 at his summer home at Mantalocking, N. J. He had been with the company 52 years, having started as an errand boy in 1888. He became secretary in 1910; vice president in 1914, and president in 1929. Five years later he was elected chairman, and after his resignation in 1936, continued as a director.

♦

Thomas J. Meehan, 63, vice president and general manager, Meehan Boiler & Construction Co., Lowellville, O., with which firm he had been associated 42 years, June 27.

♦

Ralph Modjeski, noted bridge engineer, in Los Angeles, recently. Mr. Modjeski was holder of some of the highest honors in the engineering profession, including the John Fritz medal, and the Washington prize of the Western Society of Engineers.

♦

Harry T. Smith, traffic manager, Worthington Pump & Machinery Corp., Harrison, N. J., July 3, at his home Metuchen, N. J. Mr. Smith was associated with Worthington 54 years, having started with the old Henry R. Worthington Hydraulic Works, then located at Brooklyn, N. Y.

♦

Raymond A. Sossong, 51, vice president, Air Reduction Corp., New York, June 28 at his home in New Rochelle, N. Y. He had been with Air Reduction the past 23 years.

♦

John Prentice, 57, superintendent, Bayonne, N. J., plant, Babcock & Wilcox Co., in Jersey City, N. J., June 30. He had been associated with the company since 1898, and before going to Bayonne in 1907, was employed in the Barberton, O., plant. He was a member, American Society of Mechanical Engineers.

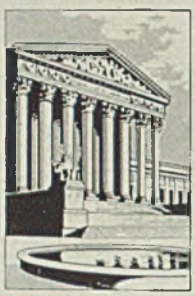
♦

Clarence A. Thatro, 37, vice president in charge of sales and assistant general manager, Trane Co., La Crosse, Wis., recently in La Crosse.

♦

Harold G. Pederson, 46, president, Pederson Tool & Cutter Co., Milwaukee, at his home in Milwaukee, recently. He was a works manager for General Motors Corp., Detroit, before going to Milwaukee five years ago.

Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

Manufacturers' May Business up 9 Per Cent.

President Recommends Graded Excess Profits Tax.

Senate Asks 24-Hour Day for Government Contractors.

Workers on Government Goods May Be Finger-Printed.

WASHINGTON

■ INCOMING business of manufacturers in May showed a distinct upturn from the levels prevailing in earlier months of the year. New business rose about 9 per cent from the April volume with almost all major industries participating in the advance. Most pronounced gains were recorded in the durable goods industries, particularly in iron and steel, according to the department of commerce.

In releasing preliminary figures of its monthly survey of inventories, new and unfilled orders, and shipments, the department pointed out that the strong upward move in orders placed for durable goods was sufficient to bring about a 3 per cent rise in unfilled order backlogs, a substantial gain for this series. Added significance may be attached to this increase in view of the steady month-to-month decline from last October to April of this year.

An equally important development in May was the cessation of manufacturers' inventory liquidation which had first appeared in March and which assumed larger proportions in April. The inventory position of most industries remained steady during May—apart from the automotive industry which experienced a decline of a seasonal character. In the durable goods field, the iron and steel products and transportation equipment industry registered significant advances.

The aggregate value of shipments for all manufacturing industries increased only moderately in May—about 2 per cent from April. Pronounced advances in shipments occurred in a few industries—iron and steel, machinery, paper, and rubber products, but this situation was not general. Shipments of machinery have expanded continuously since last September. Detailed figures will be available later.

New Excess Profits Tax

A message was sent to congress last week by the President recommending the enactment of "a steeply graduated excess profits tax, to be applied to all individuals and corporations without discrimination, to help finance the national defense program."

The message was sent following a conference the President had last week at the White House with congressional leaders.

Majority Leader Rayburn stated at the Capitol that the new tax bill will follow that of the first World war which he said "raised a lot of money."

It will be recalled that when the new tax bill which went into effect on July 1 was being discussed by congress, the conferees rejected an excess tax amendment by Senator La Follette which would have levied up to 40 per cent against the excess profits of corporations.

At that time Chairman Doughton of the house ways and means committee told the house excess profits would be considered between now and the beginning of the new session of congress. Tax conferees directed the treasury to report by Oct. 1 on such a measure.

At the Capitol, Speaker Bankhead said the excess profits tax legislation was designed to prevent creation of "war millionaires." The speaker prefaced this statement with the remark there is little likelihood of an early adjournment of congress.

Urges 24-Hour Work Day

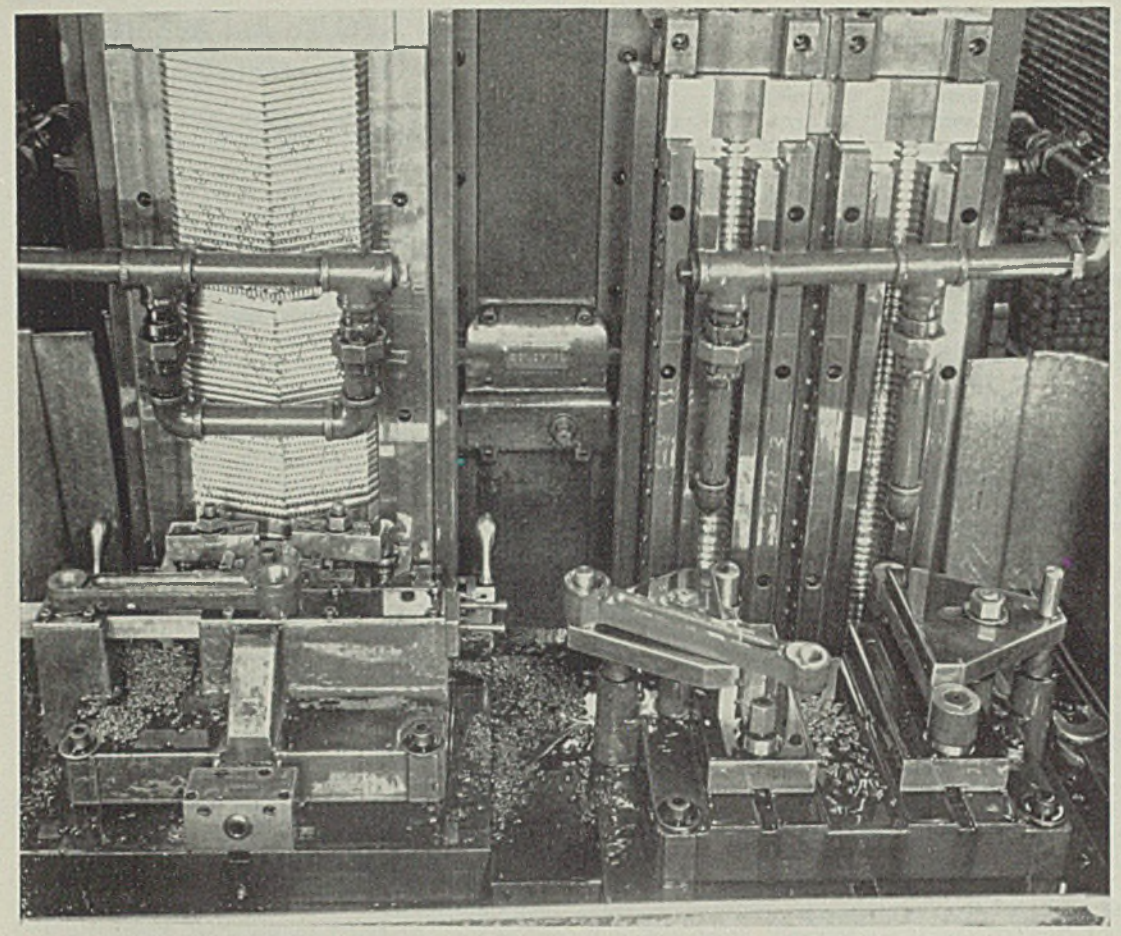
Senator Connally, Texas, has introduced S. Res. 289, expressing sentiment of the senate that to expedite the national defense program, the army and navy should insist on contractors working on a 24-hour day basis.

Resolution which has been referred to the senate committee on military affairs, includes the following: ". . . that all contracts entered into by the United States or any agency thereof . . . should provide for utilizing to the fullest practicable extent the productive capacities of contractors, including employment of personnel in as many shifts as possible during each period of 24 hours."

Finger-Printing for Workers

Representative Rich, Pennsylvania, has introduced H. R. 10145 bill in the house, designed to prevent sabotage by requiring that all persons employed in connection with government goods shall be registered, photographed, fingerprinted, and "otherwise permanently identified as a necessary requisite and condition of employment."

Every manufacturer of government goods is required under the bill to furnish department of justice with full information concerning any employe, "under such rules and regulations as the department of justice may establish." For protection of employes, bill provides that the department shall furnish to each



BROACHING PAYS in Aircraft Quantities

ARTICULATED RODS CONTOUR-BROACHED IN 5 OPERATIONS ON ONE MACHINE

SEQUENCE OF OPERATIONS

1. Broach face, channel side, and face on bosses.
2. Reverse rod and broach opposite side and faces with same tooling.

Change fixtures and tooling, and

3. Broach one flat arm face.
4. Reverse rod and broach opposite side with same tooling.
5. Simultaneously with (3) and (4) contour broach large and small ends of rods.

Capacity 100-120/hour per operation per ram.

Machine used: Colonial Dual Ram with interchangeable fixtures and tooling by Colonial.

Machining all sides of the entire outer surface of aircraft connecting rods (except the channel recess) is today being accomplished on a single broaching machine, eliminating costly and slow contour milling.

Indicative of the flexibility of modern broaching equipment, the Colonial Dual Ram used at Wright Aeronautical Corporation for this purpose performs five operations with but a single change in tools and fixtures.

In process, a quantity of rods go through the first two operations. When a stock has been built up, tools and fixtures are changed, and the remaining three operations are performed simultaneously—and the rod which started as a rough forging, is ready for "touch-up" finish grinding.

If you have a form-machining problem it will pay you to have Colonial's Engineering Department study it. There is no charge for this service—and the cost per piece may surprise you.

Are you receiving 'Broaching News'? If not, a note on your company letterhead will place you on the mailing list.

COLONIAL BROACH COMPANY • 147 Jos. Campau, DETROIT, MICH.

employe, "an identification card containing an abstract, photograph, and fingerprints of the individual and also file with the social security board a photostatic copy of same."

Bill has been referred to the house committee on judiciary.

BUREAU OF MINES TO PRODUCE MANGANESE

Supplemental appropriations bill for national defense, signed by the President, provides $47,500,000 for acquisition of strategic and critical materials to be available immediately.

Bill has a provision of $2,000,000 for the bureau of mines "for erection, equipment, and operation of a pilot plant or plants for beneficiation of manganese ores and production of metallic manganese therefrom by electrolytic or other process, including personal services and other expenses . . . requisite for and incident to exploration of manganiferous deposits."

R. E. W. HARRISON TO AID NAVAL PROCUREMENT

R. E. W. Harrison, vice president, Chambersburg Engineering Co., Chambersburg, Pa., also a naval reserve officer with rank of lieutenant commander, has been called to active duty in the office of the assistant secretary of the navy. He will aid procurement of machinery by the government.

During 1934-35 Commander Harrison was chief of the machinery division of the department of commerce and inspected the machine tool equipment of all continental navy yards.

PRESIDENT APPROVES HILLMAN YOUTH PROGRAM

Presidential approval to the plan of Sidney Hillman, national defense commissioner in charge of labor, to train ultimately 1,500,000 youths for the defense program was given last week. A project to train 150,000 will be put into effect immediately, according to Mr. Hillman.

The works progress administration will allocate 50,000 trainees to the program and the remainder will be selected through state employment services co-operating with the United States employment service, and from among workers now in industry who wish to improve their skill.

This program will be purely on a voluntary basis and has no relation to the proposal recently emanating from the administration for compulsory youth training—a proposal which lost favor when it was dubbed a "Hitler Youth" project.

The voluntary training program will be financed by two funds—an allotment of $9,781,340 from WPA and $7,500,000 from the office of education of the federal security agency, which is co-sponsor with the defense commission.

Floyd W. Reeves, Mr. Hillman's executive assistant for labor supply, will have charge of co-ordinating the training facilities. Mr. Reeves is director of the American Youth committee, a non-governmental agency of which Owen D. Young is chairman.

Among those acting with Mr. Reeves in an advisory capacity are: Arthur J. Altmeyer, chairman, social security board; Clara Bayer, chairman, apprenticeship committee of the department of labor; Wayne Coy, assistant administrator, federal security agency; Isador Lubin, commissioner of labor statistics of the department of labor, who has been assigned to Mr. Hillman's staff as an executive assistant; J. J. McEntee, director of the C. C. C.; Major Frank J. McSherry of the general staff, war department; Fred R. Rauch, assistant commissioner in charge of the division of employment, W. P. A.; John W. Studebaker, commissioner, U. S. office of education; and Aubrey Williams, administrator of the N. Y. A.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has inaugurated a training program for skilled mechanics and machine operators. Retired employes will be re-employed on part or full time to serve as instructors.

STATE DEPARTMENT SETS UP NEW FOREIGN TRADE BUREAU

State department has organized a division of commercial treaties and agreements to function under an assistant secretary of state which will supervise international commercial relations and cooperate in formulation of international commercial policy. Division will be responsible for department's correspondence with export and import interests, our representatives abroad, and with foreign representatives in this country. It will interpret and enforce commercial treaties and agreements and will enlist collaboration of other divisions of the department, particularly those formulating policies.

Harry C. Hawkins has been designated chief of the division with Henry L. Deimel Jr., and William A. Fowler, as assistants.

HOLLAND APPOINTED ACTING STATISTICS BUREAU HEAD

Thomas Holland, public contracts board chairman, has been appointed acting director of the research and statistics branch, labor department's wage and hour division. Mr. Holland will replace N. Arnold Tolles, who has been loaned to the national defense advisory committee.

RFC To Aid Acquisition Of Strategic Materials

(*Concluded from Page* 24)

agreed with the international rubber regulation committee, represented by Sir John Hay, that it will buy a reserve stock of rubber of 150,000 tons over a period of months, at a price range basis between 18 and 20 cents a pound, c.i.f. New York. This 150,000 tons, with the 85,000 tons recently acquired through the barter agreement with Great Britain in exchange for cotton, will provide a reserve supply of rubber in the United States of approximately 235,000 tons, in addition to current stocks held by the industry.

Limited Competitive Bidding

The capital of the rubber reserve company will be owned one-half by the RFC and one-half by the principal rubber manufacturers, and the reserve supply will be acquired from additional production of rubber allowed by the international rubber regulation committee as a result of this contract, so that there will be no lack of rubber to meet current demands, and no occasion for unusual competitive bidding by the industry for normal requirements.

The RFC has authorized loans to the rubber reserve company of $65,000,000 to purchase and carry the rubber. The rubber producing countries are Malaya, Netherlands Indies, French Indo-China, India, Burma, North Borneo, Sarawak, and Thailand.

PRESIDENT TO ASK FOR ANOTHER $5,000,000,000

Request for an additional $5,000,000,000 for national defense purposes will be sent to congress by the President early this week, congressional leaders predict. Four billion will be asked for the army and one billion for the navy.

If congress approves the defense program expansion—and it is expected to do so—the total appropriated this year will be more than $10,000,000,000.

The $4,000,000,000 asked for the army will be used largely for buying tanks, airplanes, armored trucks and similar mechanized equipment. It is understood $1,500,000,000 will be earmarked for army airplanes alone. Program also contemplates at least 3000 tanks.

Meanwhile the senate naval affairs committee last week approved the latest navy expansion bill providing a 70 per cent increase in the fighting fleet—or about 200 warships. This bill already had passed the house without a dissenting vote and is expected to receive favorable action in the senate during this week.

Lacquered Black Plate for Containers, To Save Tin

PITTSBURGH

■ TIN PLATE producers have devoted considerable attention to conditions affecting their product which might arise during war periods. Principal problem facing them would be two-fold. First, tin is a strategic mineral which does not exist within United States in commercial quantities; second, tin can requirements for our armies at wartime strength would seriously impair available volume of tin, and would divert it from other needs.

Much work has been done in an effort to solve the problem. Substitute containers and substitutes for tin as a covering for steel in containers have been sought. Since all our tin must be imported, the work was largely devoted to discovery of tin substitutes, that large quantities of the metal might be released for other purposes. Considerable success has attended the effort.

Louis Johnson, assistant war secretary, recently asked Institute of Food Technologists to find a substitute for tin containers, to release tin stores for other war needs. Steel companies had already been working on the problem for some time. Silver, instead of tin, was recently suggested by a prominent metallurgist as a coating material. Estimates as to its increased cost have varied from one to three cents per can.

Lacquer Coat Protects Foods

Tin plate men, however, insist a lacquered black plate can is the logical answer. Tin's major contribution to container manufacture, they assert, lies in the fact it facilitates soldering and joining operations, removing necessity for chemically cleaning surfaces in order to provide a tight joint. Container's enhanced appearance, adding to its sales value, is another important reason for its use. Latter point, obviously, would not apply for army requirements.

Food preservation, popularly but fallaciously ascribed principally to the tin coating of containers, would be as well provided by a good lacquered interior. Nearly all food cans now used depend on lacquer rather than tin for food protection.

Although glass, paper and plastics have made some inroads on the tin plate container industry, there is little possibility that any would be durable enough to serve as army containers. That type of material, however, might well be used for domestic consumption should it be found desirable to release tin for army packing only.

Steel research workers have made some progress in developing an electric joining process that will weld cans, eliminating necessity for tinning. Electricity may also play an important part through extended use of electrolytic tin plating process, now almost universally used and reducing tin required per can.

Aluminum containers have been used in several applications. Commercially this venture has been unprofitable on all but highest quality products, due to materials cost. Process is feasible, however, and would reduce containers' weight materially, in addition to releasing tin for other applications.

War Interferes With World Tin Statistics

■ Statistical office of International Tin Research and Development council at The Hague has ceased to function since the invasion of Holland and the monthly statistical bulletin for May did not appear. Publication has been resumed with an abridged edition issued from the council's head office at Greenford, Middlesex, England.

World production in May is estimated at 17,300 tons, against 13,500 tons in April. Five months' production this year was approximately 83,100 tons compared with 55,700 tons in the corresponding months of 1939.

Reliable estimates of world tin consumption are impossible as statistics from many countries are not available. Tin consumption in the United Kingdom totaled 9695 tons in the first four months this year, against 6680 in the comparable period, 1939, an increase of 45 per cent. Deliveries to United States consumers in five months totaled 41,384 tons, compared with 25,075 in the 1939 period, an increase of 65 per cent.

Seven Tons of Tin Stolen

■ General appreciation of tin's strategic importance and value was demonstrated at Cleveland last week when four armed and masked robbers stole 14,175 pounds of tin ingots from American Steel & Wire Co.'s vault. Utilizing one of the company's acetylene torches to open the vault, thieves used two automobiles to cart away 135 ingots weighing 105 pounds each. Value of the tin was placed at $6700.

Two company watchmen, taken by surprise, were menaced and placed in a locker room. The robbers apparently were well acquainted with the factory's environs. Possibility a metal-stealing ring is operating near Cleveland was indicated by recent theft of 50 tin bars from B. F. Goodrich Co., Akron, O.

Wagner Elected President Of Malleable Founders

■ Election of John A. Wagner, president, Wagner Malleable Iron Co., Decatur, Ill., as president of the Malleable Founders' society, to succeed Frank O. Parker, sales manager, Acme Malleable Iron Co., Buffalo, was announced at the annual meeting of the society in White Sulphur Springs, W. Va., June 27-28.

R. R. Fauntleroy, president, Moline Malleable Iron Co., St. Charles, Ill., is the new vice president. Robert E. Belt, 1800 Union Commerce building, Cleveland, was re-elected secretary-treasurer.

Directors were elected at recent sectional meetings as follows:

Western section: C. L. Carter, president and general manager, Albion Malleable Iron Co., Albion, Mich.; C. A. Gutenkunst Jr., president, Milwaukee Malleable & Gray Iron Works, St. Charles, Ill.; Messrs. Fauntleroy and Wagner.

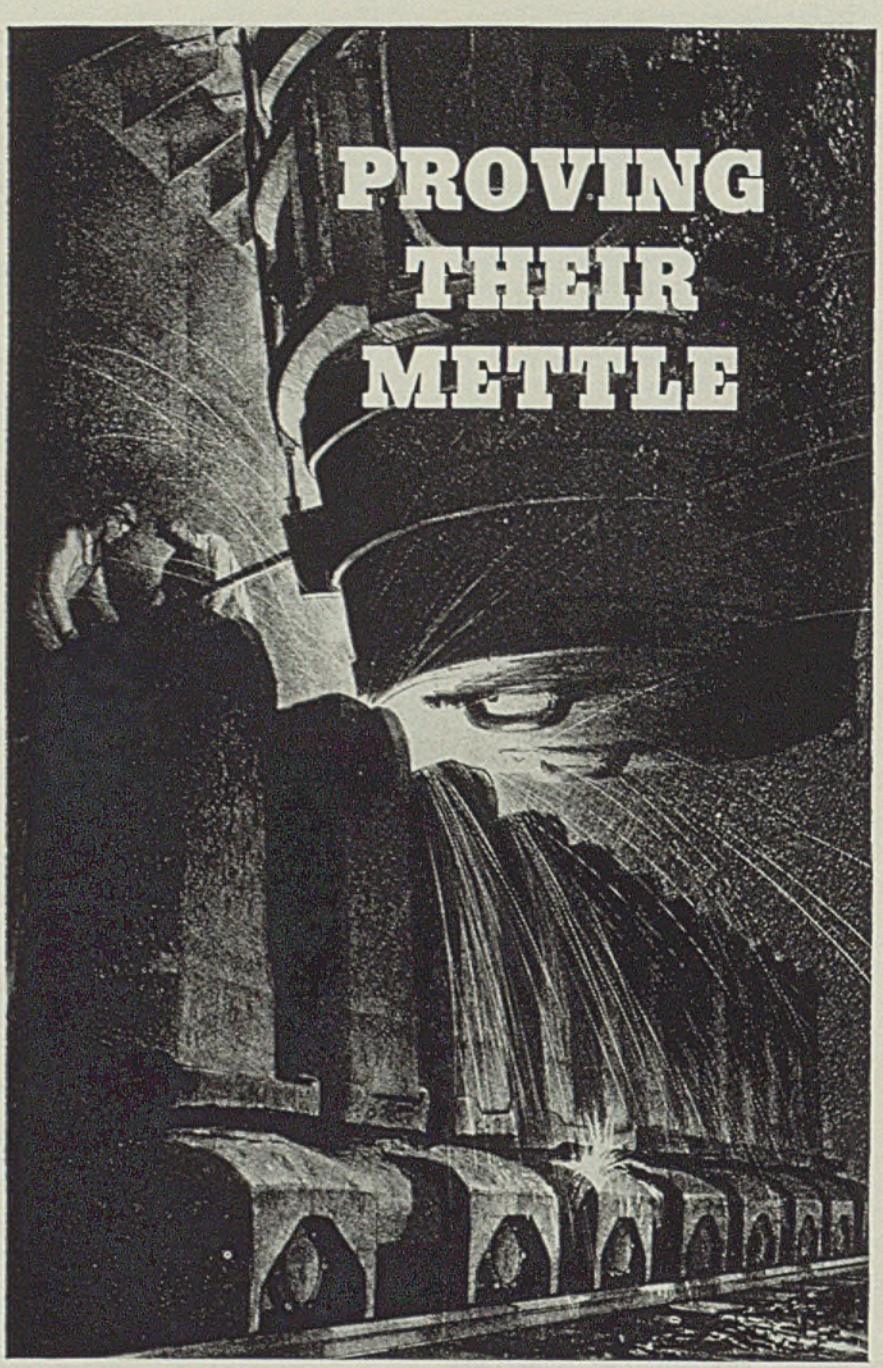
Central section: Anthony Haswell, vice president, Dayton Malleable Iron Co., Dayton, O.; A. F. Jackson, vice president and general manager, Michigan Malleable Iron Co., Detroit; H. A. Marti, secretary-treasurer and general manager, Maumee Malleable Iron Co., Toledo, O.; C. H. McCrea, manager of Cleveland works, National Malleable & Steel Casting Co., Cleveland.

Eastern section: H. Nelson Albright, manager, Columbia Malleable Castings Corp., Columbia, Pa.; L. A. Dibble, president, Eastern Malleable Iron Co., Naugatuck, Conn.; F. C. Tuttle Jr., manager, Belcher Malleable Iron Co., Easton, Mass.; and Retiring President Parker.

The meeting was concerned chiefly with activities of the society and plans for future work.

Enrique Touceda, Albany, N. Y., the society's consulting engineer, contributed a paper, "An Unusual Structure in Malleable Iron," which related to the rare occurrence of the so-called inverse chill in malleable iron. Prof. Touceda indicated his belief that in malleable an inverse chill results from bled castings.

James H. Lansing, Cleveland, the society's shop practice engineer, reported on a melting refractory study. Among other items, the field of the brick bottom was indicated to be in large air furnace or duplex operation.



Lithographed on stone by James E. Allen

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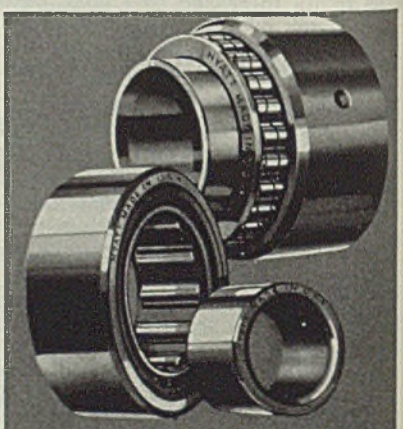
● **HYATTS ARE ALWAYS READY** to work for you! For the new equipment you will buy, or for contemplated change-overs, let us help you on your bearing applications.



HYATT
ROLLER
BEARINGS

Mirrors of MOTORDOM

By A. H. ALLEN
Detroit Editor, STEEL

4,200,000 Cars for Current Model Year.

Ten Months Output 24 Per Cent Above 1939.

Die Castings, Material Costs Increasing.

Packard Raises Prices To Cover Tax Boost.

General Motors To Double Diesel Production.

DETROIT

■ TEN months of production on 1940 models have gone into the record and indicated total output of cars and trucks built in the U. S. and Canada is just under 3,900,000. Add another 300,000 for probable July and August output and you have the total for the model year —4,200,000. In the same ten months of 1939 model production the total output was 3,158,018, which means that the gain registered this year is around 24 per cent.

Total production for June is estimated at 366,800, about 12 per cent ahead of the 324,253 figure for June a year ago, but 45,000 under output for May. Downward trend in June was contrary to the experience last year when production rose fractionally, and is the first month this year to see assemblies below the 400,000-mark.

Half-year total for car and truck output is 2,543,674, with June figures still unofficial. This is nearly double the production in the first half of 1938 which amounted to 1,305,501, and 25 per cent ahead of last year when assemblies reached 2,055,744.

How do the figures break down by makes? Well, General Motors averaged about 43 per cent of the total, or 1,093,782 for six months of this year. Chrysler accounted for some 24 per cent, or 610,483; Ford about 22 per cent or 559,609, and the independents 11 per cent or 279,805. Compared with last year, the breakdown shows a slight increase in General Motors' percentage, a trifle less for Ford, and Chrysler about the same. Independents also have retained their share, if anything have built it up a little.

At this point the question naturally suggests itself: What of the rest of the year? First, it should be realized that production in the second half obviously will be considerably below the first half, because of model changeovers which require roughly two months. While there is some output during this period, it is relatively unimportant. Second, the economic outlook for retail sales of cars is uncertain, principally because of the European situation. A consensus of official opinion right now would indicate that sales this fall should be good because of the pickup in industrial production and employment incident to armament and defense equipment manufacture. Against this must be weighed several factors including sharply higher taxes, some already in effect, and the possibility of price increases in automobiles.

Higher Prices Expected

A Buick dealer in Detroit, representative of the average large-city retail outlet, is definitely talking higher prices for 1941 models. He is suggesting advances of from $90 to $120, basing his opinion not on information from the factory but from off-the-record comments of plant officials and suppliers. Naturally such talk provides an ideal lever to drive in sales at the present time, and it is being used to fullest advantage. On this score perhaps the report should be discounted, but nevertheless it is representative opinion.

The same source declares that stocks of new cars are not particularly excessive in the medium price classes, although they are heavy in the lower price ranges. In fact, he states there are even shortages of some models, particularly two-door sedans.

Examining the price question, it is difficult to deny that advances appear likely. We are in an inflationary period, with business and employment being given artificial stimulation of enormous governmental expenditures which some day must be met by the consumer. While car builders probably will have the advantage of low-cost steel for initial assemblies of 1941 models, there is no doubt that steel prices have firmed and may be in for an advance in the fourth quarter or by the first of the year. Costs of other materials definitely will be higher. Zinc die castings, for example, now are being figured at 9¼ to 9½ cents per pound, compared with 8¾ cents last summer, a 7 per cent advance.

Taxes on corporate earnings will mount seriously and the tendency of nearly all businesses is to pass tax increases on to the customer. In the end (and you can take either meaning you choose), the man in the street bears the cost of practically all government levies, emphasizing again that the only source of wealth and money is in honest sweat, government bookkeeping notwithstanding.

Last week Packard announced increases of $4 to $14 on 1940 models to cover the boost in federal excise taxes which became effective July 1.

So, if car prices are to be advanced, retail sales will hold strong until supplies of 1940 models are exhausted and there may be a serious shortage of customers when the 1941's make their bow. That this is actually happening appears to be

demonstrated by the sales picture in recent weeks. Witness Oldsmobile sales for the second ten days of June 61 per cent over the same period a year ago; Packard sales for the first 20 days of June 60 per cent over a year ago; Pontiac sales for the first 20 days 68.9 per cent over a year ago; Chevrolet sales for the second ten-day period 52.9 per cent over a year ago; Chrysler sales for first half of June 62 per cent over 1939.

Several producers have made last minute extensions to material commitments for 1940 production and are determined to squeeze the last drop of output from tools and dies on current runs. By the fifteenth of this month, however, assembly lines will start to cool off and maintenance crews will descend on them to make changes for new model production.

It looks at this juncture as though Buick will have a 20 series next fall to supplement the present line, one prediction being that the 20 series will be substantially the present 40 series, the latter swinging over to the Torpedo type of body used this year on the 50 and 70 series. New bodies developed for the 50 and 70 style-leader lines are reputed to be still wider, with trunks eliminated in favor of the "toboggan slide" back or "fast" back as the designers call it.

Some sweeping design changes are reported in store for Packard. Emulation of the Torpedo bodies—wide, roomy and low—is said to be a characteristic of the 1941 Packard lines which some have considered overdue for a fairly complete restyling.

■ MANY a sales representative here currently is bemoaning his fate because of inability to accept new business in view of the fact first-line parts plants are loaded nearly to capacity. Attractive offers of new business must be turned down with the routine comment, "very sorry, but will you please contact us in a few months." The situation is made to order for the second-line shops and new businesses which are continually springing up. Now is the time many of these enterprises can grab off a juicy contract from a leading manufacturer.

Such a turn of events often makes for large-scale shifting of accounts. When a buyer is forced to contract with a new source of supply, he occasionally will find the product and service superior to that obtained from his old established source, in which event the original supplier may find considerable difficulty getting the business back when demand eases off.

Also in times like these, the so-called "alley" shops, doing a second-rate job with second-rate labor and equipment, can find good pickings. Fortunately, however, such shops have become fewer and fewer in recent years, and find it much more difficult to start up now than they did back in the lush days of the twenties.

■ AFTER two and a half years of building small diesel engines, General Motors diesel engine division here has announced doubling its productive capacity, now 3000 engines a year in one, two, three, four and six-cylinder models. Floor space for manufacturing is being upped to 379,000 square feet, buildings scheduled for completion October 1. It is doubtful, however, whether new equipment can be delivered and installed ready for operation by that time.

These diesels, ranging from 15 to 165 horsepower in size, are sold to both manufacturers and retail customers, also are converted for marine purposes. The company also supplies all Allis-Chalmers diesel requirements for tractors, and more than a score of other equipment manufacturers, such as shovel and pump builders, use this type of power. Retail sales in the form of "packaged power" for all stationary purposes and for replacement in mobile equipment are made through 100 outlets in this country and Alaska. Expansion was dictated solely by normal growth in adoption of diesel power, it is said.

The automobile industry is a large user of molded plastics for decorative purposes in cars and hence was interested in announcement last week that the Plaskon Co. Inc., Toledo, O., supplier of raw materials for plastic molding and hitherto owned by Toledo Scale Co., had been acquired by Libbey-Owens-Ford Glass Co. While financial details were not revealed it is reported over $2,000,000 was involved in the purchase.

"While Plaskon will be operated independently, the growing relationship of basic plastics to flat glass products makes the purchase of this interest a natural development," said John D. Biggers, L-O-F president. Speculation was heard over the possible effect of the transfer upon a building program being contemplated by the Plaskon management.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1938	1939	1940
Jan.	226,952	356,962	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	*366,800
6 mos.	1,305,501	2,055,744	*2,543,674
July	150,450	218,494	.....
Aug.	96,946	103,343	.....
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.

Estimated by Ward's Reports

Week ended:	1940	1939†
June 8	95,560	65,265
June 15	93,635	78,305
June 22	90,060	81,070
June 29	87,550	70,663
July 6	51,975	42,784

†Comparable week.

Lake Traffic Heavy

Biggest year in history on the great lakes has crammed the Detroit river with traffic such as it has seldom seen. Many old ships particularly of Canadian ownership, out of service for years, have been refitted for lake service, to free newer vessels for ocean trade. Indicative of the tempo, every ship flying the houseflag of the Ford Motor Co. fleet has been in service since navigation started April 16.

The Ford fleet, established in 1924, now comprises 29 vessels, including five ocean-going in coastwise and South American trade, four 300-foot canalboats operating from the Rouge plant harbor here down the New York state barge canal and on to the Hudson river and Ford assembly plants at Edgewater, N. J., Chester, Pa., and Norfolk, Va.

These canalboats are of special design to permit engines, rear axle assemblies and other parts to be shipped without crating, being lowered in racks into the holds. The boats ride low in the water, have masts and deckhouses which can be lowered to permit passage under some of the 16-foot bridges along the barge canal.

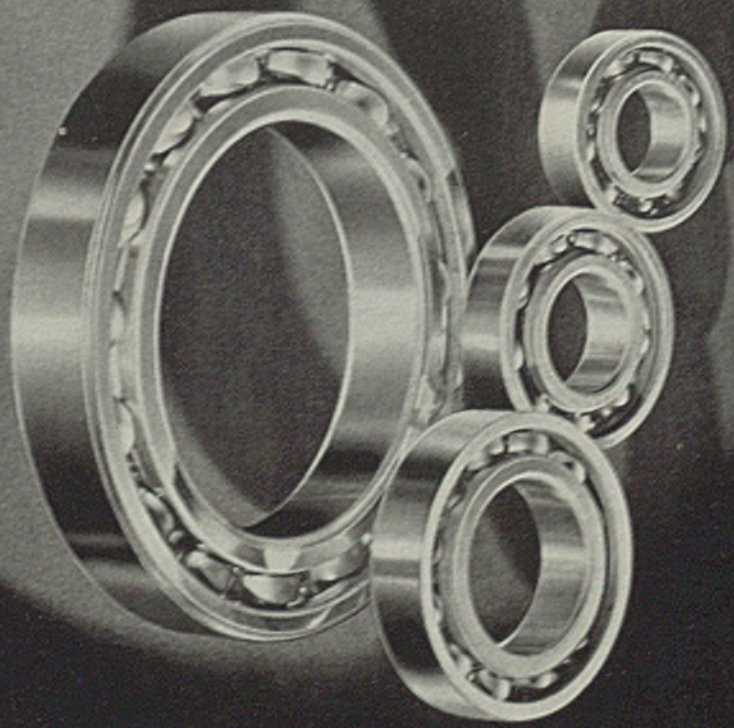
Feminine influence is acknowledged as a dominant factor in the selection of an automobile, but Buick sales department statisticians say analysis shows men sign 82.8 per cent of all new orders, against 14 per cent by women and 3.2 by business concerns. Classification of orders for 1940 models by occupational groups shows merchants and tradesmen 16.3 per cent, salesmen 11.4 per cent, business executives 11.2 per cent, and other groups smaller percentages.

■ Pension payments to retired employes of the General Electric Co., Schenectady, N. Y., totaled $2,567,042 during 1939.

EXPERIENCE . . .

Foundation of Outstanding Quality

● In manufacturing highly specialized precision products, such as New Departure ball bearings, there is no short cut to the knowledge and skill gained by long experience. The superiority of the methods, materials and the products resulting from New Departure's fifty years of manufacturing experience is recognized wherever bearings are used. New Departure, Division of General Motors, Bristol, Connecticut.



NEW DEPARTURE

THE FORGED STEEL BEARING

MEN of INDUSTRY

■ GEORGE M. HUNTER, vice president in charge of manufacturing operations, American Bridge Co., Pittsburgh, retired July 1 with a service record of 51 years with the United States Steel Corp. subsidiary. Frank K. McDanel, associated with the Bridge company since 1904, succeeds

George M. Hunter

Mr. Hunter. Mr. McDanel has served continuously at the Ambridge plant 36 years. Since his first assignment as a helper, he has occupied various plant supervisory positions. He was appointed plant superintendent in 1923 and continued in that capacity until his recent advancement. He has also been elected a director.

♦

John W. Alden has joined the Steel and Tube division of Timken Roller Bearing Co., Canton, O., as mill metallurgist. He formerly was employed as a metallurgist by the United Steel Co., Central Alloy Steel Corp., and Republic Steel Corp.

♦

B. S. Woodman, formerly associated with the Wagner Electric Corp. as special representative and branch manager of the Philadelphia territory, has been appointed special representative, Roller-Smith Co., with headquarters in Bethlehem, Pa.

♦

J. L. Morrissey, formerly sales manager, screw products division, National Acme Co., Cleveland, has joined Ferry Cap & Set Screw Co., Cleveland, as vice president in charge of industrial sales. He will devote his efforts to the sale of special parts.

♦

George H. Freers has joined the engineering staff of Marmon-Herrington Co., Indianapolis. He formerly was associated with the engineering departments of Interstate Automobile Co., United States Motors, Packard Motor Car Co., Alden Sampson Truck Co., Marmon Motor Car Co. and Stutz Motor Car Co. At one time he was chairman, Indiana section, Society of Automotive Engineers.

♦

S. M. Washabaugh has been appointed sales representative for National Screw & Mfg. Co., Cleveland. His territory will be in Pennsylvania and the northern part of Maryland, with headquarters in Williamsport, Pa., where he formerly was associated with Sweet's Steel Co.

♦

Arthur Waldman has been appointed to the newly created position of assistant general superintendent, coal mines division, Tennessee Coal, Iron & Railroad Co.,

Frank K. McDanel

Birmingham, Ala. He formerly was chief engineer, coal mines division, and will be succeeded in that position by Hugo C. Nyquist, heretofore superintendent, Docena coal mine. Woods G. Talman, industrial engineer, coal mines division, succeeds Mr. Nyquist at Docena, and George W. McCaa succeeds Mr. Talman as industrial engineer.

♦

Charles R. Underhill, since 1937 president, Brown Fence & Wire Co., Cleveland, has resigned. M. B. Sackheim, vice president, has been named general manager. Position of president, it is understood, will remain unfilled until the company's annual meeting next month.

♦

J. E. Stanton, the past 28 years associated with Republic Steel Corp., Cleveland, and predecessor companies in various executive capacities, has been appointed assistant to the president, Aviation Mfg. Corp., with headquarters at the Lycoming division, Williamsport, Pa. In addition to his duties as assistant to the president, he will co-ordinate activities of industrial engineering and accounting with operations of the corporation's four divisions.

♦

W. C. Morgenstern is now assistant chief engineer at Copperweld Steel Co.'s new steel plant at Warren, O. A graduate of Cornell university in 1909, Mr. Morgenstern was previously with American Steel & Wire Co., Carbon Steel Co., Blaw-Knox Corp., Barium Stainless Steel Corp., and as special consulting engineer with Thomas Hilliard.

♦

W. Alec Rawls, Alec Rawls Wrecking Co. Inc., Rocky Mount, N. C., has been elected chairman, South Carolina division of the southern chapter, Institute of Scrap Iron and Steel Inc. Sol Levin, Burlington, N. C., has been elected vice chairman, while Leo J. Kelleher, Southern Converting Co., has been named director.

♦

Harold P. Ingram, since Aug. 1, 1938, superintendent of maintenance, Homestead, Pa., works of Carnegie-Illinois Steel Corp., has been named general superintendent, Canton, O.,

Harold P. Ingram

Roll & Machine Works, succeeding William A. Harris, who is retiring after 34 years of continuous service with subsidiary companies of the United States Steel Corp.

Mr. Ingram began his career in the engineering department of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in May, 1913. He

joined the roll department, Homestead works of Carnegie-Illinois, as an apprentice in November, 1915, and from 1920 to 1928 was employed as a draftsman. He then became superintendent, Homestead roll department, and superintendent of maintenance.

♦

G. B. Flanigan, associated with Chain Belt Co., Milwaukee, 15 years, has been appointed New York district manager, to succeed the late W. H. Quinn. Joining the company in 1925, Mr. Flanigan for several years was located at Milwaukee, in both manufacturing and sales departments; in 1928 became a member of the New York sales staff, and in 1937 was named Chicago district sales manager.

R. T. Steindorf has been made district manager at Chicago. Following graduation from Purdue university in 1924, he joined Chain Belt as an apprentice, and since that time has worked in both the engineering and sales departments.

♦

Delbert E. Jack has been appointed general sales manager, Duriron Co. Inc., Dayton, O. He succeeds W. H. Scott, retired. Since graduation from the University of Colorado in 1923, Mr. Jack has been identified with the design and application of chemical plant equipment, and formerly handled Duriron Co. sales in the San Francisco area.

♦

W. J. Frederick, president, Frederick Steel Co., has been elected chairman, Cincinnati chapter, American Society of Tool Engineers. Other officers are: Thomas T. Kling, assistant to superintendent, Lodge & Shipley Machine Tool Co., vice chairman; Charles M. Carr, chief tool designer, R. K. Le Blond Machine Tool Co., treasurer; and W. D. Averill, sales engineer, Cincinnati Milling Machine & Cincinnati Grinders Inc., secretary.

♦

Georges F. Doriot has been elected president, McKeesport Tin Plate Corp., McKeesport, Pa., and will continue as chairman of the executive committee and a director. J. P. Fife has resigned as acting president of McKeesport, coincident with the election of Mr. Doriot, and will continue as chairman of the board.

William H. McLean, a director, has been appointed assistant to Mr. Doriot. Charles H. Hatch has been elected vice president in charge of finance and treasurer. He formerly was assistant to the president of National Can Corp., a wholly owned subsidiary.

♦

F. D. Latshaw, the past 15 years assistant superintendent, has been

G. B. Flanigan

made plant superintendent, Gary Screw & Bolt Works, Gary, Ind. He succeeds William E. Irvin, superintendent since 1916, who has retired because of ill health. R. P. McDonald has been named to the newly created post of plant manager, and will continue as secretary. Raymond Knight has been placed in charge of the Gary screw machine shop and tool room, succeeding the late A. J. Windle, Arthur B. Carroll, heretofore a departmental superintendent, has been appointed assistant superintendent in charge of production equipment to succeed Mr. Latshaw.

♦

Harvey S. Johnson has been appointed vice president and general manager, Metal Specialty Co., Cincinnati. After several years' experience in various departments of the metal stamping plant of Bossert Corp., he spent four years as district sales manager in the Cleveland and Detroit areas. He then became assistant and later general sales manager. The past several years he has been on special assignment work with one of the larger firms of management engineers.

"Humanizer of Business" Award to Mr. Verity

■ *Forbes Magazine* presented its "Humanizer of Business" award for 1939, given each year to the employer who has played "the most outstanding role in humanizing business and in creating better employe relations and understanding," to George M. Verity, 75, chairman, American Rolling Mill Co. The award in the form of a gold medal and scroll was given to Mr. Verity by B. C. Forbes at an outdoor Fourth of July celebration at the company's headquarters in Middletown, O. A large group of employers and townspeople witnessed the ceremony.

"Not one hour of work has ever been lost during the company's 40 years' existence through labor strife," *Forbes* records. So fully have employes been taken into consultation and confidence all through the years that, when outside influences from time to time sought to intrude, the men overwhelming turned thumbs-down."

Fifty-Five Years in Machine Tool Industry

■ August H. Tuechter, president, Cincinnati Bickford Tool Co., Cincinnati, will complete 55 years of association with the machine tool industry July 13.

He was born in Cincinnati in 1869, and July 13, 1885 went to work as office boy for Henry Bickford, who made upright drilling machines, and whose shop on the river front in Cincinnati employed ten men. He studied at night, and when the business was sold to the Bickford Drill Co. in 1887, he was promoted from bookkeeper to general manager.

In 1889 this company expanded

August H. Tuechter

to become the Bickford Drill & Tool Co., and Mr. Tuechter was made a partner. He left the company in 1899 and with Sherman C. Schauer organized the Cincinnati Machine Tool Co., of which he was business manager. In 1909 this company absorbed the Bickford Drill & Tool Co., and reorganized as the Cincinnati Bickford Tool Co. Mr. Tuechter was made president and has served ever since in that capacity.

He is a member of many engineering and business organizations and is widely known for philanthropic and public welfare activities. He was one of the founders of the National Metal Trades association and served as president of the Cincinnati branch in 1916-17. He also was president of the National Machine Tool Builders association, 1920-1923.

Who Will Do the Tooling?

■ SINCE the collapse of France, both public and official attention has been focused sharply upon the American machine tool industry to determine whether it is a powerful asset to—or a bottleneck in—our suddenly conceived national defense program. STEEL is of the opinion that with certain adjustments now being made, the machine tool industry will be able to cope with the situation as far as standardized machine tools and their regular equipment are concerned.

In the meantime, however, too little attention is being paid to the momentous question, "How and by whom are untold thousands of machine tools to be tooled up to meet the demands of the huge national defense program?"

Responsibility for the design and fabrication of special tools, dies, jigs, fixtures, etc., properly should not rest on the overburdened shoulders of the machine tool builders, despite the fact that in slack times —and even in normal times—many of them have carried heavy loads of that kind of work in an effort to win new customers and to hold old ones.

Machine Tool Plants Are Now Too Busy To Handle Rush of Special Tooling

Machinery builders have, as a matter of fact, done so much special tool making that it generally is assumed that they will go right on expanding this service to meet expanding demands. That assumption is wrong. American machine tool builders from now on are going to have all that they can do in their own distinct field of machine tool building.

How and by whom, then, are untold thousands of machine tools to be tooled up for the national defense program? With special tool shops already rushed to the limit of their manpower and equipment, that responsibility now seems to rest squarely upon the tooling departments of production metalworking plants throughout the country. Are there enough men in these departments today to handle the impending avalanche of special tooling? The answer to that definitely is, "No." Is there time to train the necessary additional men "from the bottom up"? The answer to that likewise is "No."

Experienced Draftsmen and Machinists Must Be Transferred to Tool Work

Fortunately, however, there is a way out. It lies in prompt, carefully planned transfers to tool engineering and tool making of selected draftsmen and machinists whose training and skill are such that they can immediately become useful on vital tool work. Their present more routine duties in other departments must be turned over to somewhat less experienced and less versatile men promoted from down the line. That in turn means that new men of limited skill and little or no experience must be drawn in at the bottom of the organization—which after all is exactly where they should start.

Keen executives who recognize familiar signs such as "Skilled Help Wanted" advertisements in the newspapers should take no chances with their own valuable assets in personnel. They should lay plans right now and earmark employes for transfers and promotions which will insure that the impending rush of special tooling problems will be dealt with promptly and effectively within their own organizations. They should get ready for the hurricane before it strikes.

The BUSINESS TREND

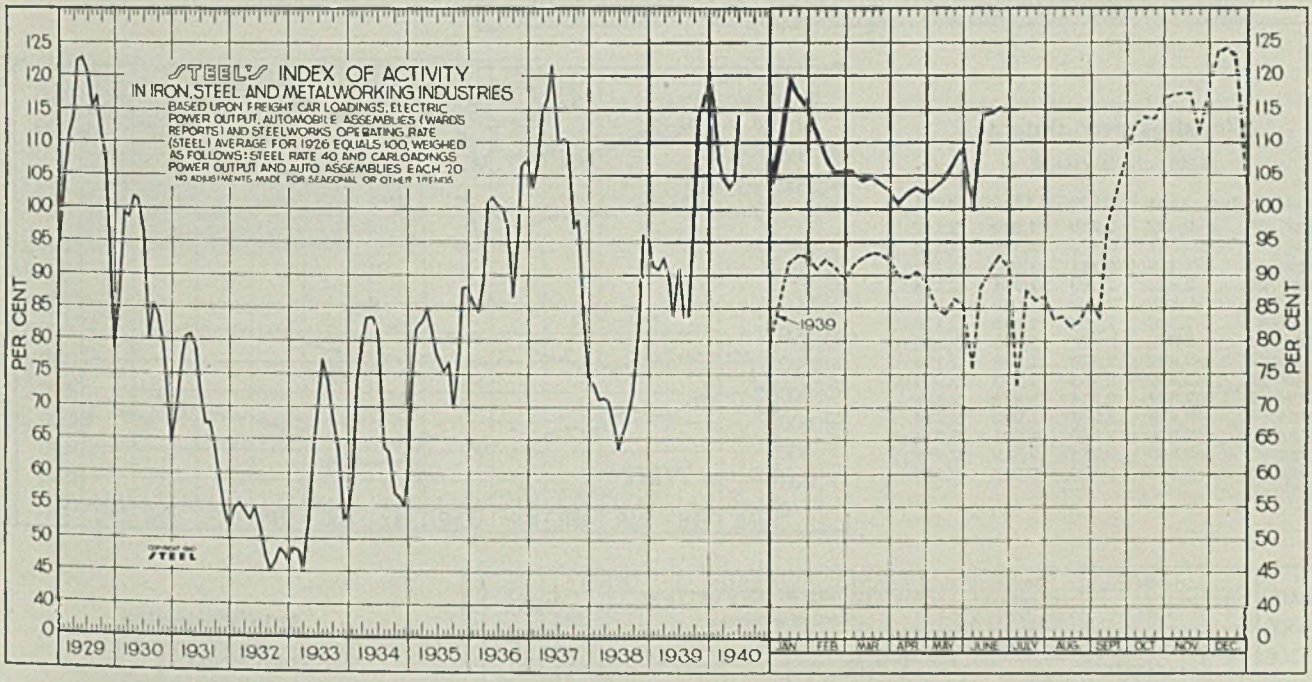
Activity Index Moves To Higher Level

■ The monthly average of STEEL's index of activity rose 1.9 points in May and 9.5 in June, reflecting the sharp upward trend of operations in the iron, steel and metalworking industries throughout this period.

The moderate recession of business activity which got underway in January apparently reached the turning point in April when the monthly index reached the 102.7 level compared with 118.9 average recorded in December, the peak month last year. In May of this year the index rose to 104.6 and for June climbed to 114.1.

Despite the seasonal decline in automobile production during the week of June 29, STEEL's weekly index moved to still higher levels reflecting the continued gains in steelmaking operations, revenue freight carloadings and electric power output. In that week the index stood at 115.1 level, a gain of 0.3 points over the previous week's index figure of 114.8 and remained well above the 91 recorded in the comparable week last year.

During the period ended June 29, steelmaking operations and freight carloadings reached new high levels for this year. Electric power output reversed the slight decline recorded in the previous week.



STEEL'S index of activity advanced 0.3 points to 115.1 in the week ended June 29:

Week Ended	1940	1939
Apr. 27	102.8	89.2
May 4	103.3	85.1
May 11	104.8	84.2
May 18	106.8	86.6
May 25	109.1	85.4
June 1	99.2	75.9
June 8	111.9	88.2
June 15	114.6	90.9
June 22	114.8	93.0
June 29	115.1†	91.0

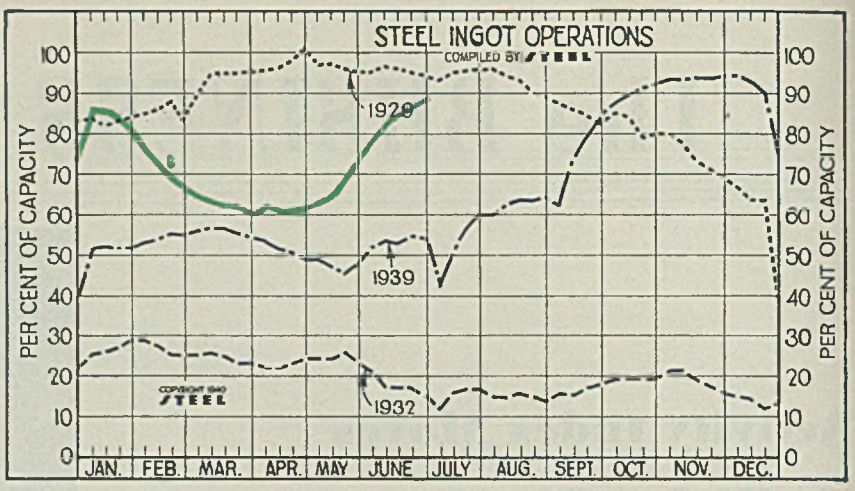
†Preliminary.

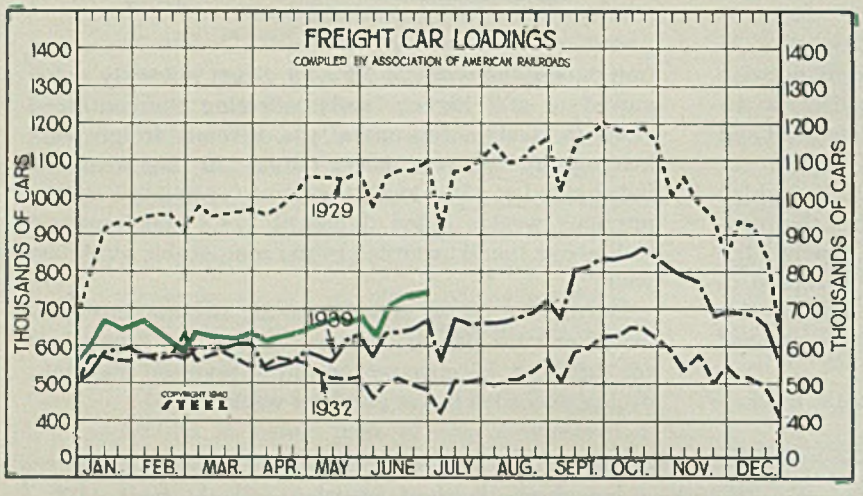
Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
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
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
July	.....	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	.....	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	....	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
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
Mar. 30....	61.0	54.5	36.0	91.5
Apr. 6....	61.5	53.5	32.0	91.5
Apr. 13....	61.0	51.5	32.0	91.5
Apr. 20....	61.5	50.5	32.5	91.5
Apr. 27....	61.5	49.0	32.0	91.0
May 4....	63.5	49.0	31.0	91.0
May 11....	66.5	47.0	30.0	89.0
May 18....	70.0	45.5	30.0	91.5
May 25....	75.0	48.0	28.5	75.0
June 1....	78.5	52.0	25.5	75.0
June 8....	81.5	53.5	25.5	74.0
June 15....	86.0	52.5	27.0	75.5
June 22....	88.0	54.5	28.0	74.0
June 29....	89.0	54.0	28.0	77.5





Freight Car Loadings

(1000 Cars)

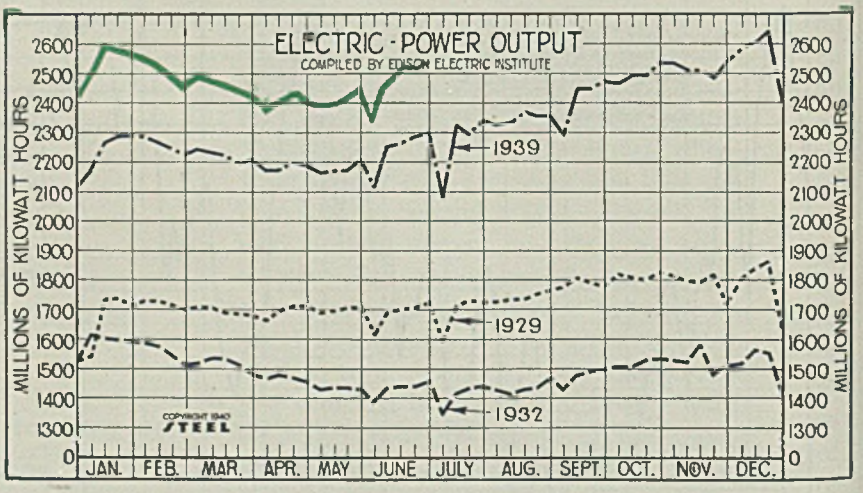
Week ended	1940	1939	1938	1937
Apr. 6.....	603	535	522	716
Apr. 13.....	619	548	538	751
Apr. 20.....	628	559	524	761
Apr. 27.....	645	586	543	782
May 4.....	666	573	536	767
May 11.....	681	555	542	774
May 18.....	679	616	546	779
May 25.....	687	628	562	795
June 1.....	639	568	503	692
June 8.....	703	635	554	754
June 15.....	712	638	556	756
June 22.....	728	643	559	774
June 29.....	745†	666	589	806

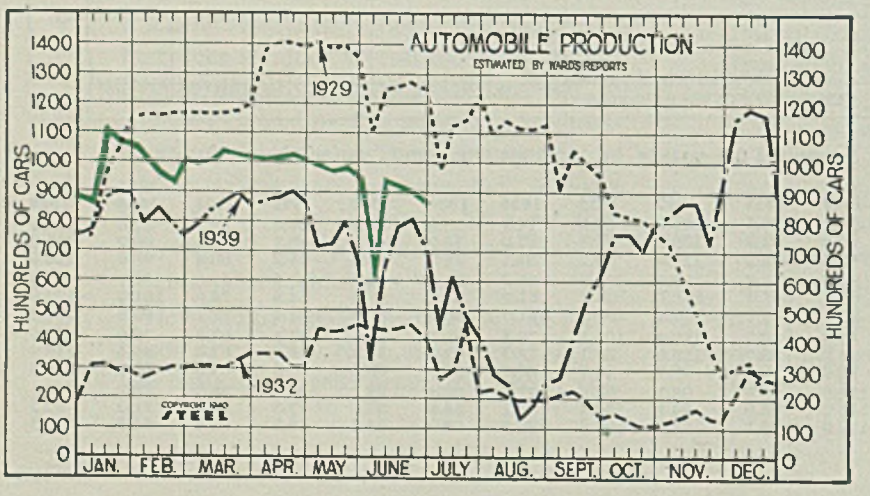
†Preliminary.

Electric Power Output

(Million KWH)

Week ended	1940	1939	1938	1937
Mar. 30...	2,422	2,210	1,979	2,147
Apr. 6 ...	2,381	2,173	1,990	2,176
Apr. 13...	2,418	2,171	1,958	2,173
Apr. 20...	2,422	2,199	1,951	2,188
Apr. 27...	2,398	2,183	1,939	2,194
May 4....	2,386	2,164	1,939	2,176
May 11...	2,388	2,171	1,968	2,195
May 18...	2,422	2,170	1,968	2,199
May 25...	2,449	2,205	1,973	2,207
June 1...	2,332	2,114	1,879	2,131
June 8...	2,453	2,257	1,992	2,214
June 15...	2,516	2,265	1,991	2,214
June 22...	2,509	2,285	2,019	2,238
June 29...	2,514	2,300	2,015	2,238

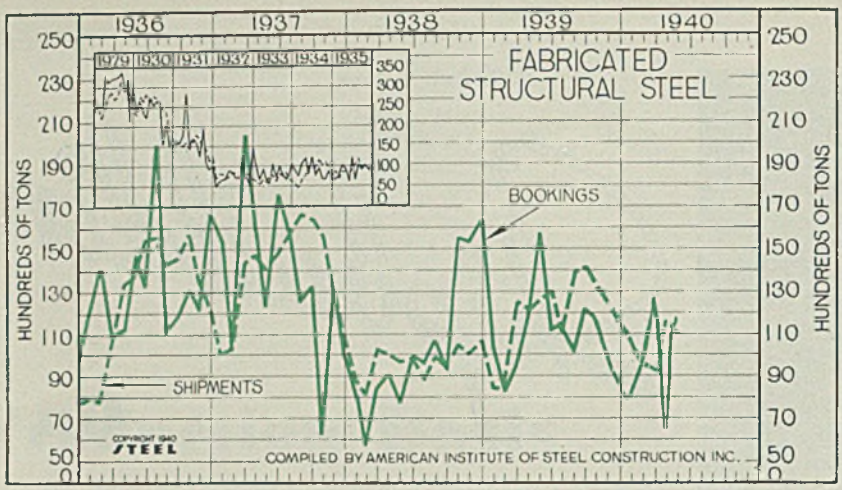




Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
Mar. 30....	103.4	86.0	57.5	97.0
Apr. 6....	101.7	87.0	70.0	99.2
Apr. 13....	101.9	88.0	62.0	125.5
Apr. 20....	103.7	90.3	60.6	133.2
Apr. 27....	101.4	86.6	50.7	139.5
May 4....	99.3	71.4	53.4	140.2
May 11....	98.4	72.4	47.4	140.4
May 18....	99.0	80.1	46.8	131.3
May 25....	96.8	67.7	45.1	131.4
June 1....	61.3	32.4	27.0	101.7
June 8....	95.6	65.3	40.2	118.8
June 15....	93.6	78.3	41.8	111.6
June 22....	90.1	81.1	40.9	121.0
June 29....	87.6	70.7	40.9	122.9



Fabricated Structural Steel

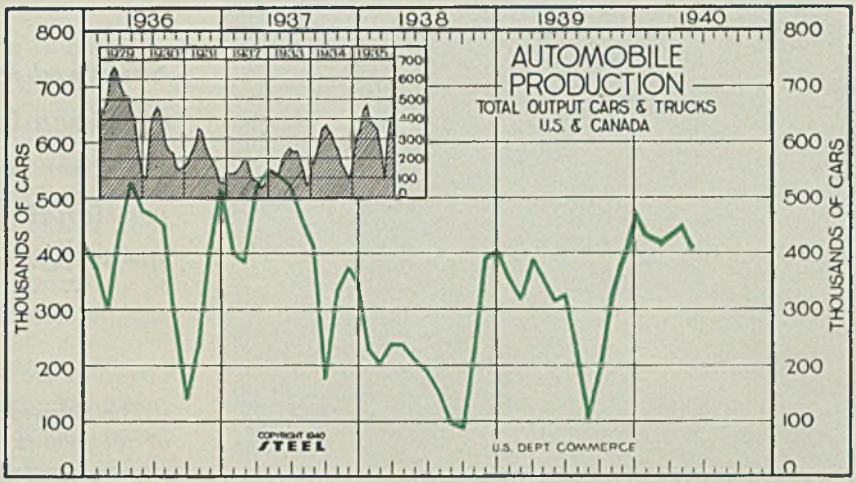
(1000 tons)

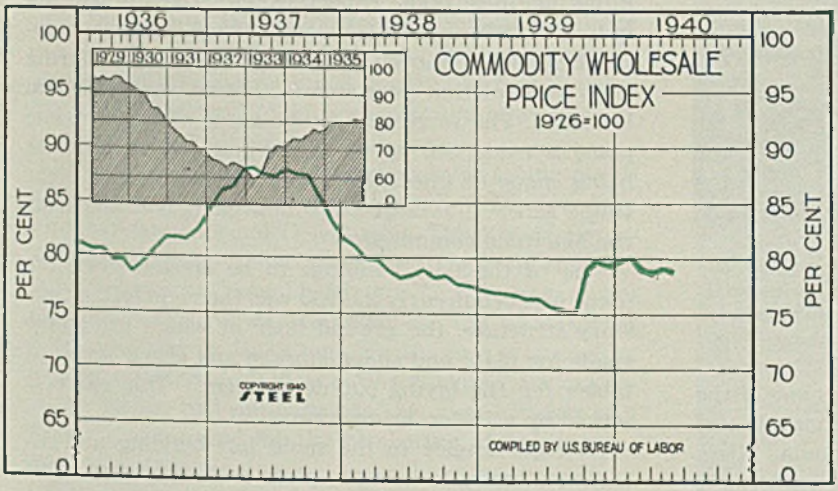
	Shipments			Bookings		
	1940	1939	1938	1940	1939	1938
Jan.	110.9	84.3	87.8	81.7	101.7	80.3
Feb.	97.2	84.4	81.2	98.9	82.7	57.1
Mar.	95.9	125.3	103.3	128.3	95.1	84.3
Apr.	115.9	120.9	100.0	67.1	118.3	91.2
May	109.2	125.9	96.4	117.8	156.9	77.3
June	.....	130.1	98.6	....	111.6	99.9
July	.....	110.5	88.0	....	114.1	96.0
Aug.	.....	139.7	98.6	....	100.9	106.8
Sept.	.....	140.8	93.5	....	121.4	92.5
Oct.	.....	133.8	105.0	....	118.8	154.8
Nov.	.....	128.2	99.9	....	99.3	153.1
Dec.	.....	116.2	106.5	....	84.4	163.4
Total	....	1440.1	1158.8	....	1305.0	1256.6

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	.....	324.2	189.4	521.1	469.4
July	.....	218.5	150.4	456.9	451.2
Aug.	.....	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





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

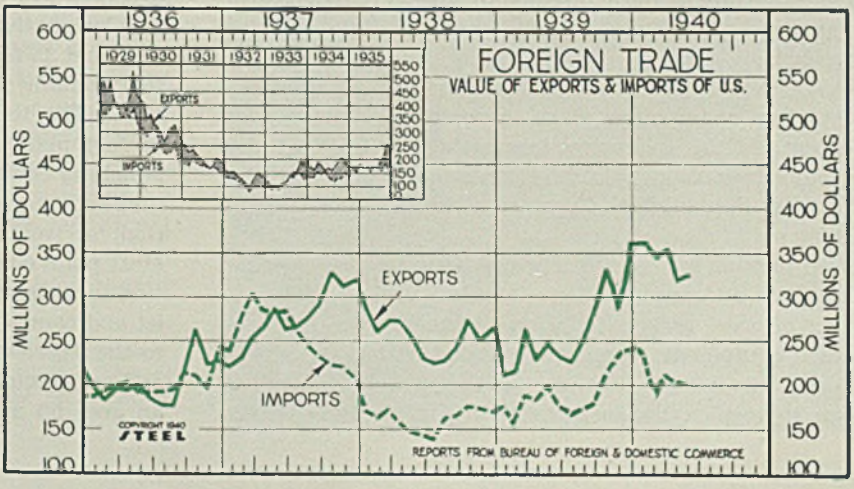
(1926 = 100)

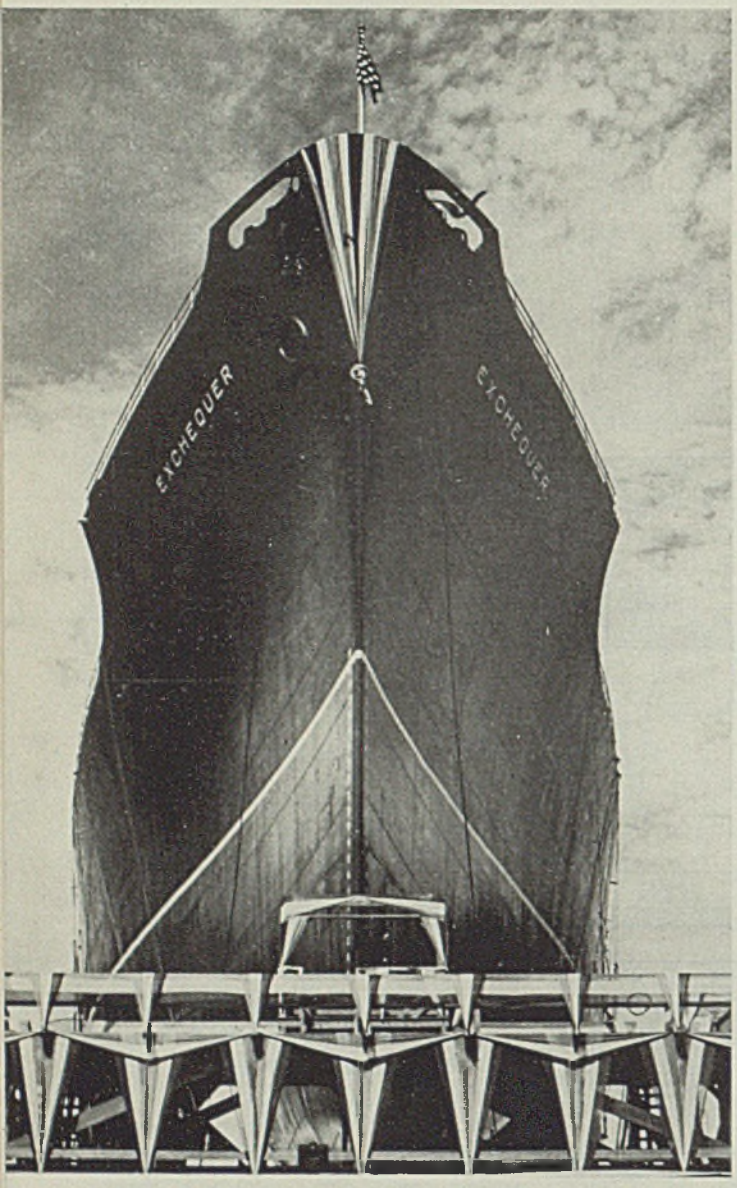
	1940	1939	1938	1937	1936
Jan.	79.4	76.9	80.9	85.9	80.6
Feb.	78.7	76.9	79.8	86.3	80.6
March	78.4	76.7	79.7	87.8	79.6
April	78.6	76.2	78.7	88.0	79.7
May	78.4	76.2	78.1	87.4	78.6
June	....	75.6	78.3	87.2	79.2
July	....	75.4	78.8	87.9	80.5
Aug.	....	75.0	78.1	87.5	81.6
Sept.	....	79.1	78.3	87.4	81.6
Oct.	....	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

United States Foreign Trade

(Unit: $1,000,000)

	Exports		Imports	
	1940	1939	1940	1939
Jan.	$368.6	$212.9	$241.9	$178.2
Feb.	347.0	218.6	199.8	158.0
Mar.	352.3	267.8	216.7	190.5
April	324.0	231.0	212.2	186.3
May	325.3	249.5	211.4	202.5
June	.....	236.1	.....	178.9
July	.....	229.6	.....	168.9
Aug.	.....	250.8	.....	175.8
Sept.	.....	288.6	.....	181.5
Oct.	.....	332.1	.....	215.3
Nov.	.....	292.7	.....	235.4
Dec.	.....	367.8	.....	247.0
Total	.....	$3,177.0	.....	$2,318.3





The EXCHEQUER, first of eight all-welded C-3 vessels being built at Pascagoula, is launched June 8. Its length is 492 feet, breadth 69 feet, draft 28 feet, displacement 17,600 tons. This is bow view at launching

Shipbuilding On a

Shipyard for all-welded vessels is simply big assembly plant putting 500-foot ships together with amazing speed. Unconventional methods cut shipyard investment two thirds. First C-3 cargo vessel launched June 8

■ ABOUT 112 miles east of New Orleans is one of the most unusual shipbuilding plants in existence, that of the Ingalls Shipbuilding Corp. at Pascagoula, Miss., occupying some 46 acres with 3000 feet of waterfront. Here the time-honored method of assembly by riveting has been abandoned entirely and all joints are arc welded.

The shipyard has been designed primarily and essentially as an erection plant, depending to the fullest extent on the extensive fabricating facilities of the Ingalls Iron Works Co. at Birmingham, of which the Ingalls Shipbuilding Corp. is a wholly owned subsidiary.

In making all-welded ships at Pascagoula, existing facilities and organizations familiar with the fabrication of steel and installation of marine piping, electrical equipment, ventilation, joiner work, etc., have been used as far as possible. Another primary objective was to keep capital investment to a minimum.

The shipyard is intended for the exclusive building of all-welded ships. This necessitated in many instances special types of tools, equipment, platen handling facilities, crane capacities, etc. The site was acquired in 1938 and the company's barge building equipment at Mobile moved to it in January, 1939. During early part of that year, some 20 hulls were built and launched. The success of the planning of the complete plant is evidenced by the rapid and orderly progress being made on the fabrication and erection of eight single screw C-3 cargo ships now being completed for the Maritime commission.

One of the first buildings to be erected when the plant was begun early in 1939 was the mold loft, a two-story structure, the ground floor of which has ample space for plate and shape storage and also a series of tables for the laying out department. This space is served by a 15-ton bridge crane.

At right angles to the mold loft building and attached directly to it is the plate and angle shop. This is served by overhead cranes and a standard-gage gasoline locomotive. It houses an assembly platen 150 feet long and 35 feet wide and contains the heavy machine-tool equipment located for proper sequence of operation. The tools consist of a trim shear, gate shear, 30-foot plate rolls and an angle shear. There is no punching equipment whatever. Tables for oxyacetylene shape cutting are quite extensive as plate edge preparation for welding is an important factor in this work. Most plate edges are beveled.

A furnace and forge shop, 100 x 100 feet, built parallel and connecting with the mold loft at a right angle to the fabricating shop provides for a most compact and satisfactory arrangement of furnace blocks with an area 50 x 50 feet. Furnace equipment consists of

By A. J. GRASSICK
General Manager
Ingalls Shipbuilding Corp.
Pascagoula, Miss.

Production Basis

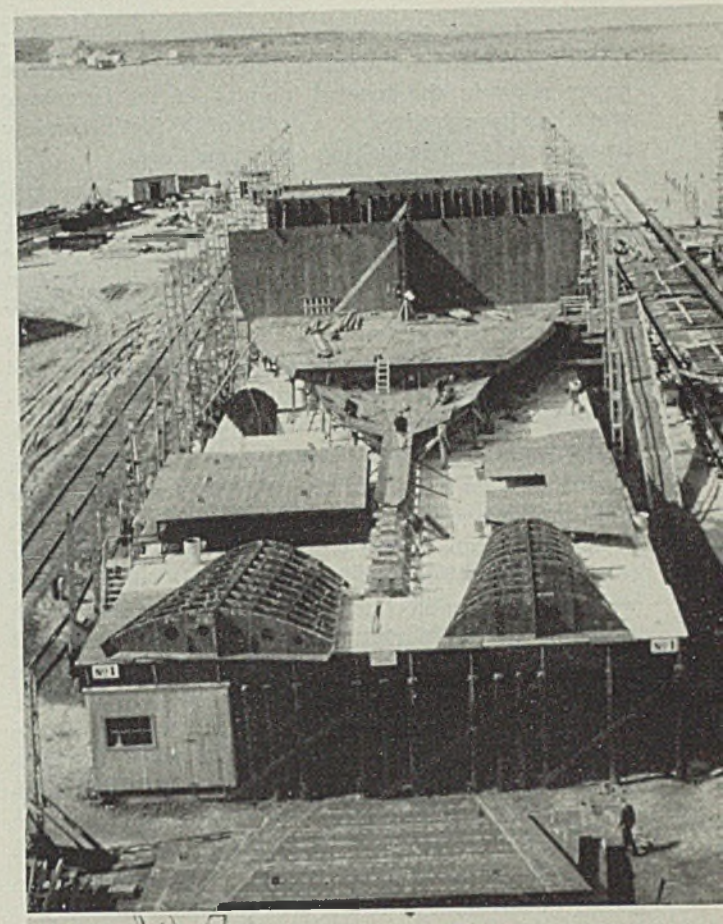
50-foot oil-fired angle furnace and a 35 x 10-foot plate furnace. Located at one side of the furnace blocks is a 500-ton hydraulically operated keel bender, capable of handling plates up to 25 feet in length. The furnace area is served by an electrically operated bridge crane, also is equipped with air and electrically operated winches and hydraulically operated bulldozers to facilitate the working of heavy materials at this location. All machines throughout these shops are served by jib cranes equipped with electric hoists capable of handling loads up to and including 5 tons.

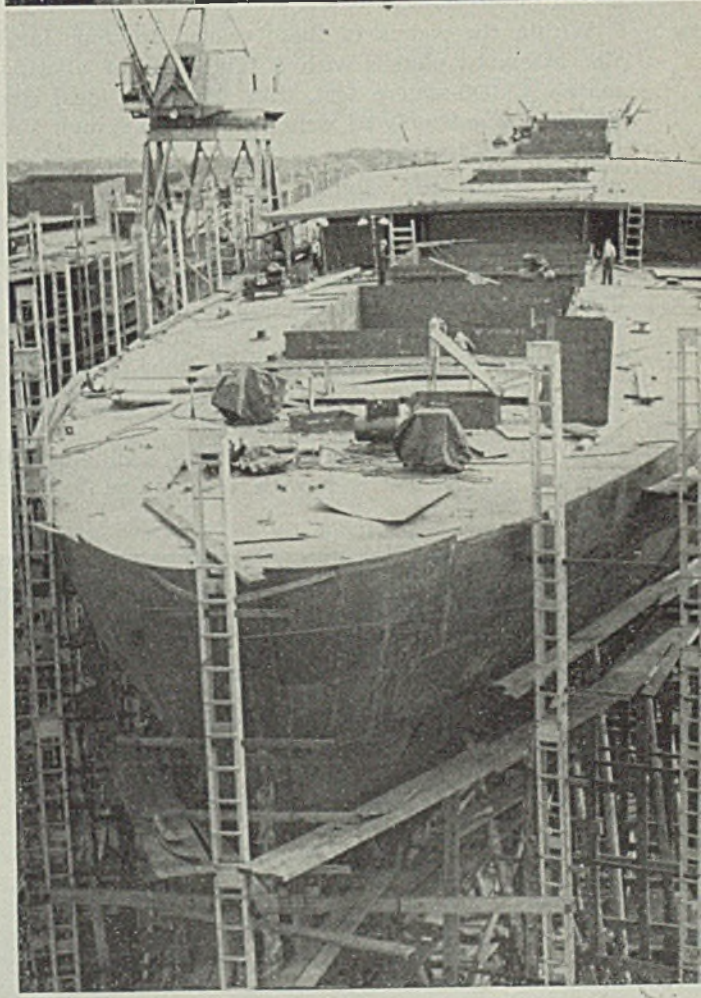
A nearby building houses a 100-kilowatt converter and an electrically driven 500-cubic feet per minute compressor, delivering air at 100 pounds per square inch. The head of No. 3 ways houses two air compressors rated 850 foot cubic feet per minute to give a total capacity of 2200 cubic feet per minute available for the plant. Power at 2300 volts is transmitted to principal substations where it is reduced to 440 volts. Capacitors are used to give an average power factor of 95 per cent, insuring good economy.

At the end of the fabricating shop and running parallel to the mold loft is a finished material crane runway some 625 feet long and 77 feet wide. This provides storage for fabricated material received from the shops in Birmingham. An assembly platen, 72 x 72 feet, at the top end of this runway provides for the assembly of units weighing up to 18 tons. Entire area is served by two bridge cranes of 15 and 10-ton capacities respectively. Heavy tool equipment in this area consists of a shape squeezer used for the cambering of beams, etc., and a plate joggler.

The original design of the shipyard contemplated five building ways. Ways Nos. 1 and 2 were completed July 1, 1939, and are of reinforced concrete construction built in a series of horizontal steps to a declivity of ⅝-inch per foot. Building No. 3 of the same design was completed August 1, 1939; No. 4, August 15, 1939. No. 5 has been projected and designed for future requirements. There is ample space along the remaining broad waterfront of some 2000 feet for additional ways.

Outboard launching ways were carried overboard





Upper, a C-3 cargo vessel begins to take shape. Note subassemblies on near end of building ways. Lower, erection proceeds at fast pace. Part of second deck plating already is in place here

to a depth of 8 feet at mean low water by construction of a steel coffer dam of interlocking piling. The entire river in the general vicinity of the launching ways has been dredged to a depth of 30 feet mean low water, ample for launching operations.

Building ways are served by three gantry cranes, each with a lifting capacity of 35 tons at a radius of 57 feet and towering nearly 200 feet in the air. See accompanying illustrations. When operated in tandem with an equalizing bar provided for the purpose, they are capable of handling weights up to and including 75 tons, such lifts being essential to the speedy and economical building of welded ships where comparatively large subassemblies must be lifted into place.

The three cranes are identical, are of the revolving type carried on a structural tower 65½ feet from track rail to roller path. Each tower is carried on four trucks of special design, two of which are power trucks, gear connected to 15-horsepower propelling motors and with automatic electrically operated brakes. Each tower is of the portal type, permitting passage of standard railroad equipment and locomotive cranes on railroad tracks on the center line of the gantry tracks. At the base, the gantry track is 20 feet from center to center of rails. The truck base is 30 feet. The crane boom is 110 feet long with load line at 85 feet and the whip line at 110 feet. The 7-part load line capacity for the crane at 57-foot radius is 35 tons and 13 tons at 95-foot radius while the 2-part whip line has a capacity of 6 tons at 35 to 100-foot radius.

Within the radius of these cranes are four large flat assembly platens with a total area of approximately 23,000 square feet, thus providing ideal conditions for assembly of weldments of maximum size.

Standard-gage railroad tracks passing beneath the gantry cranes and running the full length of each building slip make it possible to spot car shipments of fabricated steel, machinery and other material at any point desired. This permits material to be unloaded directly from car to ship, thereby saving expensive rehandling. This arrangement also allows the use of locomotive cranes, of which there are four for erecting and handling much of the material, thus definitely augmenting gantry crane service.

Ample warehouse space is provided in a building 370 feet long and 45 feet wide with a mezzanine floor for storage of light material and a monorail for rapid handling of parts.

The building for the ship carpenter shop is 180 feet long and 50 feet wide and is equipped with surface planers, electric saws, heavy type band saw, jointer, grinders, drills, etc.

Machine shop, sheet metal shop and pipe shop occupy a building 212 feet long and 50 feet wide near the building ways and fitting-out docks. The paint department is in a nearby building, 70 x 30 feet.

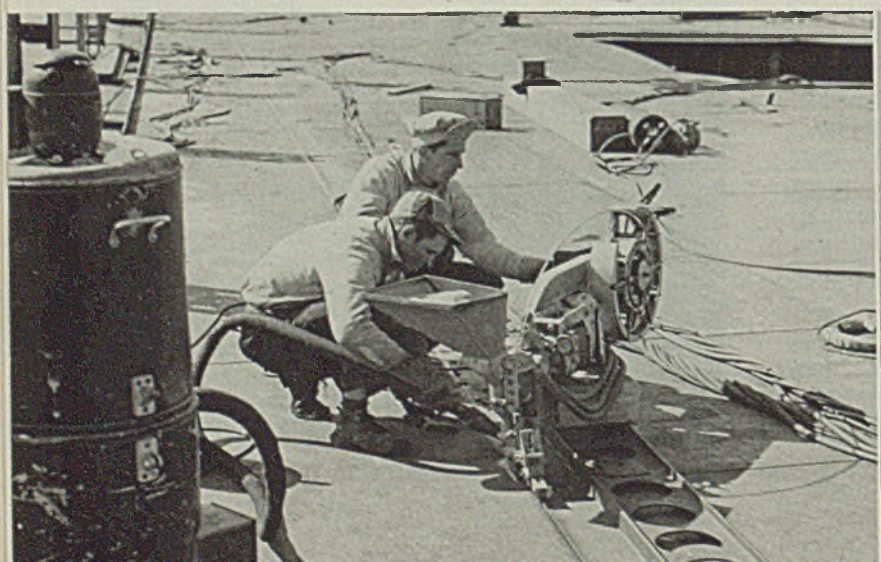
The importance of proper facilities for rapid handling of materials at the fitting-out dock was recognized and is taken care of by a 50-ton stiff-legged derrick electrically operated and erected on a platform 65 feet above mean low water. The working radius will allow material to be placed on board in locations forward and aft of the midship deckhouse structure. Heavy lifts having been completed, vessels may be moved along the dock where they will be served by two 10-ton electrically operated derricks.

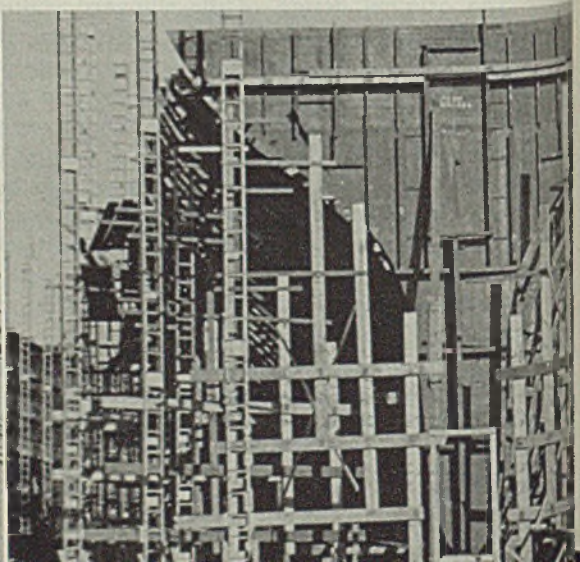
Fabricating Procedure

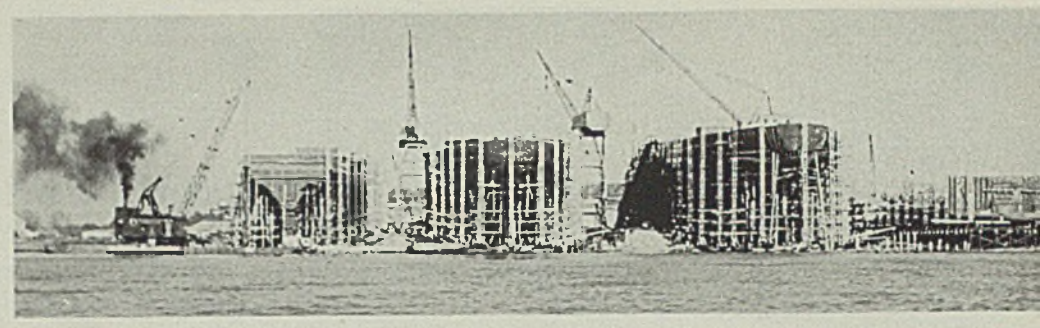
The design of the fabricating shop and its heavy machine tool equipment having been predicated on using the existing facilities of the Birmingham shops to the fullest extent, approximately 80 per cent of all mold-loft templets are shipped to Birmingham. Major portion of the work required to be furnaced, both plate and shape, and all plating requiring flanging, knuckling and rolling is done at Pascagoula where equipment has been installed for those purposes.

Successful, economical and rapid building of welded vessels requires that the entire structure be divided into subassemblies or weldments as large as existing crane facilities can handle. Practically all structural material with the possible exception of certain curved shell plating and framing finds its way into weldments passing over the assembly platens. The speed with which a welded ship can be erected depends largely upon the capacity of the platens. The six large plate-assembly platens here have a total area of approximately 34,000 square feet, ample space for these important operations.

In assembly of structural work on these platens, the use of liner-offs has been renewed. The lining-off on welded ships is made necessary because the mold loft







Stern view of four C-3 vessels under construction as seen from the river. Note towering gantry cranes, big enough to handle subassemblies weighing up to 75 tons

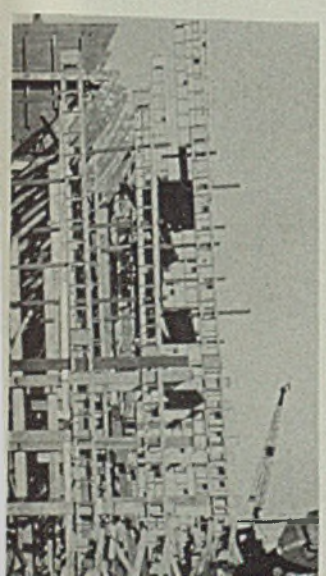
produces no templets whatever for flat plating but instead issues a tabulation of plate sizes. All plating is received finished to exact size and entirely devoid of all datum lines. Platens are lined off for each assembly by liner-offs and the plating is assembled accordingly.

Inner bottom weldments consisting of assemblies made of inner bottom plating, vertical keel, floors, pipe tunnels and intercostals are assembled in an upside down position, thus providing a maximum amount of downhand welding. Such sections weigh up to 35 tons. All heating coils are installed prior to erection on the ship. All other weldments such as bulk-heads, shaft alleys, side shell plating and decks are assembled with stiffener, beam and frame side up and completely welded manually while in this position.

Manual welding of subassemblies on the platens has the desirable advantage of permitting the joining of beam stiffeners and frames to proceed immediately after the plating has been assembled, thus making possible the continuous assembly of weldments without interruption.

Unionmelt automatic welding is applied extensively for all finish welding of seams and butts on all flat surfaces. Where possible this welding is completed on the ground prior to erection. However, where this is not convenient, the welding is completed after erection on the ship. On page 46 is a portable Unionmelt welding machine finish welding a flat seam. This process gives a smooth uniform weld of good appearance and of unquestionable quality.

As prefabrication of assemblies reaches a point where a sufficient amount of material has accumulated, flat keels together with entire bottom shell plating are laid. Laying of the flat keel is immediately followed by erection of the entire flat portion of the bottom shell together with approximately 80 rolled plates. The regulating completed, this entire group of 80 plates is welded, prior to erection of inner-bottom assemblies, using the Unionmelt process. The erection of all inner-bottom weldments from the fore peak to the after peak bulkheads follows in rapid order to form a definite foundation for remainder of the vessel.



Automatic welding of seams is done rapidly using portable Unionmelt equipment pictured at extreme left. Immediately at the left is shown staging supports and framing out of the vessel

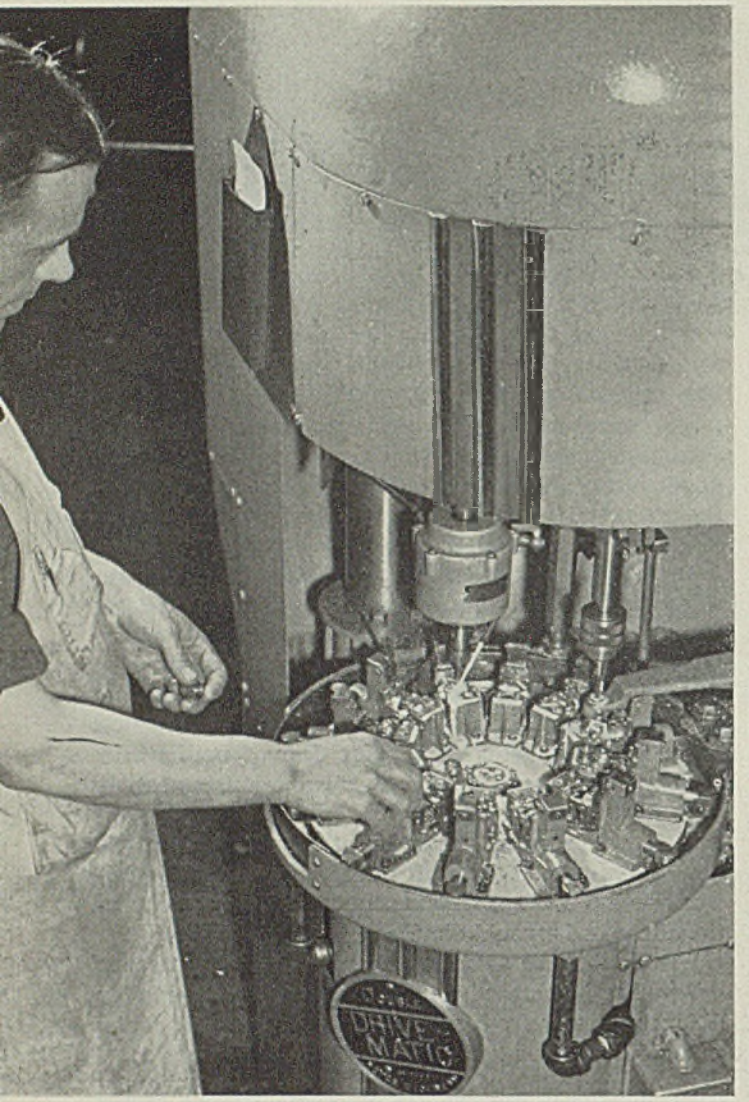
Before the erection of an all-welded ship can be considered successful, it must have been erected at least as quickly as a riveted structure and, in view of the huge amount of ground assembly, should actually be erected in somewhat shorter period of time. To accomplish this without the advantage of any erection holes whatever requires a great deal of preliminary planning as all conditions that might result in possible delays must be anticipated. That this is entirely possible is evidenced by the speed at which these vessels have been erected. Time for erecting principal steelwork on a C-3 cargo ship is about the same as conventional methods would dictate.

Erection of the structure above the inner bottom is believed to be somewhat new and novel and certainly differs radically from accepted practice. As all of the lower side framing terminates at the inner bottom margin plate and the underside of the third deck, thereby providing no means whatever of attachment to either of these structures, it was decided to erect on the inner bottom a substantial structure of shores and rib bands, carried up to the level of the third deck. The transverse and longitudinal bulkheads between the inner bottom and third deck having been erected, the deck assemblies next are placed in position on the shoring, thus automatically providing a means of attachment for the ground assemblies of the side-shell plating and framing.

While the inner-bottom plating amidship forms a natural support for the above described system of shoring, difficulties were experienced at first towards the ends of the ship due to the rapid decrease in width of the inner bottom and the rapidly increasing flare of the side framing. Now however, the outboard line of shoring is carried clear of the inner bottom and down to the concrete slab of the slipway itself, thus providing adequate support for the widely overhanding deck. This procedure is followed for each successive deck.

Shoring and erecting of materials for the extreme ends of the ship requires special treatment. The elimination of the third deck at No. 5 cargo hold creates an extremely deep hole. A ground assembly of all-flanged plate girders, forming the cargo hatch of the second deck level, is made in a complete assembly and

(*Please turn to Page* 80)



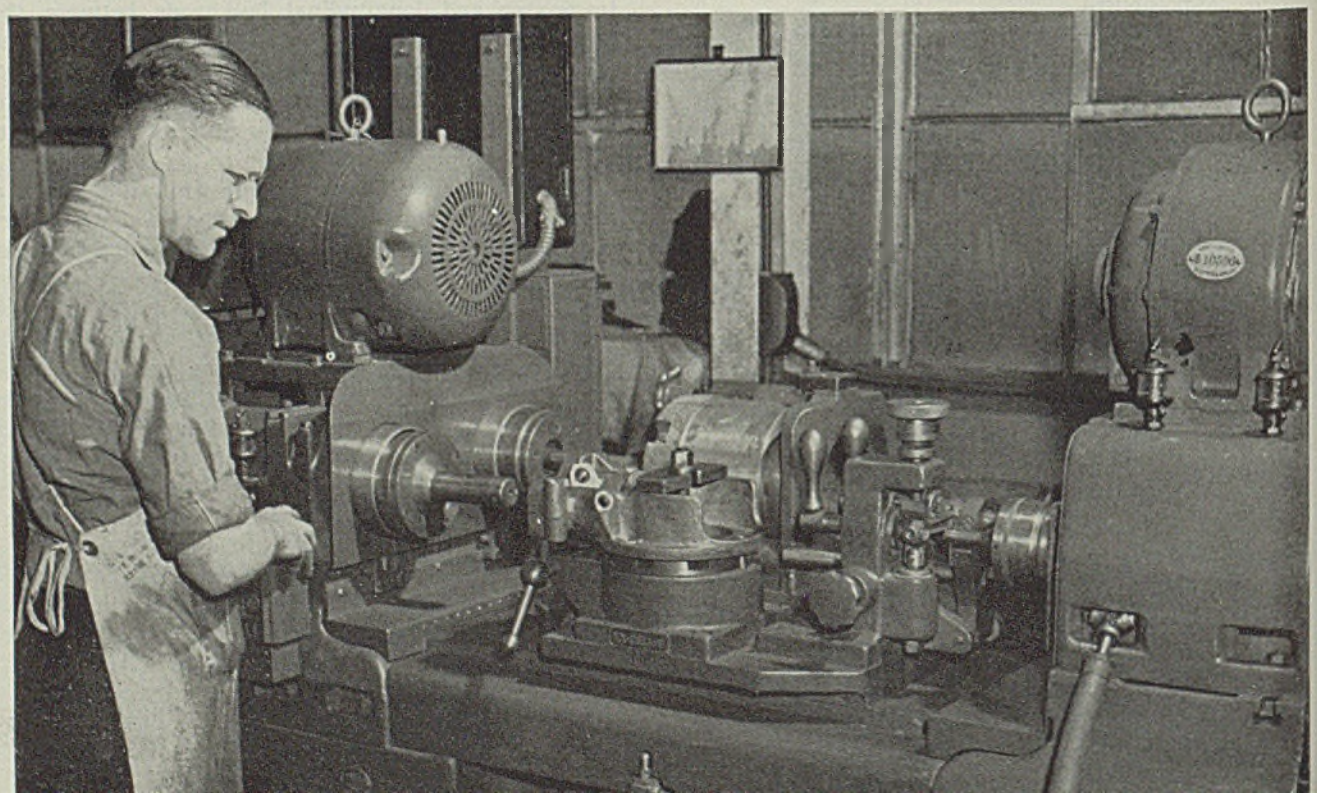
Mass Production Methods For Short-Run Work

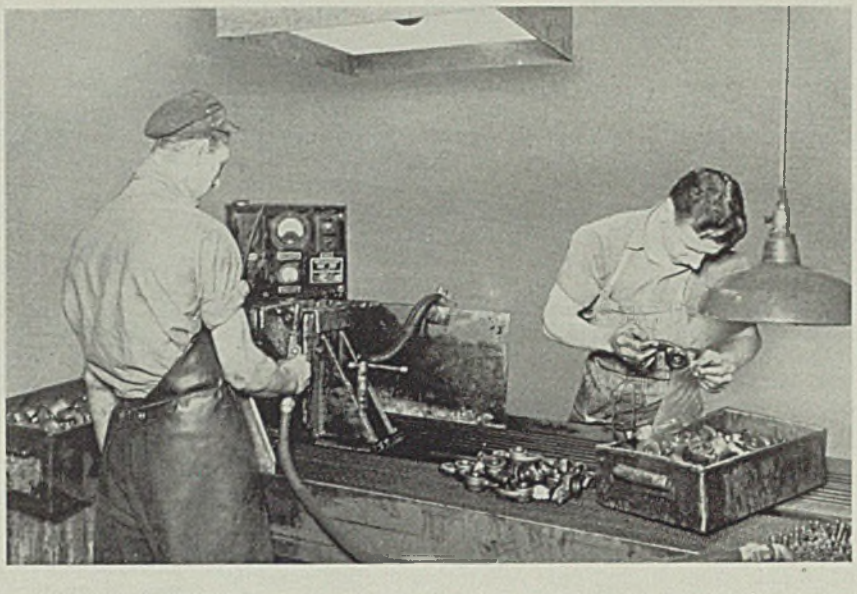
■ FIXTURES can be versatile as well as highly specialized. Ingenious fixtures often permit a single machine tool to produce to variety of parts without sacrifice of speed or accuracy. One machine may do many jobs.

Accompanying examples are from East Springfield, Mass., works of Westinghouse Electric & Mfg. Co. and are typical of up-to-the-minute practice. At left is a group of radially mounted fixtures on rotating table of a machine drilling and reaming fan hubs. A change in chuck jaws, drill and reamer sizes quickly adapts the setup for handling other small parts. Table revolves counterclockwise, the drill at right being guided and the reamer at left running free in the drilled hole. Fixtures operate automatically as the operator merely removes the completed work and places unfinished work in the open fixture. Each fixture has a clamping rod operated by a shoe at the extreme periphery which contacts a cam opposite the work stations as the fixture revolves, clamping the piece in position for working. Immediately past the reaming station, a spring opens the fixture to release the work. Operator need not operate clamping device, this being done automatically.

In multispindle boring machine below, left rear spindle is finish boring shaft bearing in a refrigerator compressor housing. Left front spindle is finishing a cylinder bore for same compressor. Two spindles at right bore crankpin end and wristpin end respectively in connecting rods. New tools can be substituted quickly when needed for machining new parts. This setup applies mass production methods to short-run work by machining three separate pieces in one setup. Capacity of machine thus can be utilized effi-

(*Please turn to Page* 80)





Forgings for Aircraft

Exceptionally close control methods assure perfect forgings. Heat identification maintained. Each bar spark tested just before delivery to forging hammer. All pieces are Magnafluxed

By JAMES ALLISON

Secretary
Billings & Spencer Co.
Hartford, Conn.

■ THE AIRCRAFT industry's development of larger, faster and stronger planes has resulted not only in a greater dependency on forged parts but also in their use in rapidly increasing numbers. While forged parts have been adopted for highly stressed members in many instances, their high strength and dependability also makes them valuable as a means of reducing the weight-to-strength ratio of other portions of the structure. Thus die forgings have been a principal contribution to the development of modern aircraft.

Aircraft forgings must feature lightness of weight and high quality of finish combined with the great strength inherent in forgings as such. To meet these requirements, the practice of making quality forgings has been steadily improved over the 15 years Billings & Spencer Co. has specialized in aircraft forgings. This work today increasingly demands closer tolerances, tougher alloys which must be forged into thinner sections, more intricate shapes, closer control of direction of flow lines, closer control of heating temperatures and atmospheres.

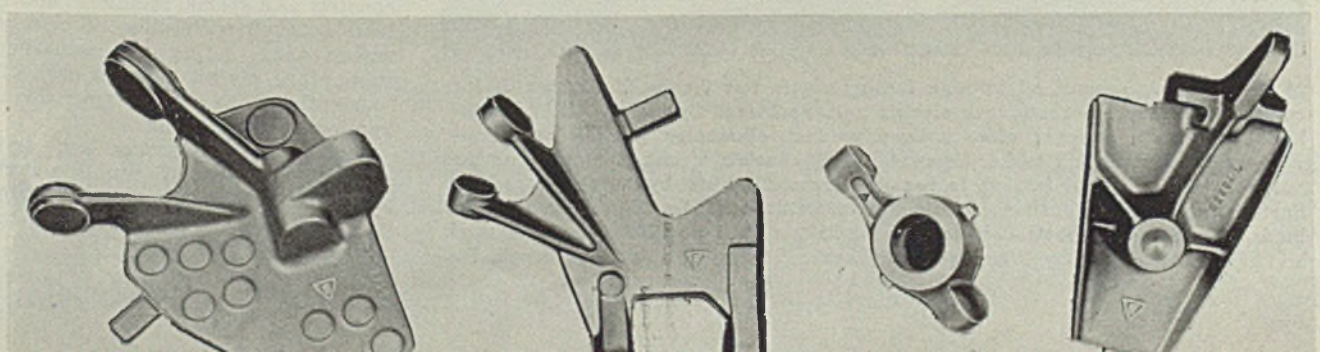
Many forgings, especially those for wings, fuselage and landing gear parts, have most surfaces completely finished and ready for plating when they leave the forge shop. Thin H-beams, I-beams and plates must have heavy sections located accurately so when they are bored or milled, only the minimum uniform wall thickness necessary for the strength of the part will remain.

Above, every forging is given a 100-per cent inspection and Magnaflux test to be sure it is perfect in every respect. Below, typical aircraft forgings

A few such parts are illustrated.

The first step in meeting the requirements of aircraft forgings is the proper design of the dies. The die must produce intricate shapes having the grain flow in the relation demanded by the service requirements of the part. This factor often imposes limitations on the method of making the part and so necessitating considerable ingenuity in die design. The metal must not be over-stressed in forging but must be hot worked enough to produce highest quality. The die must cause tough alloys to flow evenly to all parts of the impression with minimum wear at the corners and edges so satisfactory die life will be obtained while producing forgings within close limits.

To accomplish this, the preparatory operations must produce a correctly proportioned blank which will insure the proper flow in the blocking and finishing impressions with the least number of blows of the



hammer. Otherwise thin sections will chill before the forging is completely filled and down to size.

Because hot working is necessarily accompanied by scaling, the die must provide means of getting rid of the scale so a finish suitable for aircraft parts will be obtained. Although the number of pieces required from the dies often is small, it is generally found advantageous to use highly alloyed die blocks and to provide enough preparatory impressions to shape the forging as nearly to the finished part as possible before it goes into the finishing impression.

Often it is advisable to provide a second set of dies for a reforging or hot coining operation performed after the forging has been cooled, cleaned and trimmed. This "hot dropping" or hot coining operation gives closer tolerances, better finish and a reduction in thickness of the flash line.

Magnaflux inspection brings to light a type of defect that ordinarily is not visible, but which must be considered in die design for aircraft forgings. This defect shows up as a lap from 0.002 up to 0.040-inch deep. While it may occur in numerous places, it is found most often at corners or radii of the part. Usually it is caused by small wrinkles formed when the metal is flowed horizontally and vertically at the same time. Sharp corners, small radii, and insufficient draft are most likely to produce this defect. The cure is usually the proper distribution of metal in the preparatory steps as mentioned before.

It is general practice to use only cold melt electric furnace alloys for all pieces except simple flange fittings or similar minimum-stressed parts. The alloys not only must be of finest quality but be free from non-metallic inclusions and from other defects of appreciable size to show under Magnaflux or step-down test. In the latter, test pieces are stepturned to different diameters, etched and studied under a microscope to determine proper alloy distribution and to check for any segregations.

Heat identification must be preserved most carefully at every operation to preclude any possibility of mixing grades. As an additional and final precaution against possible error, every bar is spark tested for uniformity of analysis immediately before delivery to the forging hammer in work at this plant.

Despite all that can be accomplished by die design and proper selection of materials, much depends upon the skill of the forger. To produce aircraft forgings properly, the hammer operator must not only be a skilled forger but he must be experienced in handling this particular type of work. He must know the materials he is forging and must understand the requirements of the part he is making and how the dies are laid out to meet those requirements.

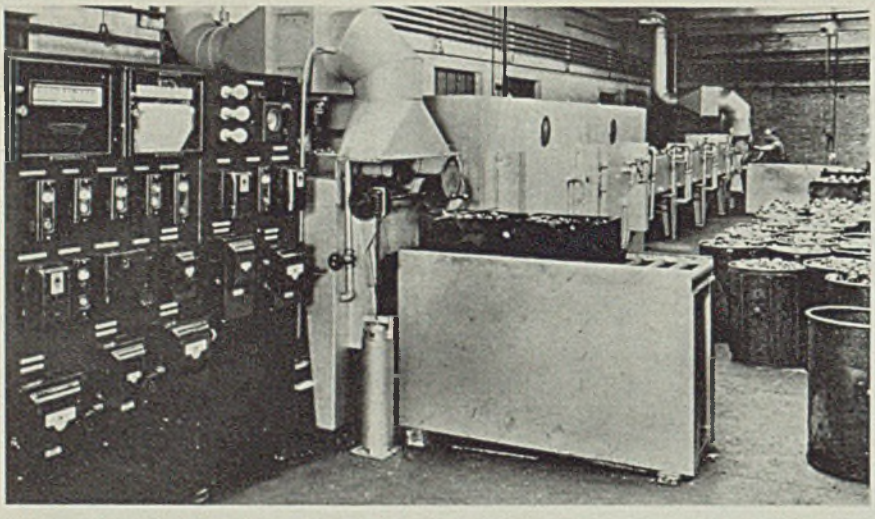
While temperature control equipment is helpful, it does not reduce the care that must be exercised by the forger. He must maintain correct atmosphere conditions in the furnace to hold scaling and decarburization to a minimum. After a few pieces have been made, it is good practice to stop the hammer until the pieces have been cleaned, Magnafluxed, inspected and etch tested to check grain flow and decarburization. Additional tests are made periodically while the order is being forged.

Subsequent operations of annealing, trimming, coining, straightening, grinding, normalizing, heat treating and cleaning must be covered by thorough metallurgical supervision and inspection at each operation.

A 100 per cent finished inspection and Magnaflux test of all aircraft forgings is standard practice at the Billings & Spencer plant. Each mark on the surface of a forging is checked by the inspector to see that it does not cover a defect. After all marks are removed, the forging is Magnafluxed again to assure that all defects, real or apparent, have been completely removed.

♦

Continuous Furnace Cuts Annealing Costs 25 Per Cent



■ By replacing several oil burning furnaces with this 3-zone 90-kilowatt 50-foot controlled-atmosphere continuous electric unit, Rockwood Sprinkler Co., Worcester, Mass., obtains a stronger, more uniform product, eliminates pickling operations, reduces batch variation to 0.4 per cent. Work consists of annealing pipe unions between steps in cold forging to remove stresses set up by the cold working. Fast operation of unit eliminates serious plant bottleneck. On 15-year amortization basis, new furnace shows cost savings of 25 per cent per 100 pounds of work handled. Photo courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Process Reduces Silica In Boiler Feed Water

■ To combat the presence of silica in water used for boiler feed purposes W. H. & L. D. Betz, 235 West Wyoming avenue, Philadelphia, have developed the Adsorption process which reduces soluble silica in any natural water to a fractional part. This process utilizes Remosil, a specially prepared magnesium oxide, and removal is effected in the hot process softeners. It is unnecessary to use other coagulants with this process in the softening operations. It also causes no increase in the requirements of lime and soda ash, but rather it effects lower hardness and alkalinity of softened water. This means of silica removal is low in cost.

Announces New Type Insulating Steam Joint

■ A new type of insulating steam joint compounded to resist steam and heat is announced by Hanson-Van Winkle-Munning Co., Matawan, N. J. It is called the Hose type, and consists of a special seamless rubber tube covered with plies of closely woven duck. Layers of insulating rubber are placed between each of these plies, with a heavy gage cover applied on the outside.

Each joint is 8 inches long and built to withstand 100 pounds steam pressure. It is equipped with a hose clamp on each end for attaching to standard size iron pipe.

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MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N.C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal—A. C. Leslie & Co. PRODUCTS INCLUDE—Steel Products in Carbon, Copper or Alloy Analyses : : Sheared Steel Plates : : Hot Rolled Sheets and Strip : : "A.W." Rolled Steel Floor Plates : : Billets, Blooms and Slabs : : "Swede" Pig Iron : : Reading Cut Nails.

Handling Built-to-Order

System capable of accommodating wide range of transportation requirements utilizes only three basic units but these are easily modified to fit special shapes or production demands

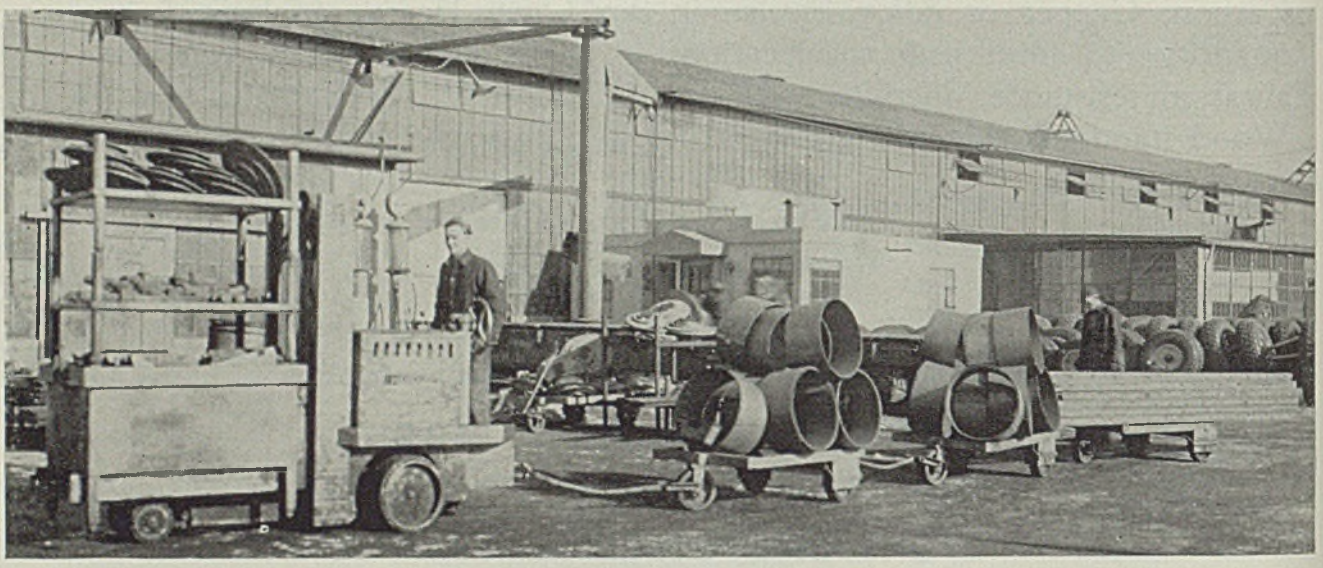


Fig. 1—Elements of an effective factory transportation system are seen here: The standardized skid boxes and skid platform being carried by the power lift truck, the trailers and jib crane mounted on side of building in rear

PART I

By WALTER J. BROOKING

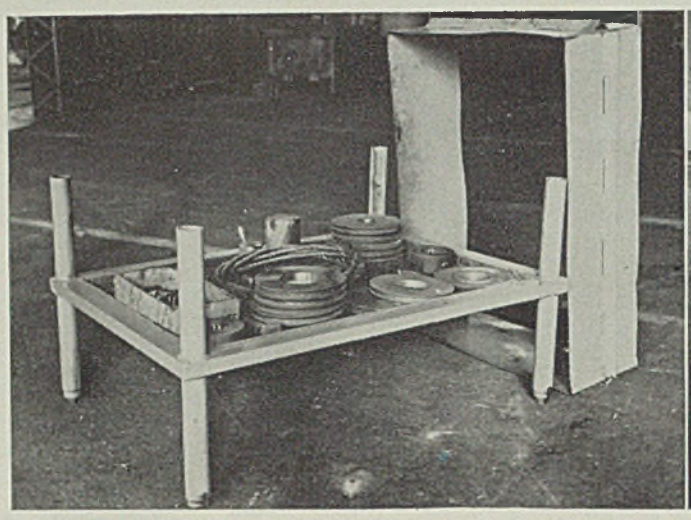
Engineering Department
R. G. LeTourneau Inc.
Peoria, Ill.

■ A MOST vital portion of any factory's organization and equipment is its transportation system. Efficient handling facilities are absolutely necessary, yet both the money invested in the equipment and the labor required to operate it are in the category of nonproductive expenses usually classed as overhead. And this factor of overhead often determines whether operation is at a profit or at a loss, so careful planning for effective handling facilities is just as important as actual manufacturing.

It is of utmost importance that amount of original investment and cost of maintaining the handling equipment be held to a minimum. The following material offers valuable aids in obtaining these results. Equipment for a factory transportation system involves three factors: Material and labor involved in making or purchasing the original equipment, cost of operating and maintaining it in service, and amount of space occupied. Space almost always is expensive, so handling facilities which best utilize space immediately have a great advantage over other equipment.

If such equipment is welded from standard steel plate and shapes, resulting units will have many advantages. They can be made light and strong by suiting them to the exact needs, often permitting greater loading per unit volume of raw material than otherwise would be possible. Such structures are extremely rigid and so can withstand severe treatment and abuse yet with maintenance costs held at a low level. Made of steel, such equipment is resistant to wear, wide temperature ranges, and is not subject to destructive action of fungi, termites, rats, etc. Also the material can be rendered resistant to chemicals by alloying or by application of a protective covering.

Possibly the most important advantage is that welded steel equip-



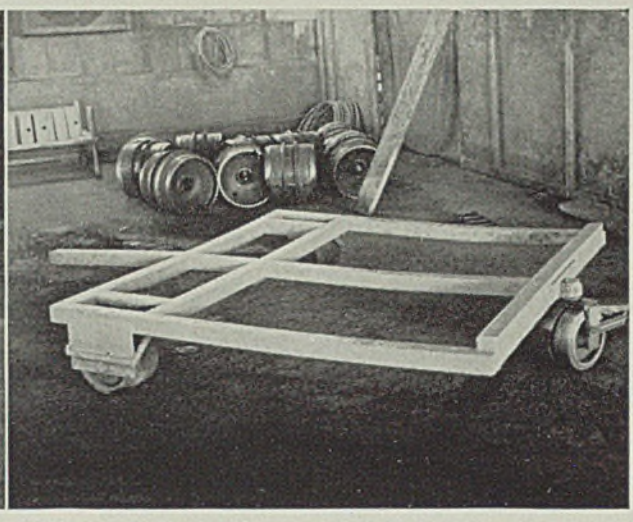


Fig. 2. (Upper left)—Loads are easily placed on or removed from this standardized skid. Removable sideboard shown standing nearby. Fig. 3. (Upper right)—Built-to-order handling units are exemplified by this buggy which handles large bulky objects. Fig. 4. (Lower left)—Special unit for handling material or assemblies on edge, permits moving about with minimum disturbance to nearby operations. Fig. 5. (Lower right)—Platform on wheels features maximum mobility

ment can be designed and built exactly to size with load carrying capacity and weight desired, and to fit exactly into the space available. The only limiting factor appears to be the ingenuity of the builder. Examples of arc-welded steel containers and machines for transportation and handling in a factory which manufactures heavy earth-moving equipment will serve to illustrate the practicability and economy of these suggestions.

A typical problem in plants spread over considerable ground and with a number of buildings and perhaps outside storage areas is to provide efficient transfer of material between buildings and storage areas. The method used should permit large numbers of small parts to be handled efficiently, and also make some provision for handling larger, bulkier parts, all with fewest possible trips and with interchangeable handling equipment of only one or two basic types.

The way these requirements have been met at the Le Tourneau plant involves a number of ideas which can readily be adopted by any manufacturer. The handling and transporting system is extremely flexible, complete and highly efficient.

It utilizes mechanical lift buggies and power driven lift trucks such as shown in Fig. 1. Here a truck is used to carry on the lift platform a stack of skid boxes or skid platforms and also to pull a train of trailers made up of various types of wagons and buggies. All the skid boxes and platform skids are interchangeable and thus can be stacked as shown in Fig. 1, where a skid box is supported directly from the truck platform with two skid platforms nested on top of the skid box.

Such containers and racks can be used universally, are extremely adaptable, can be nested for efficient storage in small floor space, are handy for loading and unloading operations, have high strength and serviceability and not only provide means of effective handling but also are useful to accommodate temporary or permanent storage of work placed on them.

Fig. 2 is a closeup of one of the skid platforms, many of which are provided with a removable sideboard structure like that seen standing at the right in Fig. 2. The sideboard enables the skid to hold large numbers of small parts. As will be noted, design of this skid platform is simplicity itself. The vertical pieces are lengths of pipe. The horizontal framework is made of angle iron and the platform itself is sheet steel. Assembled by arc welding, a strong, rigid, serviceable unit is formed.

Bottom ends of the corner pieces

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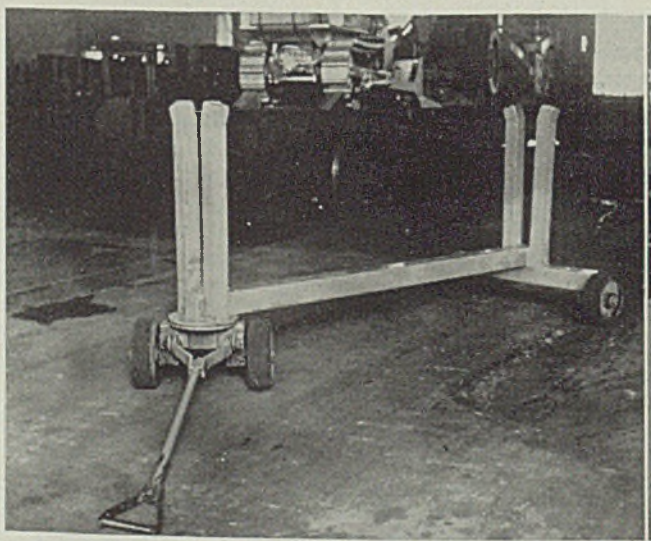


BETWEEN HEATS

WITH *Shorty*

■ Say Fellers:

I was breezin' through the plate mill one day last week on my way over to the office when the trouble whistle blew for the mill to shut down. Bill Swansen, the millwright and his crew jumped in to make some adjustments and some of the crew grabbed their dinner buckets and sat down on the bench to take a snack while they had a "spell" out.

"Slide over, Ol' Topper," I sez to Stubbie Mills, "and let a feller rest his bones." And with that I slid onto the edge of the bench.

Stubbie and I chewed the fat awhile 'bout a feller we both knew few years ago and the last thing he said 'fore the trouble whistle blew for startin' up the mill and sent him tearin' up the steps to his pulpit was, "Shorty, you oughta put this in your colum' sometime." And so, here 'tis:

Few years ago I was workin' at a little plate mill near the foot of Thirty-eighth street. Long 'bout noon each day the general manager would come out through the plant. Fine little feller he was. This day he rounded the corner of the pipe shop and then stopped abruptly.

There sittin' on a board and sorta leanin' up against the buildin' was Mike Rusko, one of the yard sweepers. His dinner pail was open but half its contents was untouched. His head was bowed between his knees. He was sobbin'. His body shook intermittently.

The general manager took a few paces, stooped over and touched Mike's shoulder and he sez, "Whatsa matter, Mike?"

Risin' to his feet, Mike muttered a few words while wipin' his tear-stained cheeks with a dirty bandanta and then continued, "Nothin', Mr. Boss, I guess. Me catch 'em wife and four kids in ol' countree long time ago. Alla time I senda lotta money. Plenty of war now. No gettum letter longa time and I say 'maybe plenty trouble, maybe killed.' So I done know, plent trouble all time. It's a' right, Mr. Boss, it's a' right."

"How long has it been since you've seen your wife and kids?", inquired the general manager.

"Long time, Mr. Boss. No see 'em maybe for a twelva year," Mike replied.

"How'd y' like to go over to the ol' country for a visit?"

"Me go over?" Mike asked. "No can do, Mr. Boss. No gotta money."

"Suppose I give y' ticket, Mike. How soon could y' go?"

"Y' mean real ticket? Say, Boss, I I go right now, I betcha your life."

* * *

When the general manager arrived at the office next mornin' he found Mike waitin' for 'im. He was wearin' his best "bib and tucker" and had a suitcase that looked more like a young trunk. Y' should 've seen the expression on his face. I betcha he hadn't slept a wink all night.

After discussin' the trip with Mike, the general manager inquired how much cash he had with 'im. The yard sweeper opened his old fashioned pocketbook and displayed a few dollar bills. "That all y' got, Mike?"

"Yea, that's 'nough. I catch 'em some box a crackers in trunk. Anyway, me catch 'em lotta ol' country men on boat and I say, "Hey you, give me for one bite your bread and pretty soon me no hungry, I betcha."

And y' know, fellers, the Boss had a dickens of a time persuadin' Mike to take $25. But he did and then he backed out of the office bowin' and sayin' "Thank y', Boss," over 'n over again.

* * *

'N fellers, 'bout seven months later the general manager's 'phone bell rang and liftin' the receiver he listened to a story the operator poured into his ear. "That so," he sez. "Send 'em in."

Pretty soon his door opened and in stepped the yard cleaner, Mike Rusko, followed by his wife and four kids—all dressed in ol' country style. And say, fellers, if you'd ever seen a family that bowed low, y' shoulda seen this one. Thought for awhile they'd all get splinters in their noses.

After a lengthy conversation, with Mike acting as interpreter, the family bowed itself over the threshold and out along the mill fence they went with Mike leadin' the way to the newly established quarters. Next day he reported at the plant bright and early and 'fore the day was over every workman in the plant knew the story.

* * *

But, fellers, that 's not the end of the tale. A few weeks passed and one morn.n' the news spread 'round the plant that the general manager's daughter had been stricken with spinal meningitis. Few days later they hung a wreath on the door of the Boss' house.

Somehow the mill seemed to turn in its bearings more quietly than ever before. Workmen went 'bout their tasks and you'd see 'em stop and "chin" with one another jus' a minute or so.

An' when the noon whistle blew the men went into a huddle. Few minutes later a delegation of three struck out 'cross the yard and headed toward the president's office. They got to 'im jus' 'fore he was leavin' and they tells 'im what they boys over in the mill had on their minds. They sez, "all the fellers out in the plant are goin' to the funeral of the Boss' daughter tomorrow afternoon, so we'd sorta like to know what the chances are of shuttin' down from 2 to 4?"

"Sorry, men," he sez. "We jus' can't do a thing like that. We'd like to, but it jus' can't be done."

Well, 'fore the delegation turned away they let it be known that there wouldn't be any men in the plant durin' the time of the funeral.

An' you know, fellers, that was the case. Every last man was at the funeral. Even members of the parrish where Mike Rusko, the yard sweeper, attended were there in a body. All paid respects to the Boss' daughter. Some were in their workin' clothes, but that didn't make any difference.

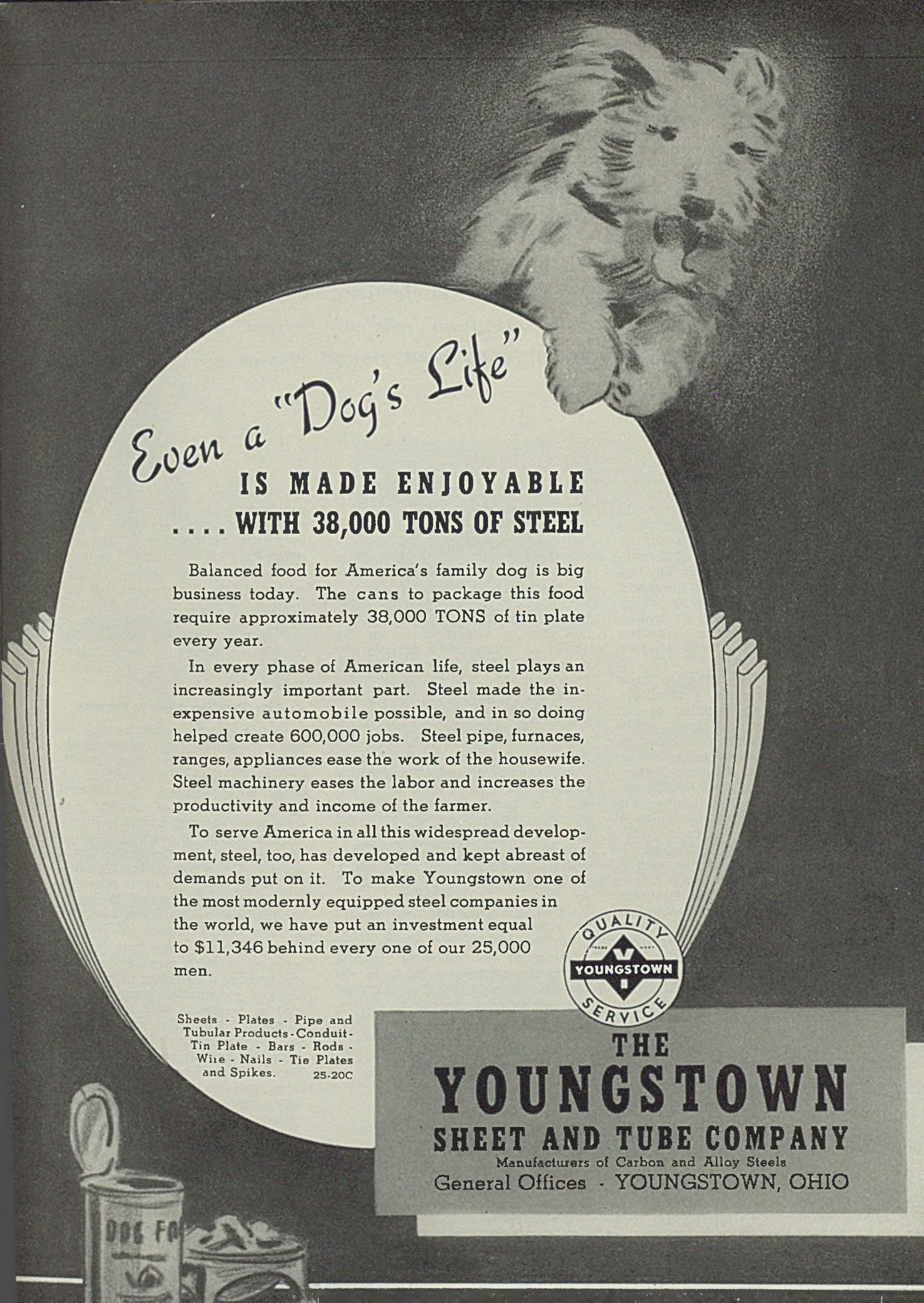
* * *

Want to know the name of the Boss who won his way into the hearts of those men? His name is Harry E. Higgins who at that time was general manager of the Cleveland Steel Co., since liquidated. He was vice president of the Otis Steel Co. for seven years, retiring in 1918 to take up residence in Palo Alto, Calif. He was killed in an airplane accident Aug. 11, 1928.

Never learned who received the greatest joy out of that trip to the ol' country—the Boss or the yard sweeper. Guess both of 'em shared it. Jus' goes to show what they sez 'bout throwin' bread on the waters: it 's usually found 'fore many days. Ever try it?

Well solong, fellers. I'll be seein' you.

"Shorty" Long


Even a "Dog's Life"
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Current Distribution

Improved weld quality, greater production, less waste of rod and operator's time result from efficient current distribution. Flexible electrode cable, good ground clamps essential

By HAROLD LAWRENCE
Welding Engineer

■ LACK of an adequate current distribution system leads to poor welds and lowered production in any welding department, large or small, old or new. Latest recommended practice for best and most efficient method of getting the welding current to weld is presented here as proper attention to this phase of welding will pay good returns in improved welds, higher output and lowered costs.

Perhaps first consideration goes to the electrode cable, particularly the last few feet attached to the electrode holder. Unless easily flexed, early operator fatigue results. Stiff electrode cable means the operator must divide his attention between a stiff balky cable and the delicate maneuvers required for proper welding. He either masters the unruly cable, expending far more energy than should be necessary, or produces a poor appearing weld of questionable quality.

Fortunately cable manufacturers make a very flexible cable designed especially for welding service. One such cable has seven major strands, each of these strands further subdivided into seven minor strands each of which contain some 83 wires. However, the number of wires is not the only factor. Many small wires plus paper wrapping as well as an inner and an outer rubber sheathe with braided cotton cords between—all help produce the desired limberness.

The outer rubber covering must not only be strong but also tough and able to withstand the cutting action of sharp steel parts while giving a satisfactory amount of abrasion resistance. At the same time, sufficient insulation must be provided to prevent shorts.

Selecting the proper size cable for length, service and current also is important. Table I will serve as a guide, using the smaller sizes for intermittent service and the larger sizes for continuous service where a size range is given. Many shops find it advantageous to use the larger size cable for all welding operations, feeling that such standardization is justified by longer service life.

Of equal importance is the matter of proper grounds. In itself the ground connection is a simple thing that would not seem to warrant particular attention. Such is not the case. For I distinctly remember one welding operator who was having a great deal of trouble with a poor straggly weld. How many times he went back to his machine to adjust the current setting, I could not guess. But it was a large number. And in spite of his efforts to rectify his troubles at the machine, the weld continued to be poor.

A simple check of the welding circuit disclosed the source of the trouble. A piece of scrap steel had been laid from a ground strap to the weldment and was arcing badly, giving a fluctuating ground that almost extinguished the arc, causing a poor weld.

Lug Provides Smooth Current

A sure ground connection may be had by bolting a lug to the work. Such a lug is shown in Fig. 1 which also illustrates cable connectors. A bolted lug guarantees a smooth and uninterrupted flow of current. Another good ground clamp is shown in Fig. 2. Here a spring assures good contact with the work without necessitating a hole for bolting a lug. Of course there are many other effective ground clamps. In heavy welding service, good ground connectors are of utmost importance.

Because the distance from welding machine to work may vary greatly and because 4/0 welding cable represents a substantial investment as well as weighing over 800 pounds to the 100 feet, good welding practice demands that lead and ground cables be kept as short as possible. The use of male and female plug-in connectors shown in Figs. 1 and 2 will permit welding leads to be adjusted to the needs of the operator.

Usual practice is to keep a supply of welding cable in standard 50-foot lengths on racks at strategic points throughout the shop. The operator selects a sufficient amount of cable from this rack. Each night the electrical department maintenance men coil the cable and replace it on the

Table 1—Cable Sizes

Welding Machine Rating (Amperes)	Length of Cable		
	Up to 50 Feet	Up to 100 Feet	Up to 250 Feet
100	5–2	4–2	3–2
200	2	1	1/0–2/0
300	0–1/0	1/0–2/0	2/0–4/0
400	2/0	3/0	4/0
600	2/0–4/0	4/0	*

*Not recommended over 100 feet; use 300,000 circular mill cable.

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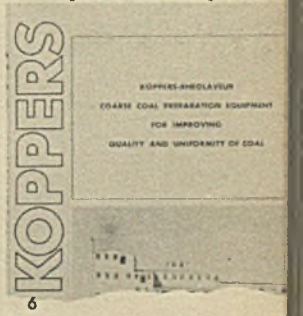
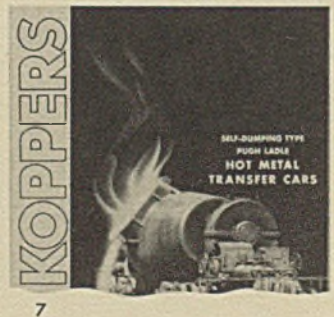


6 How to use less coke, l slag, less blast power per t of pig and yet get bet metal and better productio



7 How to get low cost transportation of molten metal . . . how to solve clearance problems on hot metal ladle cars.

8 A brief description of the coking qualities of a variety of different coals. Which coals are best suited for coke?

9 How to get the highest best combination of ductili hardness and strength in n ferrous castings and forgi

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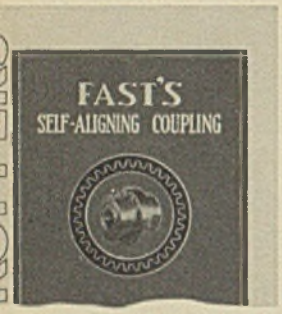

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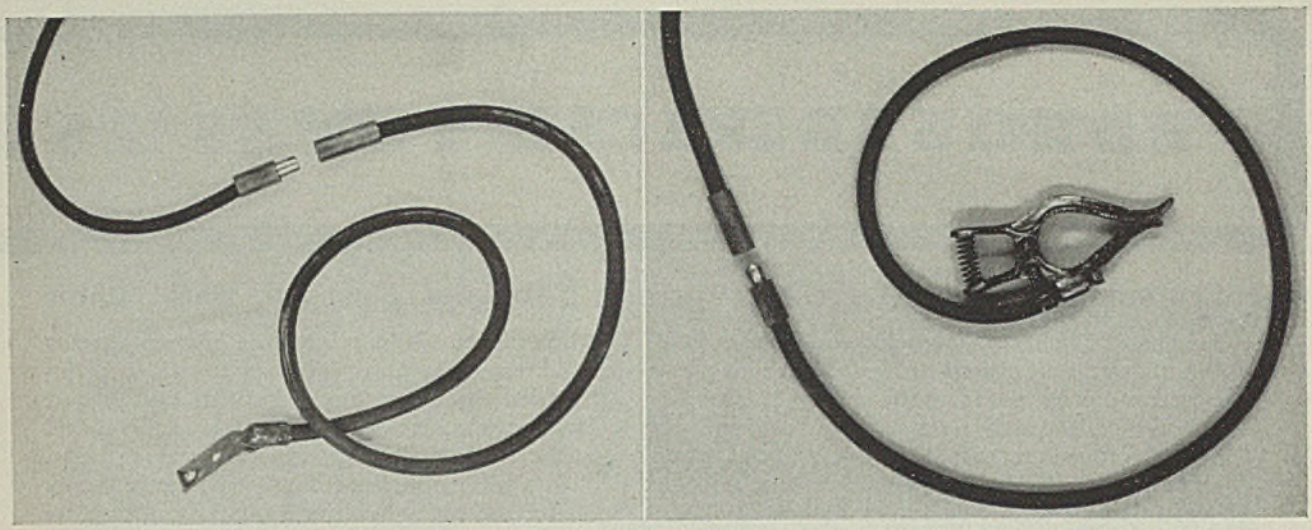

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♦

Rubber Lining Useful For Copper Plating

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The lining comprises a layer of hard rubber construction cushioned between two layers of softer rubber, the three plies being vulcanized together to form an integral structure. Adjacent sheets of the 3-ply material are overlapped to form expansion joints in which the hard rubber layers are separated, this permitting tanks to operate with wide variations in temperatures without damage to the lining by expansion or contraction.

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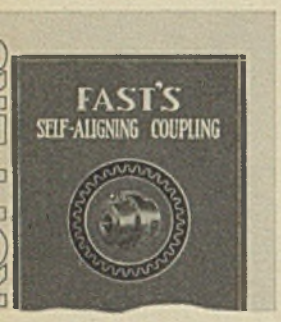

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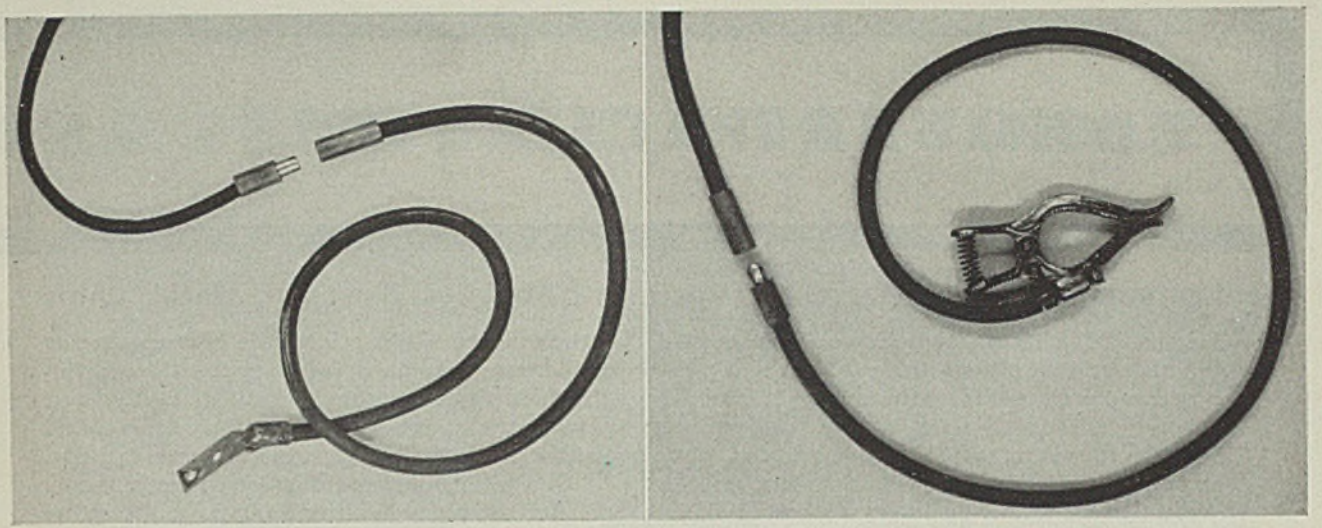

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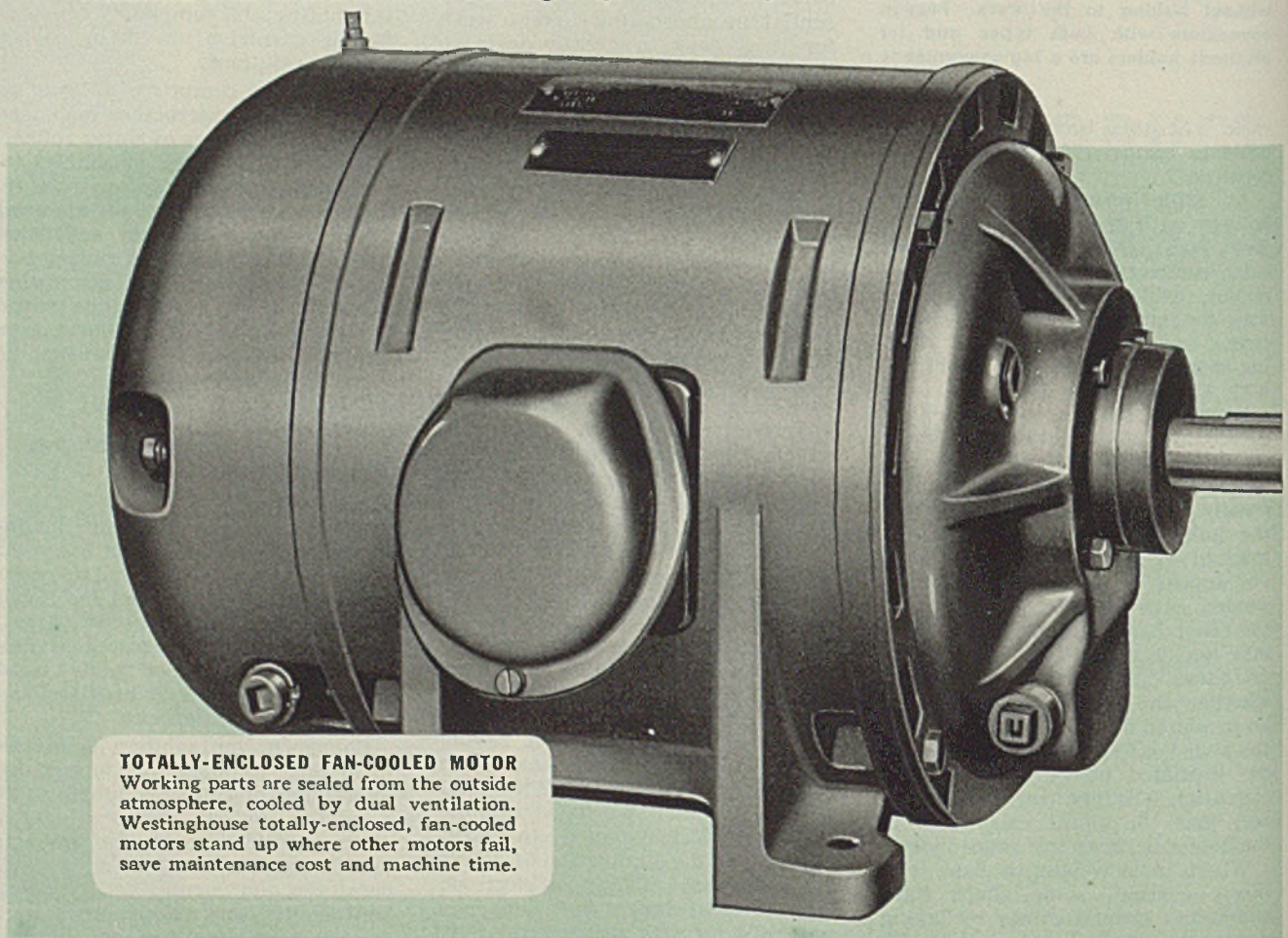
CONQUERS ACID FUMES AND

Protected Against Corrosive Gases . . . Abrasive Dust . . . Metal Chips

Acid can't damage this motor's windings because windings and all other vital parts are safely enclosed and protected from the attacks of external forces. Under a barrage of corrosive gases, abrasive dust, metal chips — conditions that ruin motors designed for normal service—the Westinghouse totally-enclosed, fan-cooled motor delivers trouble-free performance. Rewind expense and production losses are eliminated.

This motor has been specifically designed to meet the requirements of the severe operating conditions often found in metal working shops where chips, falling into the motor, destroy windings. It is particularly suited to those industries where motors operate in heavy, dust laden atmosphere or where corrosive gases or acid might work their way into the working parts.

The totally-enclosed, fan-cooled motor is only one of the many Westinghouse motors that has been designed to meet specific service requirements. There are many others. To be sure of getting low maintenance cost and dependable service consult your Westinghouse representative on all your motor applications.



TOTALLY-ENCLOSED FAN-COOLED MOTOR
Working parts are sealed from the outside atmosphere, cooled by dual ventilation. Westinghouse totally-enclosed, fan-cooled motors stand up where other motors fail, save maintenance cost and machine time.

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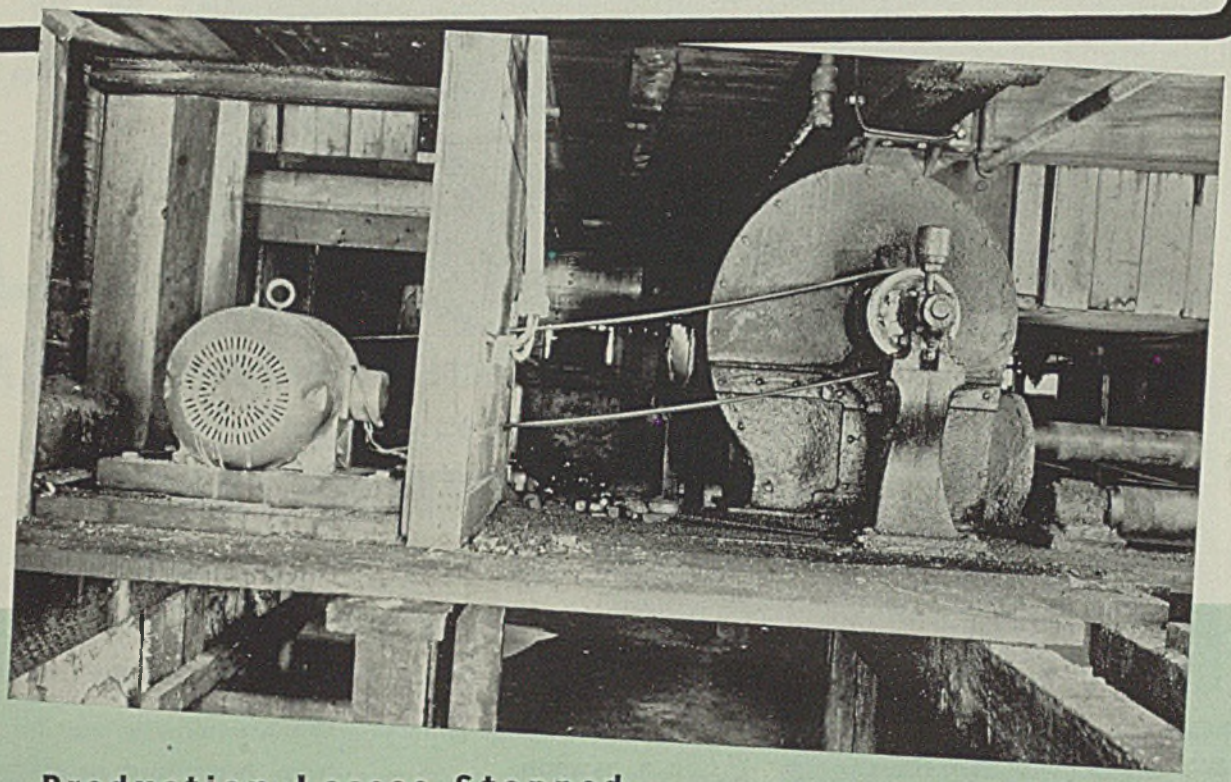
Westinghouse

PAYS FOR SELF IN ONE YEAR



Production Losses Stopped
Rewind Expense Eliminated

Destructive effects of sulphuric acid fumes on an open motor cost the Newman Crosby Steel Company of Pawtucket, Rhode Island, $840 in six years for motor rewinding alone. In addition there was the expense of maintaining a spare motor on the job at all times and the labor of shifting the regular drive in and out of service each time it had to be rewound.

A year and a half ago the company solved the problem completely by replacing the open motor with a Westinghouse totally-enclosed fan-cooled motor. Since that time not a penny has been spent for rewinding or other motor maintenance. Considering only the cost of rewinds it has saved, the new motor returned its first cost of $140 in one year.

Similar opportunities for savings may exist in your plant. A letter or call to our local office will quickly bring a Westinghouse engineer to help you find them.

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East Pittsburgh, Pa.

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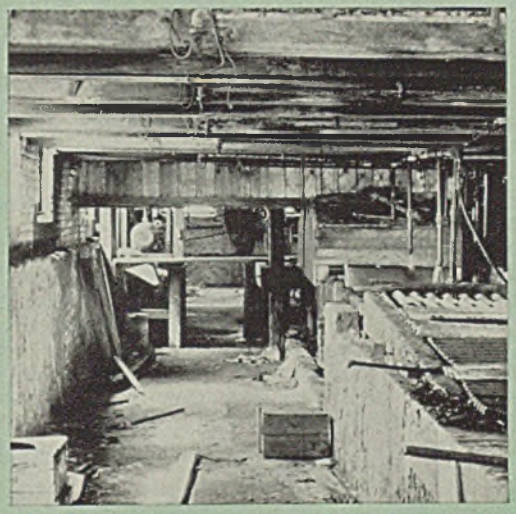


Production losses are reduced because the greater reliability of the new Westinghouse drive keeps the steel moving through this pickling liquor tank . . . breakdown of drive would cause spoilage of steel left in tank beyond its normal period.

Motors and Control

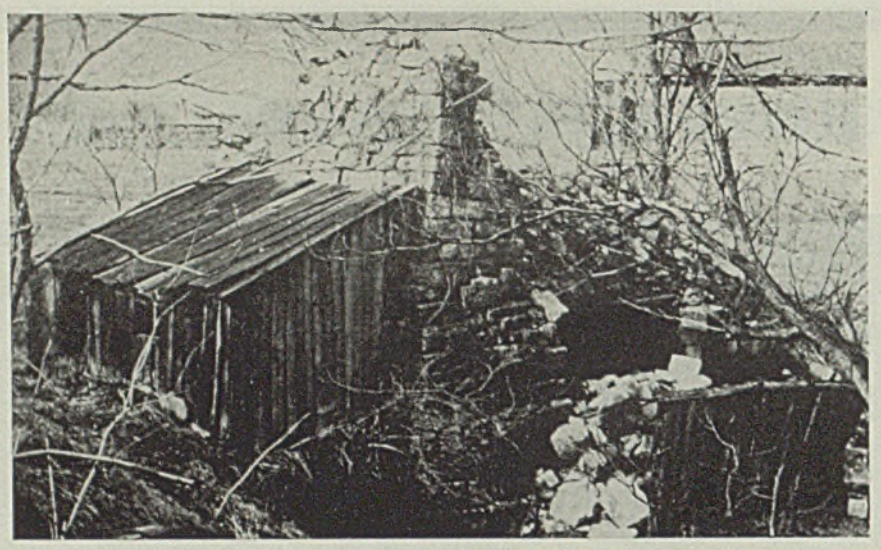


Fig. 1—Rebecca furnace, near Salem, O., as it appeared in 1892

Old Stone Furnace

Rebecca stack, near Lisbon, O., built in 1807, had a capacity of 2 tons per day and a fuel ratio of 200 bushels of charcoal per ton of iron. Melt sold at $90 a ton. Ore mined nearby

E. S. DAWSON
Superintendent
Deming Co., Salem, O.
and
M. H. Mawhinney
Consulting Engineer
Salem, O.

■ ON THE OUTSKIRTS of Lisbon, O., the Columbiana council of the Boy Scouts of America has acquired a reservation of some 125 acres of wood land and with it, a wealth of remnants of the romance of long ago. Romance of the human variety is represented in the well-preserved mansion house of stone, in which the grandparents and parents of President McKinley lived for many years before the President was born; industrial romance also is embodied in the remains of one of the earliest blast furnaces to be built in the Middle West.

The physical condition of this furnace in 1936 at which time the authors became interested was a large grassy mound of earth near the Beaver Creek which runs through the reservation. As a result of weekend digging extending over a period of about two years, it has been possible to rediscover the essential features of the furnace, which had been buried by the many floods in the 130 years since the furnace was built.

According to early records, a Gideon Hughes made the strenuous and hazardous trip across the Alleghenies from the East to the frontier marked by the fork of the three rivers at Pittsburgh, and continued on some 60 miles further west to the new town of New Lisbon, which is now Lisbon, O. Here he found conditions favorable for the location of a blast furnace and built the Rebecca stack, named after his wife and companion in these journeys. The exact location for his furnace was 1½ miles north west of Lisbon on the middle fork of the Little Beaver creek.

Original product of the furnace was a 10-plate stove for wood burning, which was a cook stove as well as a source of heat for the early pioneers. The stove was the "Rebecca of New Lisbon," the name being cast in the iron plates of the stove; one or two of them are still in existence. The superiority of the 10-plate stove is referred to in the diary of Benjamin Franklin in Philadelphia. Additional products of the furnace were plow irons, dog irons, pots and kettles.

The business prospered from the start and in 1821 Mr. Hughes in partnership with Joshua Malin and with other interested business men

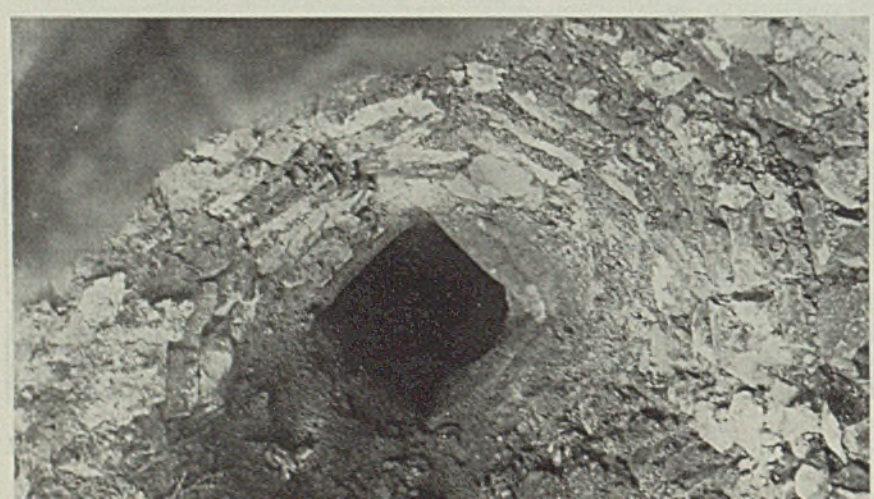
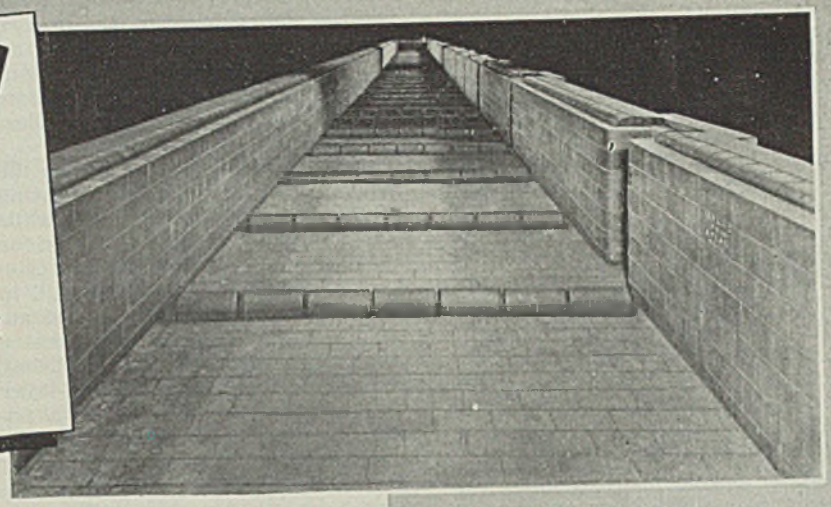
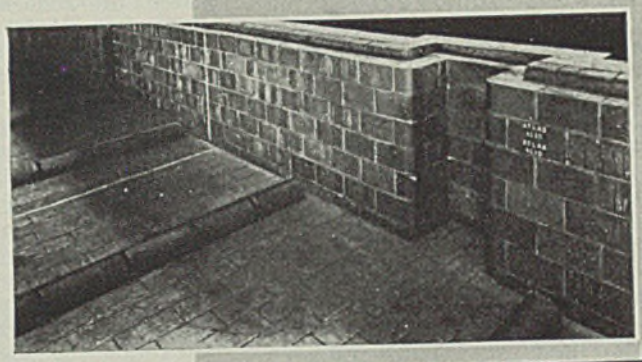


Fig. 2—View of furnace shaft looking down into the bosh and hearth

165' x 9' x approximately 3' DEEP



LARGEST INDIVIDUAL *Dual Construction* PICKLING TANK



This continuous pickler for narrow strip steel was recently installed in the Riverdale plant of the Acme Steel Company, Chicago, one of America's largest producers of hot and cold rolled strip steel, cooperage hoops, box strapping, unit load band and various other strip steel specialties. It replaces the old type lead lined wooden pickling tanks.

NEW CONSTRUCTION TO MEET NEW CONDITIONS

Brick lined pickling tanks were formerly built for operating temperatures below 200° Fahr. New conditions call for higher production from same equipment . . . and this means higher operating temperatures.

Dual Construction, developed by Atlas, withstands temperatures to 250° Fahr. The Acme tank pictured above will be operated at well above 200° Fahr., and will not be affected by overheating from *any* operating condition.

TWO NOTABLE FEATURES of its construction are:

(a) Atlas Improved Expansion Joints. (b) New type Skid Blocks with no projections or corners that might break off in service.

Atlas Dual Construction consists of a combination brick lining in which a chemically setting synthetic resin cement called KOREZ is used in the brick course next to the corrosive bath, and molten Tegul-VITROBOND is poured into the joints of the back course of brick. The heat given off during solidification of the VITROBOND converts KOREZ Resin Cement to its final set in a short time. The equipment is then ready for immediate service.

This construction, already in service in a number of America's larger chemical plants, steel mills and metal refinery plants, has proved its superiority.

SIX IMPORTANT ADVANTAGES of ATLAS DUAL CONSTRUCTION

1—Inert to both hot acid and hot lime solutions.

2—Withstands operating temperatures to 250° Fahr.

3—Unaffected by local overheating, whether from faulty steam jets or from heat generated by the addition of concentrated acid.

4—Unaffected by abrasion or turbulent liquids.

5—Construction requires less labor.

6—Resistant to water and oils.

Our Engineering Staff is prepared to submit recommendations and estimates without cost to you—and to construct, or supervise construction of any type of acid-proof equipment. Write for Technical Literature.

Patents applied for on all important features of Atlas Dual Construction

THE ATLAS MINERAL PRODUCTS CO. OF PA. MERTZTOWN, PA. ESTD. 1900
The House of Jointing Materials

Atlas Mineral PRODUCTS COMPANY OF PENNA.

MERTZTOWN, PENNSYLVANIA

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*DETROIT, Mich. 2970 W. Grand Blvd.
*SAN FRANCISCO, Cal. 721 Bryant Street
*CHICAGO, Ill. 1442 Cullom Avenue
*KANSAS CITY, Kan. 647 Ann Avenue
NEW YORK CITY 280 Madison Avenue
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*LOS ANGELES, Cal. 817 Yale Street
PITTSBURGH, (10) Pa. Old Boston Road
TORONTO, Ontario, McRae Engineering Equipment, Ltd. 11 King Street, West.

*Stock carried at these points.

from Pittsburgh, built a rolling mill, forges, and nail machinery farther up the creek. About 1830 it appears, from the files of the *Lisbon Journal*, that Mr. Hughes failed financially and that Benjamin Wilson and Perry Doyle became owners of the plant. The property of Benjamin Wilson was that which was later acquired by the grandfather of President McKinley, after whom the present Boy Scout reservation is named and it is said that the father of the President lived there until about two years before the birth of the President in Niles, O. From the records it appears that a great flood in 1832 destroyed the mill and machinery, after which no further operations were carried on.

A later development of historical interest was the Beaver and Sandy canal which passed through this same property. The dam and locks can still be seen. This venture in 1845 caused the loss of much money to people in the neighborhood, as only one boat ever went through the canal after it was finished.

Ore continued to be mined in the vicinity, which was shipped to the nearby and now dismantled Cherry Valley furnace at Leetonia, O. and to other places; and the old furnace was used as a shelter and place for sharpening the miners' tools. The waterwheel and bellows for the furnace was in place in 1876. Fig. 1 shows the furnace as it appeared in 1892. Fig. 3 is a drawing of the furnace as developed by the excavation, together with the probable arrangement of the missing portions of the furnace, as developed from the existing ruins by several blast furnace experts of today.

As the dirt was removed on the inside at the top of the existing portion of the furnace the walls were found in excellent condition for one-half of the circle, with the original clay wash on the walls still in place. A grey slag was found adhering to the walls and the furnace was filled with dirt to a point below the top of the bosh, where a layer of limestone was found with a friable slag on the walls. Below the limestone was a heavy iron slag containing lumps of stone, and below that a coarse red slag with many pieces of unburned charcoal no doubt dating back to the last time the furnace was blown out more than 100 years before. On the inside of the hearth was a heavy coating of dark green, glass-like, melted slag which had run down the walls as shown in Fig. 3.

On the outside, a considerable excavation was required to uncover the tuyere arch on the side and the tap hole arch at the front. The arch over the tuyere chamber was originally supported on timbers which had rotted and allowed the roof to fall in, while a stone arch was found at the tap opening. In this arch was found an iron plate filler on which the word "new" was distinctly cast—no doubt a plate from the Rebecca of *New* Lisbon. The outer walls are large sandstone blocks nicely fitted and laid, and the inner lining of the bosh is of smaller pieces of red sandstone of more dense and more refractory nature. Probably a mortar of sand and plastic clay was used in laying the blocks. Fig. 2 is a photograph looking down into the hearth from above.

The channel of the diverted stream is now dry but distinct and locates the approximate position of the water wheel for driving the bellows, which wheel was 20 feet diameter. The charcoal pits at the top of the adjacent hillside are clearly located and full of charcoal to a considerable depth. The cast house and stock house foundations are still in place, as shown on the drawing.

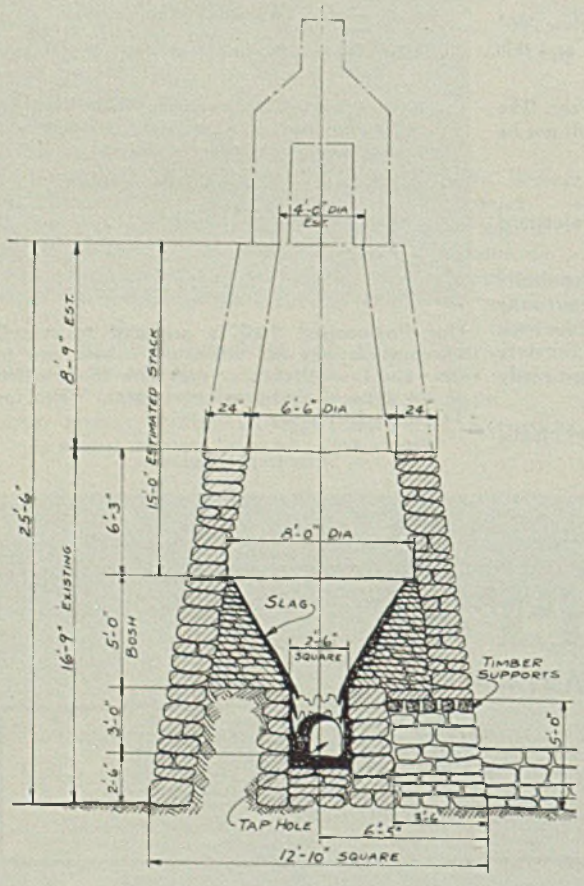


Fig. 3—Section through stack showing the location of timber which was employed for the supporting arch over the tuyere chamber

Operation of Furnace

From the *Ohio Patriot* for 1811 a description of the operation of this furnace was obtained and found to be the usual schedule for these early days. The furnace was in blast for nine months of each year, for which there were two principal reasons. The first was the weather of the winter months which was too cold in these climates for outside work, and the other was that the interior of the lining was destroyed in less than one year, because the outside walls were so heavy that the heat generated could not be relieved. This is in contrast to modern water-cooled furnaces, where a production of 2,500,000 tons of iron in seven years of continuous operation is not unusual.

The practice was to cut wood in the winter in 4-foot lengths for charcoal and pile it in conical piles of 30 or 40 cords. In the early spring these piles, called "meilers" and covered with dirt and leaves, were lighted and burned for about two weeks. Production of charcoal was about 27 to 30 bushels per cord of wood, and approximately 200 bushels of charcoal were required per ton of iron produced.

Kidney ore and limestone were obtained from the surrounding hills for operation of the furnace.

In operation, the cold blast was taken to the tuyere in tin or wooden pipes at a pressure of from ½ to 1 pound per square inch. The melted iron collected behind the hearth dam and was ladled out at intervals of about six hours, in quantities of about 1000 pounds. Cinder ran over the dam and was collected in flat cakes on the stones of the cast house floor. The charge was fed by carrying the charcoal, ore, and stone in boxes and baskets over the runway

to the top of the furnace stack. Blast furnace gas was burned at the top of the furnace in a blue flame which lighted the landscape and was visible for many miles at night.

In the report of David Scott, assistant to the marshal of the district of Ohio, contained in the *Ohio Patriot* in 1811, the capacity of the Rebecca furnace is given as 2 tons of iron per day and the selling price of the iron as $90 per ton, or a sales of about $49,000 per year. The population of Columbiana county at that time was reported as 10,885 in the same report, as compared with the present population of 86,484.

As a comparison with this furnace, the records from the Hopewell furnace in Pennsylvania (STEEL for April 26, 1937) are very interesting.

This furnace was built about 1171 and the record book for 1852 is available. The hearth was 18 x 20 inches and the width of the bosh 6 feet, 5 inches. In 1799 the income from the furnace was reported to be $27,611. The furnace also made 10-plate stoves and employed 168 workmen. Iron sold from $28 to $45 per ton in that district in the time of the Rebecca Furnace and reached a high of $99 per ton during the Civil war.

An analysis of pieces of iron from the Rebecca furnace is carbon 3.54, manganese 0.18, phosphorus 1.23, sulfur 0.117, and silicon 1.32 per cent.

In this analysis amount of sulfur and phosphorus are high for the usual charcoal furnace, but these elements made an iron easy to pour in the thin sections required for fabricating stoves and other Colonial articles.

The authors are indebted to the following persons for their assistance in the preparation of this article: W. E. Rice, bureau of mines, Pittsburgh; A. W. Gittins, general superintendent, and W. A. Steele, blast furnace superintendent, Pittsburgh Crucible Steel Co., Midland, Pa.; E. H. McClelland, technology librarian, Carnegie library, Pittsburgh; W. H. Van Fossan, and C. E. Felton, Lisbon, O.

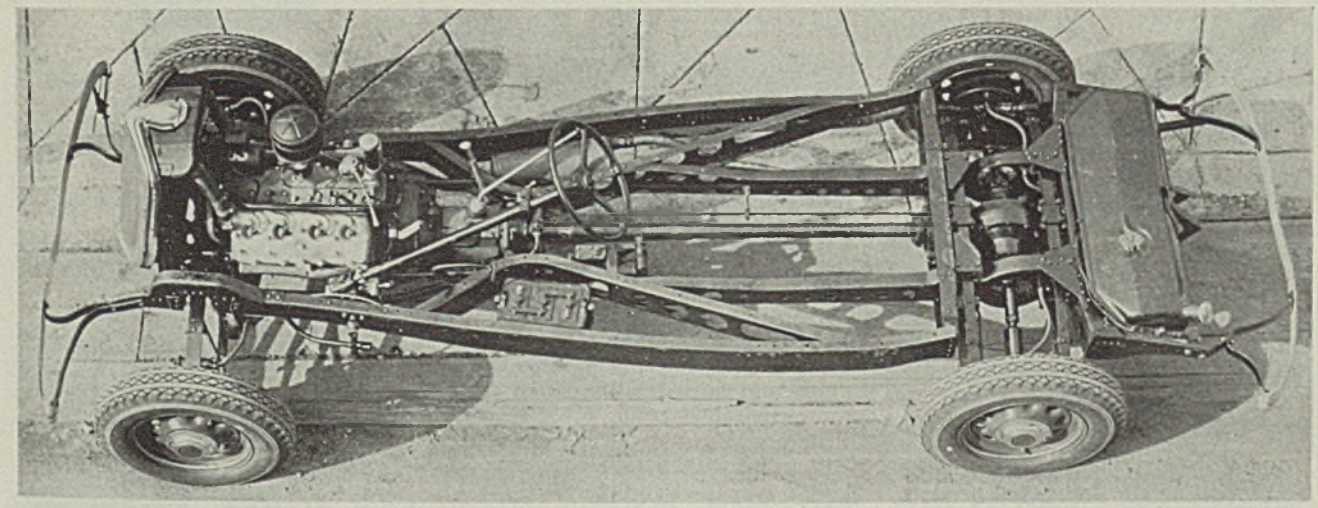
Publication Chronicles Century of Progress

■ Commemorating 100 years of achievement, a recent publication issued by Worthington Pump & Machinery Corp., Harrison, N. J., relates in word pictures some of the significant steps in the growth of this organization. It chronicles the company's activities from its beginning under the guidance of the late Henry R. Worthington in 1840, to its present status as a worldwide enterprise.

New Finishes Suitable For Infra-Red Baking

■ A new line of finishes, Polymerin-100, for use with infra-red baking equipment is announced by Ault & Wiborg Corp., 75 Varick street, New York. It is reported to cure rapidly, providing a hard flexible and durable film. Also available with this line are undercoats, primers and primer surfaces.

New Spring Suspension System Developed



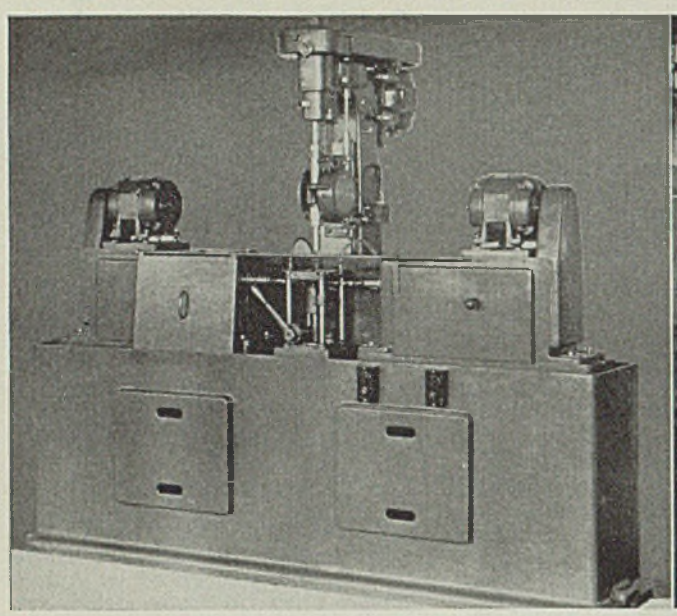
■ CURRENTLY making the rounds of automobile company engineering departments is a new type of wheel suspension, adapted to both front and rear wheels, and embodying sets of four transverse leaf springs supported at the center of the car frame and attached to the wheels through rubber bushings and a special forged steel bracket. The design was worked out by Lundelius & Eccleston, Los Angeles engineers, who have been experimenting with this type of suspension since 1929. Rear suspension comprises two pairs of springs, mounted one above the other and about 12 inches apart laterally. Springs are set with convex side upward, each unit comprising six leaves 2 inches wide. Note car frame has been redesigned to accommodate the suspension and to permit free action of the independently sprung wheels. Universal joints on either side of the differential allow free movement and an uninterrupted flow of power to the wheels.

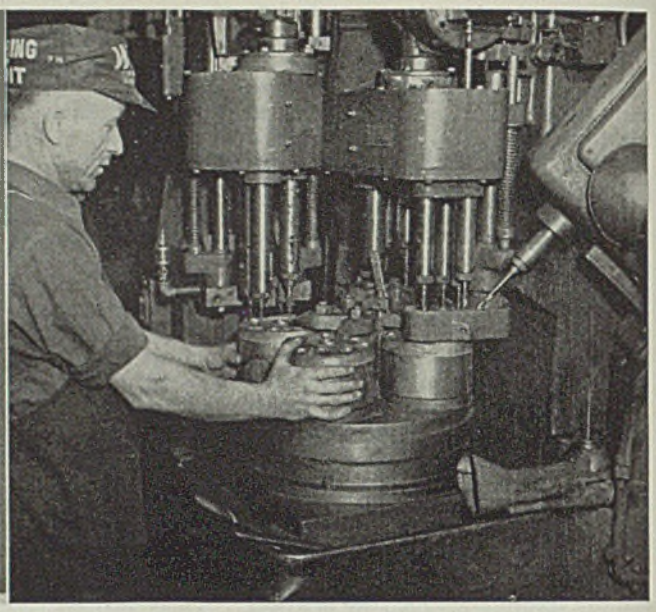
Front suspension system differs slightly from the "four spring parallelogram" design in that only one spring is used on top and two on the bottom, each carrying five leaves. Springs are clamped rigidly top and bottom to steel brackets riveted to the frame and located midway between the side rails.

Recent design improvements aimed toward increasing the length of "free spring" have contributed toward reducing the vibration period of the springs in marked degree, this factor on the rear suspension now being 70 and on the front 72. Conformity of these two rates tends to improve the riding qualities of the car.

Reduction in the number of parts going into the assembly over conventional designs is claimed to make for economical production of the new system. A conventional type automobile with 112-inch wheelbase equipped with the new suspension showed a reduction of 118 pounds in total weight and a reduction of 28 per cent in unsprung weight.

Exceptional roadability, improved safety characteristics, minimum wear on both suspension system and tires, ease of manufacture, ready adaptability to frameless or unit-type body construction are stressed by its designers.





New Machines for Old

By E. J. STONE

Manufacturing Engineer
Westinghouse Electric & Mfg. Co.
East Springfield, Mass.

■ IT IS sometimes necessary to set aside perfectly good machine tools because of changes or obsolescence of parts and products to be manufactured. When this occurs, an attempt is usually made to change or adapt the machine tool for producing some one of the new parts. If that is not practical, the machine is placed on the "available" list to be used or rebuilt for manufacturing some future part. Or if a new machine tool is required because of design changes in the product, maximum production and cost can often be obtained by utilizing integral parts from "available" tools.

Using these principles, the following case example increased production 33 1/3 per cent, raised the new machine's efficiency and saved a $1200 capital investment.

A design change left the machining section equipped with the special 3-spindle drill, left above, on its hands. This unit had been used to drill and counterbore two holes using horizontal spindles, step drills being infed by the cam heads. The vertical spindle fed downward in the same manner to drill ¼-inch hole. This machine had been especially built for this one job and had operated satisfactorily up to the time when the part design was changed. A careful study of the manufacturing schedule showed that no other part could be manufactured to advantage on this drill so it was placed in storage.

Later, as a result of a cost reduction investigation in the plant, it was decided to have a combination drilling and tapping machine built. This machine was to do all the drilling and tapping operations then being performed on an iron casting by the following machines: One single-spindle drill press fitted with a multiple drill head, two 3-spindle drill presses and a single-spindle drill fitted with a tapping head. In addition to the drilling and tapping operations, one station on the new machine was to have a sweep cutter to finish the outside of the central boss on the casting while some of the drilling was being done.

The new machine required a 4-station rotary table drill fitted with hand clamping fixtures at each station as illustrated right above. Loading and unloading are at station one. At station two, two 5/16-inch and two 25/64-inch vertical holes are drilled and also one ⅜-inch oil hole is drilled at an angle and to one half of its final depth. At station three, the two 25/64-inch holes were counterbored to a depth of about ¼-inch, the ⅜-inch oil hole is finish drilled to depth and a form cutter sweeps off the central boss to its final size and contour. At station four, the spindle is fitted with a tapping head where two ¼—20 and two ¾—16 holes are tapped. All vertical holes and the sweeping off of the hub are done with one spindle fitted with a 7-spindle multiple drill head.

In discussing the design of the drill, it was suggested that part of the 3-spindle machine in storage might be used in the new machine. The idea proved sound so the drill manufacturer was consulted. His designer agreed that the two horizontal heads, when overhauled and fitted with new cams, would be perfectly satisfactory for drilling the angular oil hole. One head is set up to drill half the hole depth and the second head finishes the job.

As a result, the output of the machine was increased about one-third over the estimate made on the first design. In addition to $1200 being saved on the cost, a more efficient drill than contemplated was obtained. Above this, an unexpected reduction in the piece cost of parts produced on the machine is made.

The particular case illustrates what may be accomplished by reviewing the available tools in storage in a plant and giving them careful consideration when the purchase of a new machine is contemplated. Many times the changing of the fixture setup, the addition or elimination of a cutter head or spindle, or even the relocation of any one of these will furnish the manufacturer with a tool eminently satisfactory for his purpose.

OPPORTUNITIES TO WIDEN PROFIT MARGINS

HOW AUTOMOBILE MANUFACTURERS LOWER UNIT COST OF MANUFACTURING

UNIT type machines, as seen across the bottom of this advertisement, have a wide application for boring, drilling, tapping, and kindred operations on automobile components. These machines avoid a hurried obsolescence in a fast changing industry because they are built from standard units which are easily readjusted to meet design changes in automobile parts. You can accommodate future design changes with only tool head and fixture purchases. Amortize these faster than a complete machine, making it easier to get your equipment appropriation.

W. F. & JOHN BARNES CO. • ROCKFORD, ILLINOIS

SAVED 35 DAYS Per Week

A MANUFACTURER of tools used in oil drilling was obtaining eight complete parts per eight hour day. After installation of a Barnes unit type machine, he secures eight complete parts every hour—280 more parts per week.

The machine is semi-automatic—performs drilling, facing, hollow milling, and tapping operations simultaneously. It accommodates 19 different parts.

Write for our booklet "Since 1872 . . ." to see how machines of this type are serving other industries.

W. F. & JOHN BARNES CO.
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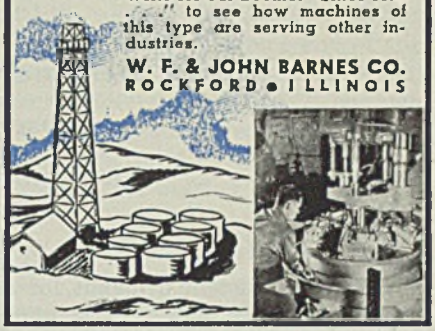

HIGH SPEED RIFLE BARREL REAMING

OVER one hundred rifle barrels reamed every hour. The machine accommodates barrels ranging from 22 to 50 caliber. In addition, drilling, chambering and crowning machines can be furnished.

Write for our "Rifle" folder.

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To Profit More Sell It for Less

This machine bores, counterbores, faces, drills and taps seven holes in washing machine parts — total time 60 seconds each. It's one of seven of our machines in daily operation for this progressive manufacturer. Why? Product cost and price are lowered, opening wider markets, and establishing a higher profit margin.

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How Can Airplane Production Be Increased?

PRESENT demands in airplane manufacturing necessitate the use of *special* machine tools. Two Barnes unit-type production machines recently furnished for airplane engine parts are shown to the left. These are significant of the inevitable trend towards high production methods in aircraft manufacturing. Our "Aircraft" booklet illustrates several outstanding machines designed and built for a "straight in line" engine — write for your copy.

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WANTED

Men interested in seeing the flexibility in application of unit type machine tools, to write for our booklet "Since 1872 . . .".

W. F. & JOHN BARNES CO., ROCKFORD, ILL.

35% SAVINGS

TEN YEARS of continuous operations of drill, counterbore, face and hollow mill is the record of this one installation. Over 4,000,000 pencil sharpener bases have been machined—the original savings was 35%.

Many other manufacturers are saving on unit costs with unit type special machine tools. You'll see some of these in our booklet "Since 1872 . ." —a copy of which will be mailed upon request.

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TO SHORTEN A FARMER'S DAY

OF all the modern implements used by farmers, the tractor is perhaps the most useful in saving time and labor. Most tractor manufacturers in this country have one or more Barnes unit type machines for lowering manufacturing costs — thereby making tractors available to more farmers.

Your product may not be tractors, but you can probably expand your market by lowering manufacturing costs. Unit type special machine tools will help you do this. Write for our booklet "Since 1872 . . .".

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HOW TO BUILD YOUR OWN PRODUCTION MACHINE TOOLS

You can mount these hydraulic, self-contained units on new, or existing machine beds—at any required angle. Available in sizes from one to thirty horsepower for drilling, boring, milling, etc. Design your own fixture and spindle head and apply these units for a profit making machine tool. Write for our "SH-75" folder.

W. F. & JOHN BARNES CO., ROCKFORD, ILL.

YOUR SAVINGS BEGIN BEFORE DELIVERY

THIS MACHINE both bores and hones. Yet, costs but little more than one designed for only one of these operations. Consequently, the investment required for a complete machine is saved with your initial purchase. Subsequent savings will be realized in its ability to handle a wide range of cylinder bores and lengths. The illustrations show the varied work for which this machine is used. Long and short bores are both bored and honed. To combine these two operations so that each can be done accurately and quickly on one machine required several new design features. These are described in our "Horizontal Boring and Honing" booklet which will be sent to you upon request.

W. F. & JOHN BARNES CO.
ROCKFORD • ILLINOIS

By FRED B. JACOBS

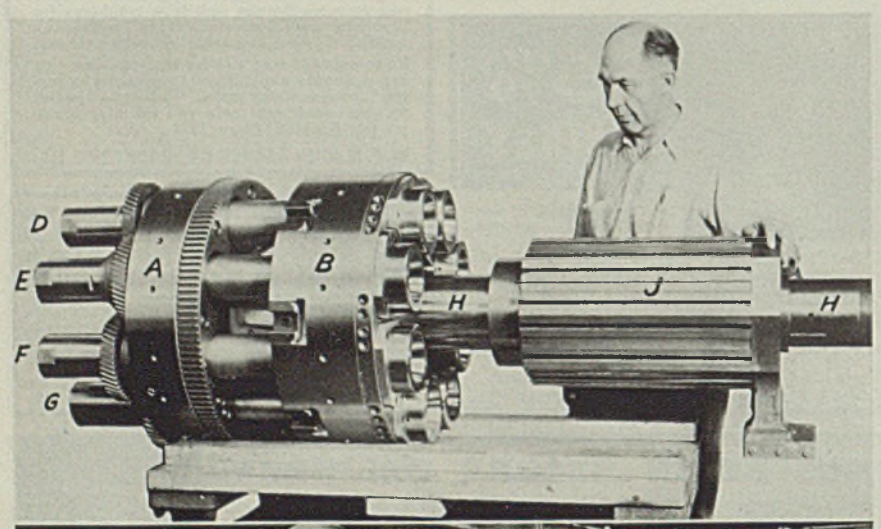
Assembling Machine Tools

Demands for more precise work from machine tools has resulted in closer tolerances in fitting parts, in turn dictating finer and more delicate assembly operations and production testing

■ DUE TO insistent demands for accuracy and more accuracy in the output of machine tools of all descriptions, machine-tool builders have met the issue by paying great attention to the built-in accuracy of their products—and quite logically, for no machine tool can produce precise work if it lacks a high degree of precision itself.

In such work, the most modern machine tools, precision gages and the free use of special jigs and fixtures are essential. To make the various components is one thing; to assemble these components to make an accurate machine tool is quite another matter, one calling for a still higher degree of skill.

At the plant of the National Acme Co., Cleveland, manufacturer of multiple-spindle automatic bar-stock screw and chucking machines, generally termed "automatics," assembly operations have been highly systematized so the work passes down the assembly lines with no backtracking. This is necessary inasmuch as over 100 machines may be on the floor in various stages of assembly at one time.



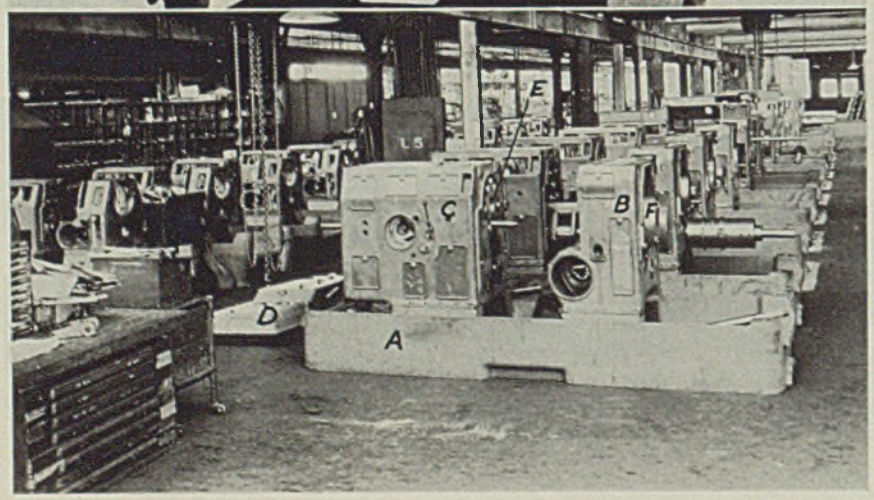


Fig. 1. (Upper)—Spindles assembled in the spindle carrier. The integral spindle carrier stem carries the end-tool slide. Fig. 2. (Lower)—Part of the frame assembly line. Here the various frame members are put in place and accurately aligned before the machines go to the final assembly

This company operates one of the largest machine-tool manufacturing plants on one floor in the world where over 30,000 automatic machines have been produced and sold. . . . Consider assembly of the new Acme-Gridley multiple-spindle automatic bar machines built in three styles and 15 sizes:

Assembling operations can be divided into two classes, subassemblies and main assemblies. As many units as possible are put together as subassemblies to expedite work on the main assembly floor. An important subassembly is that of the spindle carrier shown in Fig. 1. Here A and B are the two spindle carrier bearings on which

the entire unit is rotated by means of a gear. The spindles at D, E, F, G are rotated by helical gears powered from a master gear on the main spindle drive shaft which passes entirely through the spindle carrier and its integral stem shown at H. The end-tool slide J, carried on this stem, is steel with its locating surfaces for toolholders accurately finished by grinding.

Since the end-tool slide moves along the carrier stem on large bearing surfaces, it is evident that permanent alignment is assured between the end-tool slide and the spindle carrier. As will be explained later, the holes in the end-tool holders on this end-tool slide are bored during assembly, assuring exact alignment. Spindle carriers and their spindles are assembled in a separate department called the "white house." All interior walls of this room are painted white to reflect as much light as possible and dust and dirt is carefully excluded.

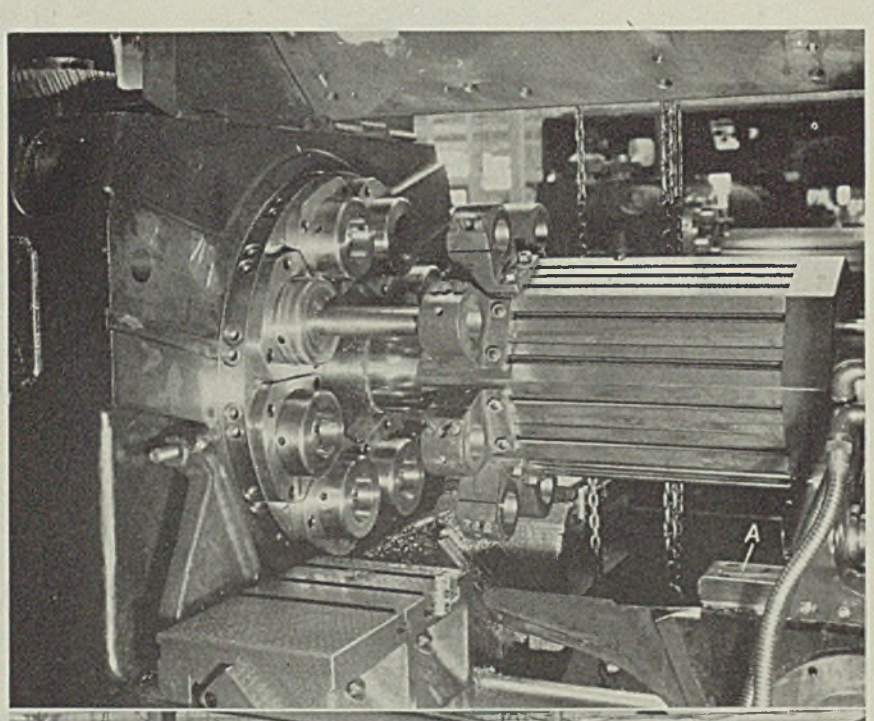
Other important subassemblies include the cross tool slides; oil pumps; various drilling, reaming and tapping attachments; spools containing the finger holding mechanism for collet operation; etc. Machinists in the subassembly department have individual benches. This type of assembly work calls for a high degree of skill as it consists of fitting various parts together. As the metal scraping involved is an art in itself, this is performed by men who devote their entire time to this work. A certain amount of grinder, shaper and lathe work must also be performed by the assemblers when putting various units together. However, the amount of this actual machining work is negligible when compared with that necessary several years ago, before the plant was fully equipped with jigs and special tools.

Subassembly work is thoroughly systematized so no time is lost in locating the various items. Parts are drawn from the stock room and taken to the subassembly department in steel tote boxes. When an assembler is given a certain job, he first counts the parts and checks them with the stock list, assisted by the assembly department clerk. Any missing parts are obtained immediately from the stock room.

The floor here is of wood block. Not only is this a comfortable floor to work upon, but finished parts are not marred if dropped accidently. In some cases subassemblies go back into stock to be drawn out against future orders. Usually, however, they go directly to the main assembling floor.

In discussing main assembly problems, it should be remembered that an Acme-Gridley automatic consists of four main essentials—the combination pan and base, the headstock section, the gearbox section and the top section. Also, at the extreme end of the pan unit, next to the headstock section, is mounted the stock-reel bracket. Referring to Fig. 2, the pan unit is shown at A, the headstock section at B, the gearbox section at C and the top section lying on the floor at D. The stock-reel bracket is shown at A, Fig. 4.

(*Please turn to Page* 73)



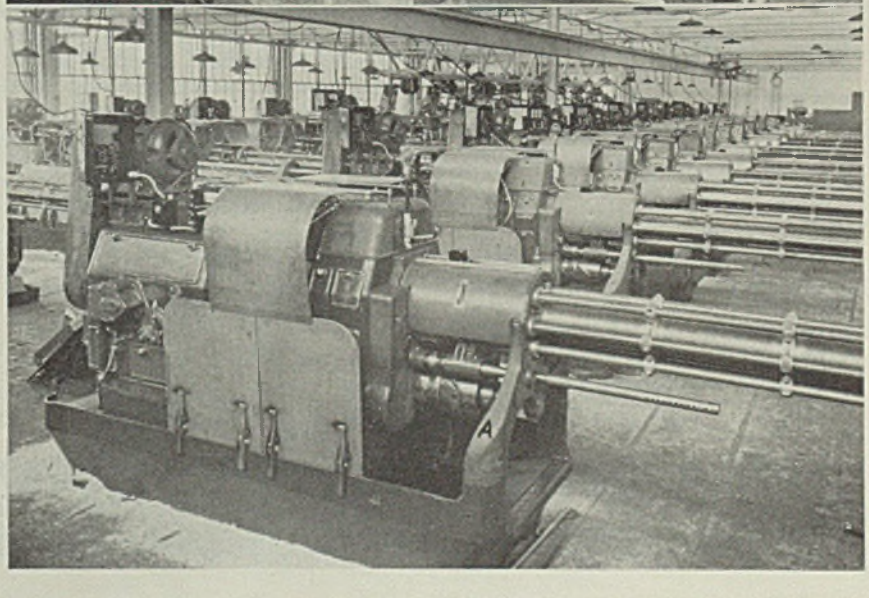


Fig. 3. (Upper)—Tool holders must be bored while in place on the tool slide. This is done from the work spindles after the tool holders have been accurately aligned with vital surfaces of the end-tool slide and cross slides, thus assuring exact axial alignment. Fig. 4. (Lower)—In this line the machines are tooled up and given a final running test on parts actually to be placed in production

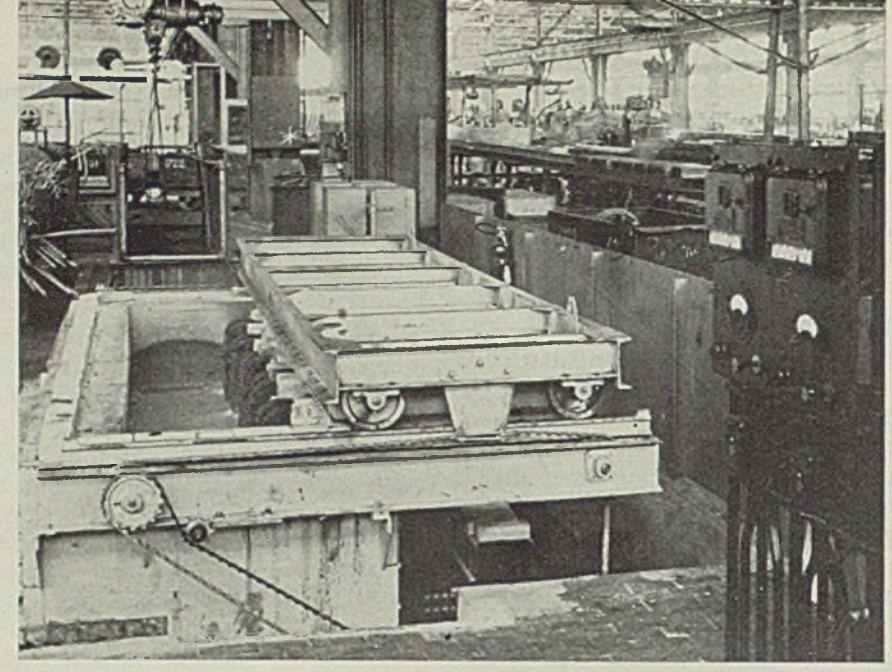


Fig. 1—This electrically - heated salt bath for heat treating precipitation copper-base alloys consists of a refractory pot, six pairs of electrodes, the bath proper, and a monorail hoist for immersing the work

Electric Salt Bath

Resistance heated liquid medium proves efficient in performing solution treatments on precipitation hardening copper-base alloys. Close temperature control and uniform heating improves product

By W. F. AYLARD
Fuel Engineer
and
E. J. DUNN
Process Metallurgist
Cleveland Division
Chase Brass & Copper Co. Inc.

■ INDUSTRY'S demands for specialized equipment have led to the development of many varieties of heat treating furnaces. Among the more recent is the resistance heated bath, so-called because the liquid bath is heated by its own resistance to an electrical current. It is this type of unit which the Cleveland plant of Chase Brass & Copper Co. Inc. is operating to perform the metallurgical heat treatments described more fully in the latter part of this discussion. Briefly, the unit is employed in solution treating copper alloy rods and slabs at temperatures ranging from 1650 to 1850 degrees Fahr. for varying time cycles depending upon the application.

The resistance heated bath consists of several major component parts; namely, a tank to hold the liquid bath, the bath itself, electrodes suitable to form an electrical circuit through a definite quantity of the molten bath, a suitable source of electrical energy, and a mechanism for immersing the work to be heat treated. A brief discussion of each of these items is necessary for a general understanding of this particular heating unit.

The installation is shown in Fig. 1. Internal dimensions of the rectangular tank are a length of 12½ feet, a width of 2½ feet, and a depth of 1½ feet. The inside lining consists of 6-inch thickness of rammed refractory material. Backing up this lining is a 6-inch thickness of poured insulating refractory. This composite 12-inch thick tank is set on a concrete base and is supported on the sides and ends by boiler plate panels suitably braced and supported by angle iron. To minimize radiation losses, a motor-driven cover is provided which can be rolled open or closed at will. After five months service and several shutdowns, the refractory tank is still in good condition.

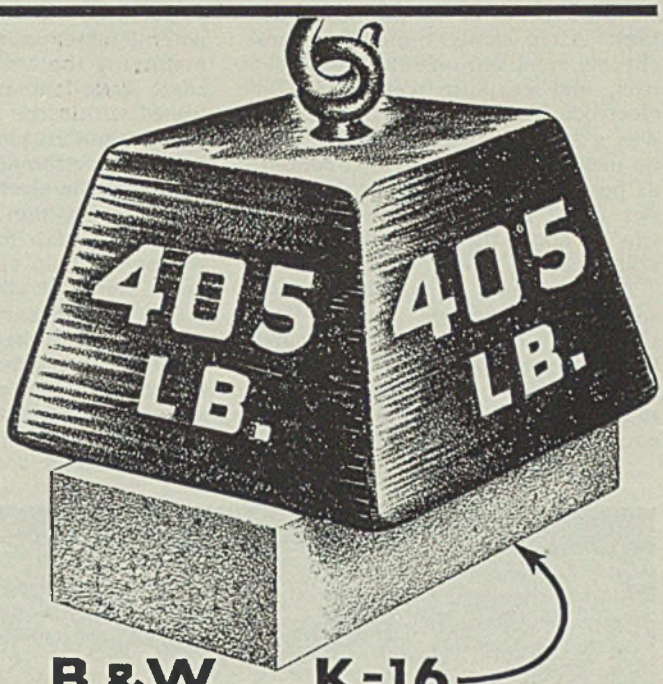
The bath being used at present was prepared by a prominent salt company and consists chiefly of chloride salts. Some of the considerations in the choice of the bath were: Suitable electrical characteristics; minimum of corrosive attack on electrodes, refractory tank, copper alloys to be heat treated, and the handling mechanism; minimum of loss due to volatilization at the higher operating temperatures; suitable melting point and fluidity at operating temperatures; and resistance to contamination and subsequent changing of properties.

A large number of various mixtures of salts were investigated before a satisfactory combination was obtained. It was found necessary to provide a blanket of graphite about ⅛-inch thick to cover the exposed top area of the molten salt. This cover greatly reduces the radiant heat losses and practically eliminates fuming.

Cast alloy steel electrodes, 2 inches square in cross-section, are immersed vertically in the salt in pairs. The spacing of the electrodes in each pair and the depth of immersion determine the amperage for any given temperature.

In this particular application there are six pairs of electrodes arranged in two zones of three pairs each and located at equal intervals along one side of the tank about 2 inches away from the refractory lining. The electrodes are immersed to a depth of about 10 inches and extend down to

B&W K-16
A FIRED-CLAY REFRACTORY
with MAXIMUM



Load-Bearing Capacity at Operating Temperatures

It is commonly believed that cold-crushing strength and weight are indicative of load-bearing capacity in an insulating firebrick when subjected to operating temperatures. Carefully conducted tests show that this is not true. The best indication of physical strength is the lack of deformation under a given load at service temperatures.

B&W K-16 Insulating Firebrick, although weighing only 1.1 lb. per 9-inch straight, show no deformation whatever at 1600 F under a load representing the weight of an 80-foot unsupported wall.

The same load at 1600 F caused various degrees of deformation in competitive insulating brick that weigh as much as 58 per cent more than K-16's.

The principal reason for the superiority of B&W K-16's is that they are a fired refractory, made from Georgia kaolin by an exclusive process.

Write for Bulletin R-18, containing engineering data regarding B&W K-16's.

R-107

THE BABCOCK & WILCOX COMPANY
REFRACTORIES DIVISION: 85 LIBERTY ST., NEW YORK, N. Y.

BABCOCK & WILCOX

within 2 inches of the bottom of the tank. After straight nickel, nickel-chrome steel, chrome steel, wrought iron, and graphite were tried for electrode materials, the final choice was a 28 per cent chrome steel with no nickel and as low carbon content as possible, preferably less than 0.15 per cent. These electrodes have a life of about three months at constant service in the molten salt.

Electric power is supplied to each separately controlled zone of electrodes by a 125-kilowatt transformer in voltage steps across the electrodes ranging from 8 to 19 volts. A maximum of 250 amperes is available on each phase of the transformer primary at 440 volts. An indicating potentiometer controller accurately maintains the temperature of each zone. Excellent uniformity is obtained within the bath because of a very violent stirring action produced by the electromagnetic forces generated at the electrodes.

The production which is mainly in rod and slab form is handled by means of chain slings and an overhead monorail electric hoist.

Starting the salt bath is relatively simple. Since the salt in the solid state is practically nonconductive to electrical energy, a small pool of the salt must be melted by carbon arc or gas-air torch at each pair of electrodes to start the flow of current. A unit of the size described will then melt down its salt by resistance to the current in about 24 hours.

A unit of this type has a relatively high operating cost which is justified by certain important metallurgical advantages. A large proportion of the work heat treated in this furnace comprise precipitation hardening copper-base alloys. Briefly, the solution treatment consists of heating as rapidly as possible to the required temperature and then quenching in cold water. A subsequent aging treatment at a relatively low temperature in a gas-fired convection oven causes precipitation, increasing the hardness and electrical conductivity.

Oxidation Is Detrimental

When the aforementioned solution is carried out on certain alloys at temperatures ranging from 1700 to 1825 degrees Fahr. in ordinary oil or gas-fired furnaces, an undesirable surface reaction takes place. The metal is very heavily oxidized on the surface, forming two definite layers. The outer layer consists of copper oxide scale which is removed in the quenching operation and merely results in a small metal loss. The inner layer is of a much more serious nature since it is not easily removed and since it affects markedly the physical properties of the material. In this inner layer or subscale, the alloying element is preferentially oxidized, with the result that this layer of metal will not respond properly to the aging treatment.

If the same metal is heated to the same degree in the salt bath, there is no outer copper oxide layer and the thickness of the preferentially oxidized alloy layer is markedly reduced. This is shown by the photomicrographs, Figs. 2, 3 and 4. The structure of the original material is shown in Fig. 2. A similar section through the sample given the solution treatment in a typical gas-fired furnace is shown in Fig. 3, while the structure of a cross-section of a similar piece given the treatment in the

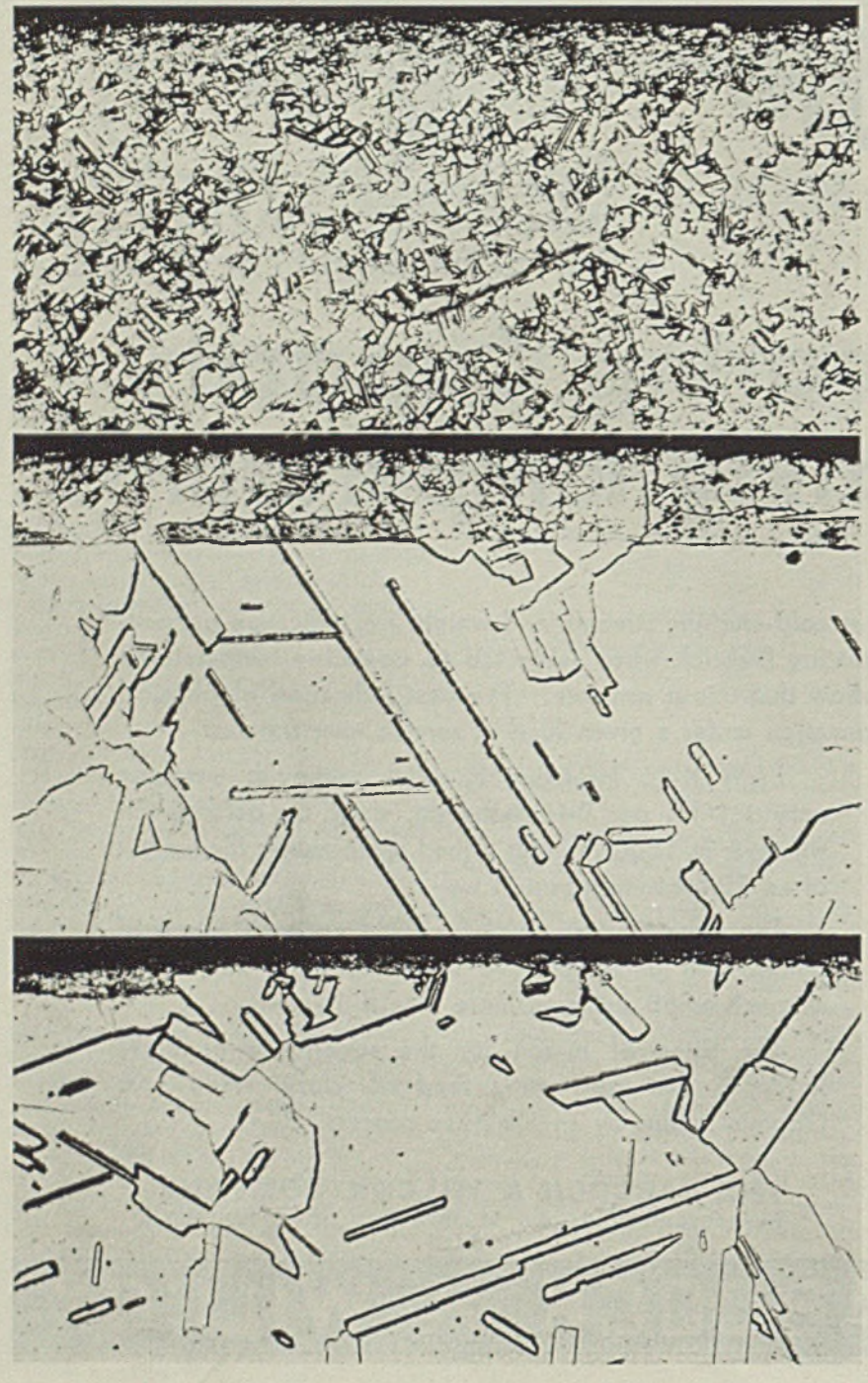


Fig 2. (Top)—Photomicrograph of copper-alloy rod before solution treatment. Annealed at 1250 degrees Fahr. and drawn. X100. Edge of rod is shown at top. Fig. 3. (Center)—Photomicrograph of copper-alloy rod after solution treatment by heating in oxidizing atmosphere for 20 minutes at 1800 degrees Fahr. and water quenched. X100. Edge of rod is shown at top. Fig 4. (Bottom)—Photomicrograph of copper alloy rod after solution treatment by heating in salt bath for 20 minutes at 1800 degrees Fahr. and water quenched. X100. Edge of rod is shown at top

salt bath furnace is shown in Fig. 4. A comparison of Figs. 3 and 4 shows that the oxidized layer of the salt bath treated metal is only about one-fifth as thick as that on the material given the treatment in the gas-fired furnace.

The salt is very nearly neutral in its action on the metal and also forms a protective coating for the surface when it is exposed to the air during the quenching operation. This results in a much smoother and more easily cleaned outside surface, with no tendency to scratch during the following cold drawing operation.

Another most important advantage of the salt bath is uniformity of temperature throughout and ease and accuracy of obtaining excellent temperature control. The violent stirring action caused by the electrodes and direct nature of the applied heat are responsible. A much more uniformly processed material is obtained and in cases where temperatures extremely close to the melting point are necessary, they can be reached without the danger of overheating encountered in fuel-fired furnaces.

Another important advantage is the extremely rapid rate of heating accomplished in the salt bath. In many cases better control of grain size is obtained.

Experience seems to indicate that a salt bath installation offers advantages where accurately controlled uniform temperature is desired at high temperature ranges and where the salt protection and rapid heating rate are beneficial to the product.

The unit described in this article is of the Ajax-Hultgren type and was installed by the Ajax Electric Co., Philadelphia. Electro Refractories & Alloys Corp., Buffalo, and Midwest Refractories Co., Pittsburgh, developed the pot; and A. F. Holden Co., New Haven, Conn., the salt mixture.

Machine Tools

(*Concluded from Page* 69)

Various holes in the headstock and gearbox sections are bored accurately in special jigs to assure the correct relation of all holes in each unit, and interchangeability of the units.

In the frame assembly, it is necessary to align the headstock and gearbox sections as nearly perfect as possible. As a matter of fact, this alignment must show no error greater than 0.0003-inch. Considering that one of these machines is from 7 to 13 feet long without the stock reel and weighs from 5 to 15 tons, this close alignment is little short of marvelous.

In Fig. 2, center hole E in the gearbox section must align with the center hole F in the headstock. The alignment must be vertical as well as horizontal and axial. It is done by special aligning tools and dial indicators. After the parts are aligned as accurately as is possible, the headstock and gear box sections are doweled in place for permanent accuracy. Such highly accurate frame assembly work is of utmost importance and requires men of long experience and extreme patience.

After the box type frame is assembled, aligned and tested for accuracy, actual assembly of the machine begins. The spindle carrier shown in Fig. 1 is put in place, together with the end-tool slide J, Fig. 1. Next the spindle drive shaft is inserted through both gearbox section and spindle carrier. Then there is the main drum shaft which runs through the entire machine base, and which carries cams for operating threading slides; the cam drum for actuating the high-speed clutch, threading clutch and brake; end-tool slide drums; sliding stock feed stop drum; indexing arm for spindle carrier; indexing gear for spindle carrier; chucking drum; and chucking slide and stock feeding drum.

There also are the lower side slide cam drums which are carried on a shaft running at right angles to the main drum shaft. Many cam drums and cam plates must be timed accurately after the shaft is in place. Since the lower index gear for the spindle carrier is actuated by an improved Geneva mechanism actuated by the indexing arm carrier, it must be timed before it is permanently fastened in place. The guide shown at A, Fig. 3, must be aligned accurately as it supports a bracket on the end of the end-tool slide. Many timing and aligning operations thus are involved in the assembly.

Boring holes in the end-tool holders, Fig. 3 is performed at assembly. These holes must align exactly with the spindles, otherwise accuracy could not be attained in operation. Precision grinding the end-tool slide finishes it precisely and assures that the various surfaces are in correct relation with each other. Bottoms of the end-tool holders are first scraped to full bearing surface on the slide. Then they are bolted in place and bored in working location with a single-point tool as shown in Fig. 3.

At this point one may ask what means are taken to make sure that the spindles themselves are in an exact circular location and with correct chordal distance between them. Holes for the spindles in the spindle carrier are diamond bored, during which operation they are indexed by an extraordinarily large index plate. After the spindles are in place in the spindle carrier and the spindle carrier located in the machine, stock is gripped in each spindle chuck and these test pieces are turned with a single-point tool mounted on the tool slide. Thus any inaccuracy is promptly detected and remedied.

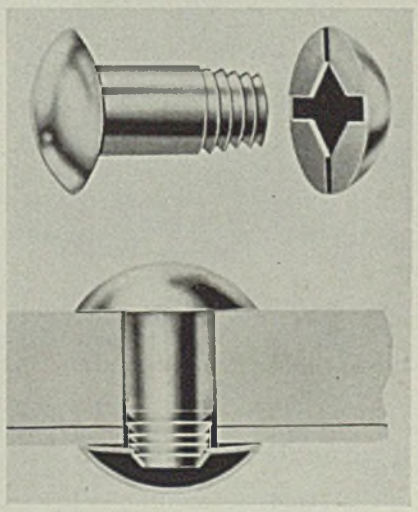
In the finished assemly line, the machines are fitted with tool slides, lubricating systems and various other components, this work being done by machinists of long experience as it calls for special skill. After final assembly, machines are tooled up and given a real production run, actually making parts. This final test is of the utmost importance and is carried out with painstaking thoroughness, inasmuch as upon it depends whether or not the machine will function properly after it is delivered. After this final test, machines are cleaned thoroughly, painted and boxed for shipment.

♦

New Fastener Designed To Withstand Vibration

■ Hopkan Rivet Co., 128 Latham street, Pittsburgh, announces a new fastener and spring locking button designed so it will not loosen from vibration when assembled. Besides ordinary uses, it is especially suitable for automotive, aircraft and refrigerator assembly.

The fastener stud consists of a head and shank, the latter being tapered toward the end and provided



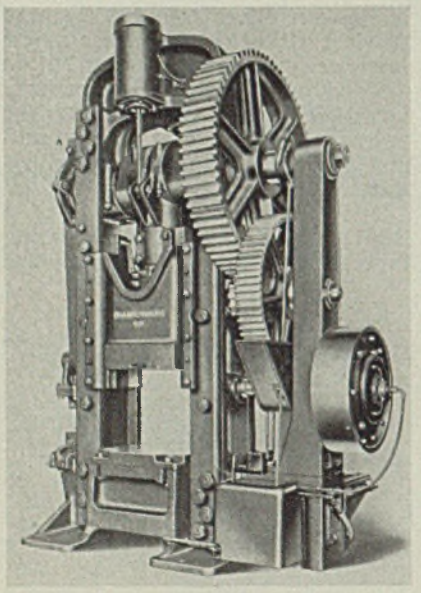
Elements of the new fastener

with a number of parallel grooves. The spring locking button snaps over the tapered grooved end of the shank and has segments which extend inwardly to lock the fastener button on the stud. A special tool compresses the spring locking button onto the stud.

Trimming Presses

■ Chambersburg Engineering Co., Chambersburg, Pa., has developed a line of double geared steel side trimming presses in capacities up to 1000 tons. Sizes of 150 tons and over are all equipped with an improved type pneumatically operated clutch.

All of the presses are of forged steel side frame construction, and include such features as oversize crank, use of outboard bearings on



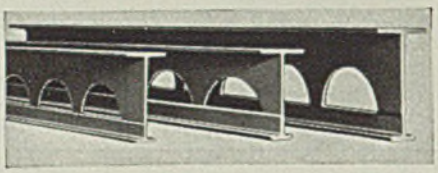
all shafts, reinforced Pitman, extra large Pitman pin and gears cut from solid steel.

Tramrail Arch Beam

■ Cleveland Tramrail division, Cleveland Crane & Engineering Co., Wickliffe, O., announces a new series of tramrail arch beam for overhead materials handling systems taking loads up to 5 tons. It includes three different sizes of arch beam consisting of the No. 3000 which has a depth of 12 inches and weight of 28 pounds per foot, No. 3100 which has a depth of 12 inches and weight of 33 pounds per foot and No. 3200 which has a depth of 15 inches and weight of 50 pounds per foot.

The arch beam is in the form of a compound section consisting of a wide flanged T-member to which is welded a rolled rail. The vertical members of this T-section is arched at regular intervals, reducing the weight to a minimum without sacrificing strength.

Feature of wide top flange is it prevents buckling of beam even when used for very long spans and with heavy loads. The rail has a hard, flat raised tread or running surface. This prevents the rail flanges from peining down. Rails for 5-ton systems have an overall width of 3¼ inches, a lower flange thickness of ⅝-inch and wearing



strips measuring ⅝-inch wide by ⅛-inch thick.

The arch beam is supported by a ball and socket swivel connection both at the ceiling and at the top of beam flange.

Small Welder

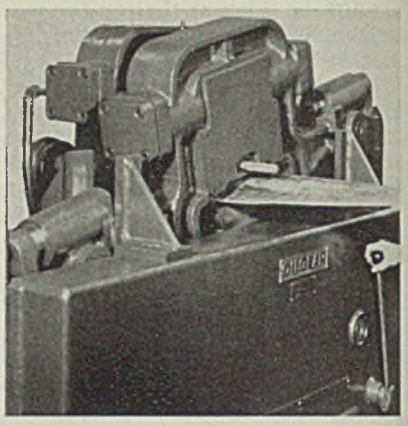
■ Harnischfeger Corp., 4411 West National avenue, Milwaukee, announces a new small WD-150 welder which is less than 33 inches in length and one foot in height, but delivers uniform welding currents ranging from 200 down to 15 amperes. Its current selection is simplified by a single control.

Square frame design of the unit permits a better arrangement of coils, etc., which in turn provides greater cooling areas. The welder is available with stationary or portable mountings.

Propeller Twister

■ Oilgear Co., 1301 West Bruce street, Milwaukee, announces a new fluid power variable speed propeller twisting machine for twisting 7 to 14-inch airplane blades in order to correct inaccuracies in pitch. It permits blades to be forged nearly to the finished size. Outstanding features of the machine include simple push button control of the fluid power clamps in the stationary and twisting supports, hand lever, pilot follow-up control of speed and direction of twisting support movements, a 2-way variable displacement radial piston fluid power pump and stationary and twisting clamp supports with integral clamping and unclamping cylinders.

The propeller blade is loaded from

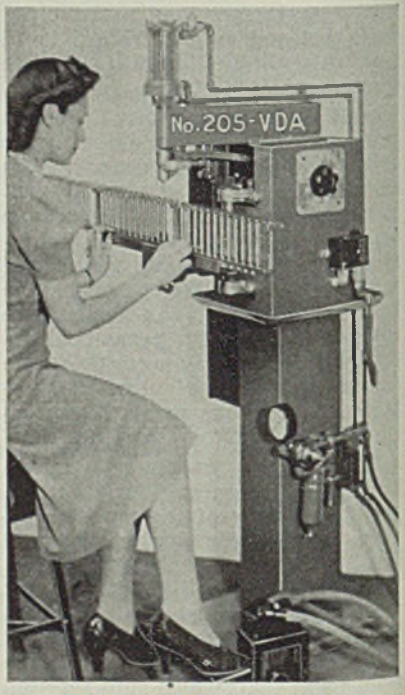


the back of the machine and threaded through the stationary and twister clamp to the point to be twisted.

The normal torque of the machine is 530,000 inch pounds. Twister movement is 24 degrees, 12 degrees on either side. The steel welded frame which supports pump, motor, cylinders etc., contains an oil reservoir and encloses the operating mechanism. The unit takes up a floor space of 29 x 81 inches.

Spot Welder

■ Eisler Engineering Co., Newark, N. J., has introduced a 5 kilovolt-ampere high speed spot welder. It is an air operated, vertical press type machine supplied with an au-



tomatic timer and contactor. Two operators are required for this wel-

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1. Finished Metal Parts

Townsend Co.—6-page illustrated bulletin describes rolled, stamped and formed parts such as screws, nails, bolts, rivets, hooks and pins. Actual size illustrations of 199 different metal "gadgets" are shown. It is stated that these products and other similar parts are available in any size, of any metal for almost every purpose.

2. Bolts, Nuts, and Rivets

Bethlehem Steel Co.—98-page illustrated spiral-bound handbook No. 153 contains complete specifications and descriptions of bolts, nuts, rivets, spikes, turnbuckles, clevises, washers, cap screws and special products. List prices of all parts are included in this indexed data book.

3. Sleeve Bearing Data

Johnson Bronze Co.—Three illustrated data sheets dealing with "Ledaloyl", a self-lubricating sintered bearing. Method of installation, operating temperature, contraction and expansion, chemical and physical characteristics are some of the data included in this series.

4. Stainless Steel

Republic Steel Corp.—24-page illustrated bulletin No. 363 presents engineering information, physical properties and application data in chart and tabular form on "Enduro" stainless steel in types AA, AA-FM, S-1, and S-2. Working instructions for various types are given.

5. Brass Fittings

Pittsburgh Brass Manufacturing Co.—40-page illustrated catalog No. 3 is descriptive of line of cocks, hose couplings, elbows, fittings, swing joints, plugs and swing unions for industrial application. Specifications and prices on these and bronze fittings and specialties for blast furnace, steel mill, chemical and process plants are given.

6. Strain Gage

Baldwin Southwark, Div. of Baldwin Locomotive Works—12-page illustrated bulletin No. 155 describes SR-4 bonded metalectric strain gages for determining stresses in structures. Presents complete instructions on application and use of instrument for static, dynamic and semi-dynamic strain measurements.

7. Special Iron

Joseph T. Ryerson & Son, Inc.—4-page illustrated bulletin on "Lewis Iron" describes special staybolt iron, solid staybolts, different types of "Lewis" engine bolt iron and U. S. Navy Chain iron. Applications, physical properties, sizes and shapes available, and other pertinent data is explained.

8. Steel Stamps

M. E. Cunningham Co.—4-page illustrated bulletin, "Safeguard with Safety Wedge Grip Stamps and Holders", describes steel stamps, wedge grip holder, sledge type holder, axe type holder, radius holder, steel letters and figures, tube and plate marker and inspection hammers for marking almost all types of products and materials.

9. Bearings

Bantam Bearing Corp.—24-page illustrated bulletin No. 104 contains design, application and engineering data on "Bantam" needle, ball thrust, and roller thrust bearings, quill rollers, and cam followers. Dimensions, prices and descriptions are included.

10. Low Head Hoists

American Engineering Co.—28-page illustrated catalog No. H-10 is indexed for ready reference and includes details of "Lo-Hed" hoists for all types of materials handling applications. Details of construction, features, dimensions and engineering data on these units with capacities of ¼ to 12 tons are given.

11. Battery Truck System

Electric Storage Battery Co.—4-page illustrated bulletin No. 4100 describes the "Exide System" for better material handling. System includes means of determining size of battery needed in industrial truck for best performance, a discharge indicator for determining when truck batteries should be charged, and a charging system that requires no supervision.

12. Spray Equipment

Eclipse Air Brush Co.—32-page illustrated catalog No. 77 describes complete line of spray equipment for manual and automatic operation. Included is a section devoted to "Pneumix" air-motor agitators.

13. Resistance Welding

General Electric Co.—4-page illustrated bulletin No. GEA-3337 announces a new method for reducing the kilovolt-ampere demand of resistance-welding machines. Described is capacitor equipment for improving power factor for this type of welding installation.

14. Steam-Jet Electors

Worthington Pump & Machinery Corp.—6-page illustrated bulletin No. W-205-B7 presents complete design, application and operating details of two-stage condensing type steam-jet ejectors for the production of vacuum in industrial processes. Operating cycle of this unit is explained.

15. Roller Chains

Whitney Chain & Manufacturing Co.—72-page illustrated catalog No. V-145 covers roller chains and sprockets. Included in this informative handbook are selection and design data, horsepower tables, and engineering information on power transmission equipment such as chains, sprockets, flexible couplings and chain drives.

16. Boring and Honing

W. F. & John Barnes Co.—4-page illustrated bulletin, "Designed for Boring and Honing", describes a combination machine which can be changed over in 20 minutes from a boring to a honing machine, or vice versa. Cylinder bores can be finished to any degree of finish and accuracy required with this unit.

17. Lathes

R. K. LeBlond Machine Tool Co.—48-page 3-color spiral-bound illustrated publication, "March of the Masters", describes "Regal" and "Super Regal" line of lathes in sizes ranging from 10 to 24 inches. Full specifications, details of construction and mechanism of lathes as well as description of special tools are included.

18. Electric Welding

Lincoln Electric Co.—Application sheet No. 68. Economics of welding as effected by electrode selection is covered in a practical manner. An example of calculation of welding production costs for a butt joint, single V-groove with backup plate in overhead position is shown.

19. Abrasives

Norton Co.—4-page illustrated bulletin, "Research—Another Phase of Norton Service," includes an interview with the director of Norton research laboratories which explains functions and development of laboratories. Importance of research to product development and application is told.

20. Acid Inhibitor

William M. Parkin Co.—8-page bulletin, "Making Acid Behave with Nep". This product is a pure, concentrated inhibitor which is said to reduce acid attack on steel by 95 per cent when used in pickling solutions and produce better results.

21. Heat-Treating

Leeds & Northrup Co.—24-page illustrated broadside No. T describes "L & N" heat-treating furnaces for carburizing, tempering, hardening and nitriding. Application and advantages of special and standard methods are explained.

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22. Wire Rope Slings

Broderick & Bascom Rope Co.—96-page illustrated, "Rigger's Handbook", includes engineering, application and design information on "Yellow Strand" wire rope slings, "Murray" plaited safety slings and describes fittings, socketing, and splicing. Many helpful hints on proper use and care of slings are given.

23. Electric Furnaces

Ajax Electrothermic Corp.—24-page illustrated bulletin No. 10 describes "Ajax-Northrup" oscillator or spark-gap type converters and electric furnaces. Operating principle of these units which range in size from a fraction of a pound to several tons capacity is explained. Advantages, field of use, available types, and construction are described.

24. Hydraulic Presses

Erie Foundry Co.—24-page illustrated bulletin No. 334. Goose-neck type, standard and strain-rod type moulding, platen, side strain-plate, mat, special, open side, and forging hydraulic presses are described, as well as hydraulic elevators or lift tables, steam and board drop hammers, single and double frame forging hammers and geared trimming presses.

25. Drop Forgings

J. H. Williams & Co.—Drop-forgings data folder is of correct size to fit a standard letter file. Provision is made for memoranda. Data imprinted includes weights of metals, die draft equivalents and complete information on drop forgings for draftsmen and designers. Indexed blueprint gives features to be included in design.

26. Sprockets and Chain

Boston Gear Works, Inc.—48-page illustrated catalog No. 50-C gives prices and specifications of "Boston" sprockets and chains from stock. Attachments, dimensions, drives, horsepower selection and engineering data are included in this book.

27. Winches

Stephens-Adamson Manufacturing Co.—4-page illustrated bulletin No. 340 describes a complete line of hand and motor winches for lifting and pulling loads up to 3000 pounds. Specifications on all types are included and typical installations are shown.

28. Contour Sawing

Continental Machines, Inc.—160-page illustrated, "Contour Sawing Handbook", is a treatise on new metal cutting process. Ways to cut machining costs, selection and cutting speeds of saws, and engineering data are included in this book.

29. Surface Grinders

Blanchard Machine Co.—12-page illustrated catalog No. 217 gives complete construction and operation details of the No. 11 surface grinder which is designed to give great accuracy, produce a fine finish and meet exacting requirements. Features of machine are described in detail.

30. Furnace Linings

Laclede-Christy Clay Products Co.—4-page illustrated bulletin, "Laclede Metaltite", describes refractory jointing material for foundry applications in air furnaces, cupolas, electric furnaces and ladles. Product is said to resist slags, molten metal, chemical reaction and extreme temperatures.

31. Speed Reducers

D. O. James Manufacturing Co.—40-page illustrated catalog No. 18 covers a line of motorized worm gear speed reducers for practically every application requiring from ⅛ to 50 horsepower or larger. Features include choice of motors, high efficiency, accessibility and compactness, it is said.

32. Turret Lathe Data

Gisholt Machine Co.—Performance data sheets Nos. 46 to 49 include case studies of latest methods in metal turning operations using "Gisholt" turret and automatic lathes. Actual tooling is clearly illustrated for each job and operation sequence, and machining time is given.

33. Channel Floor

Belmont Iron Works—24-page illustrated bulletin, "Belmont Interlocking Channel Floor", explains design, construction and application of this rolled structural steel flooring for bridge decks, pier decks, building floors, grade crossings and similar structural work.

34. Aluminum Alloys

Ampco Metal, Inc.—Engineering data sheet No. 78 is one of a series giving application and engineering information on "Ampco Metal". Application of aluminum bronze type alloy to gearing of the "McCullough" positive displacement supercharger is illustrated and explained.

35. Positive Centrifuges

National Acme Co.—16-page illustrated catalog No. P-41 gives complete information on a line of positive centrifuges for lubricants and coolants, enamels and lacquers, vegetable, fish and animal oils, petroleum treating, chemical processing, pharmaceuticals and other specialties. Suggested plant layouts and typical applications are shown.

36. Tool Steels

Carpenter Steel Co.—16-page illustrated bulletin, "Spotlighting a New Hidden Way to Get More from Your Present Production Set-up", shows method of evaluating essentials of good tools. These essentials are design, making, steel and heat treatment. Describes the matched set method which utilizes only nine "Matched" tool steels. Case records of tool results with this method are given.

37. Needle Bearings

Torrington Co.—32-page illustrated catalog No. 22 deals with needle bearings. Advantages, general design and manufacture, specifications and tolerances, and rated load capacity of various types of needle bearings are given. Such information as shaft hardness, assemblies, use of load capacity tables, lubrication, installation and fits are covered.

38. Welding Electrodes

Westinghouse Electric & Manufacturing Co.—12-page illustrated bulletin No. 26-645 presents physical properties and uses of various types of electrodes for arc welding, cutting and hard surfacing. Helpful operating suggestions are made and data includes lengths, weights, number of electrodes per pound, and recommended welding current values.

39. Nickel Alloy

International Nickel Co.—3 x 5-inch celluloid "Hardness Conversion Table for Nickel Alloy Steels" is a handy tabulation for conversion of hardness to Brinell, Rockwell, Vickers or Firth, and Shore. Included are S.A.E. standard specifications for nickel steels, nickel chromium steels, nickel molybdenum steels and corrosion and heat resisting alloys.

40. Spray Painting

DeVilbiss Co.—32-page illustrated handbook "The A B C of Spray Painting Equipment" describes practically every spray painting equipment item. Subjects treated include the gun, its troubles, remedies and accessories; material containers; hose and hose connections; air transformers and condensers, and air compressing outfits. Diagrams aid explanatory text.

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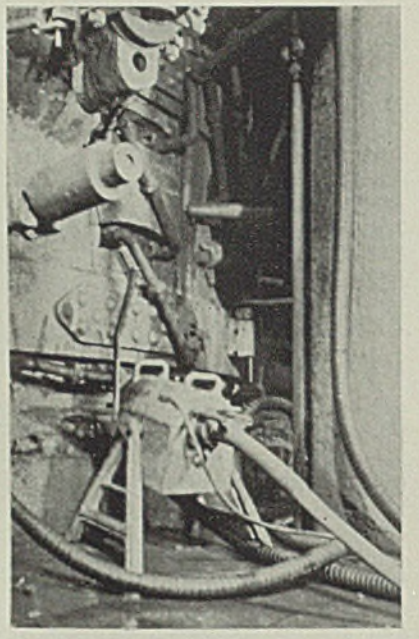
der, one to load the welding fixture and the other to operate the foot switch and slide the fixture along after each weld. Speeds of 150 spots per minute can be attained. The machine is adaptable for many other types of jobs.

Coil Cleaning Tool For Blast Furnaces

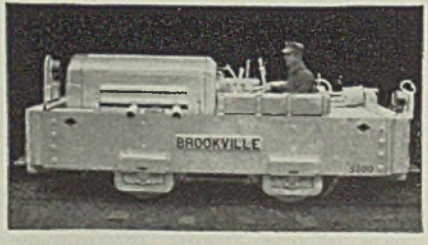
■ Pittsburgh Pipe Cleaner Co., Oliver building, Pittsburgh, announces a new tool for use in its large B pipe-cleaning machine which will thoroughly clean the coils in



blast furnace cooling plates. Pipes are cleaned like new, and in some cases it reduces the cleaning time some 300 per cent.

Diesel Locomotive

■ Brookville Locomotive Co., Brookville, Pa., has introduced model BMG diesel locomotive for pulling loads under low clearances. The engine is a General Motors series 71-6 two-stroke cycle diesel, developing 120



horsepower. The locomotive through a range of four speeds, in both forward and reverse, is capable of speeds of 15 miles per hour, pulling heavy loads on grades in the higher gears.

It also features 4-wheel drive, steel tires, dual journal spring suspension which permits negotiation of rough, uneven tracks or sharp curves at relatively high speed.

Speed-Variator

■ General Electric Co., Schenectady, N. Y., has developed a complete speed-variator equipment operating from alternating current to provide wide ranges of adjustable speed by means of a generator-voltage-control scheme. Equipment consists of an adjustable-speed, direct-current motor, an adjustable voltage motor-generator set with control and a separately mounted generator-field rheostat. Standard speed ranges are available up to 16:1 ratio.

The adjustable-speed, direct-current motor can be mounted directly on the driven machine, with speed-changing control mounted near-by. The units operate from 3-phase, 60-cycle, 220, 440 and 550-volt alternating current power. The potentiometer type generator field rheostat provides speed changes in small increments over wide ranges.

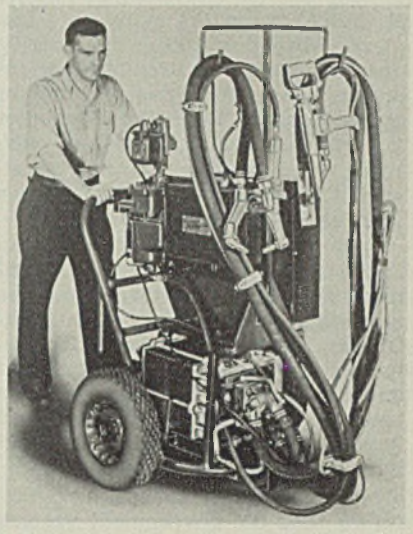
Plastic Gage Cover

■ Ashcroft Gauge division, Manning, Maxwell & Moore Inc., Bridgeport, Conn., announces a new Durafront or plastic safety gage cover which eliminates possibilities of workers being injured by broken gage glass. It is molded of clear plastic with a tensile strength of 5000 pounds and a compression strength of 15,000 pounds. A feature of the cover is it increases readability. It is available in sizes to fit 3½, 4½ and 6-inch gages.

Spot Welding Unit

■ Progressive Welder Co., 3050 East Outer drive, Detroit, announces a new 2-gun portable spot welding unit for heavy duty welding requiring high point pressures, large capacity transformer and adjustable weld time control. It is equipped with pneumatic tires for easy portability. Unit consists of two spot welding guns, transformer, air-hydraulic pressure booster, weld timer and contractor. Both the push gun (supplied with grounding clamp) and scissors type gun operate from the single transformer mounted in the base of the carriage. Welding point pressures up to 1000 pounds (for the scissors type gun) are supplied by the booster mounted above the transformer and operating from the factory air pressure line. Provision is made to water cool gun jaws and points through individual supply and return lines. Transformer also is water cooled.

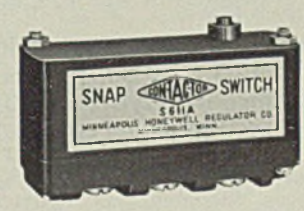
When using for more than one type of welding, a special weld timer



having two separate dials permits adjustment for two separate weld times for each gun. Therefore, each gun is supplied with two control buttons. In addition two operators can use both guns simultaneously on different types of work.

Snapswitch

■ Minneapolis-Honeywell Regulator Co., 2950 Fourth avenue South, Minneapolis, has introduced a new S611 Con-Tac-Tor snapswitch. It is of the snap acting, nonmagnetic type entirely enclosed in a black bakelite case with high electrical rating (1 horsepower 110 volt alternating current, 1½ horsepower 220 volt alternating current). In-



corporating a single-pole double-throw switch with three built-in terminals, it is designed to break one set of contacts and then make the other set of contacts when actuated. There is no overlapping of break and make. Types available include push-in self-restoring actuator, pull-out self-restoring actuator and push-in and pull-out nonself-restoring actuator.

Britain Helps Canada Expand To Produce More War Material

TORONTO, ONT.

■ CANADA, with many of her plants already working at capacity on war orders, is attempting to increase further industrial production and capacity. Both the Dominion government and the British government are granting financial assistance toward building new factories and extending present plants.

C. D. Howe, minister of munitions and supply, last week announced more than 20,000 contracts for war materials, totaling more than $300,000,000, have been placed with Canadian companies by the Dominion and British governments. For the past six weeks, contracts placed have averaged more than 900 weekly.

Mr. Howe also warned manufacturers that the government prefers to deal directly with company officials rather than through middlemen. He stated:

"It has come to my attention that certain contractors or prospective suppliers have been approached by persons who have attempted to persuade them of the advisability of employing such persons as their agents or otherwise to represent them in their dealings with the department of munitions and supply. I wish most emphatically to point out that no possible advantage can accrue to any concern so employing any such persons and that the department of munitions and supply, wherever it is possible to do so, deals directly with the supplier. Any prospective supplier desiring to have his name listed with the department has only to write to the department indicating the location of his plant, his manufacturing facilities and the type of supplies in which he deals."

War Purchases Control Unified

As of July 1, Mr. Howe in Canada and Arthur B. Purvis in the United States, assumed complete control and authority over British war purchases on this continent. This step removes the overseas restrictions that have slowed British purchases since the beginning of the war.

British supply board has assumed the capital cost of plant construction on behalf of some 35 Canadian companies, the department of munitions and supply announced. By far the largest portion of these plants are already producing munitions, explosives, and other war materials, but several are still under construction and two are to be built soon. For these plants the British supply board has made commitments well in excess of $50,000,000.

The plants, it is estimated, will produce war materials valued at more than $250,000,000 annually. The output of plants thus financed includes small arms ammunitions, high explosives and propellants, 25-pounder field guns, 40-millimeter and 3.7-inch gun barrels, six different types of shells, cartridge cases, fuses, and primers and other requisites. In addition to financing these 35 plants the British board has placed orders for one year's output.

Canadian industry is co-operating with the government and military technical experts in producing heavy tanks, of which 300 already have been ordered. Many difficulties beset Canadian industry in building heavy tanks, which are protected with armor plate more than four inches thick not readily obtainable in Canada. They also require diesel engines, heavier and more powerful than those in production in Canada. It is believed that the heavy armor plate and diesel engines will be obtained in the United States.

Canadian GM in Full Swing

Harry J. Carmichael, vice president, General Motors Corp. of Canada Ltd., Oshawa, Ont., has announced his company has thrown its full weight behind Canada's war effort. He stated an additional $1,297,000 has been appropriated by the company for factory re-arrangement, which brings the total to $3,000,000 for plant adjustment since February.

Mr. Carmichael stated: "We have appropriated $3,000,000 to speed up deliveries and production rates. In addition to about $1,000,000 for rearrangement of plants and equipment, $300,000 is going into a new assembly line for army trucks, and $485,000 more for special tools to increase facilities. The plants involved are located at Oshawa, St. Catharines and Windsor. Outlay at one plant alone will be $1,175,000 this year. Tooling at another plant is being rushed 24 hours a day and seven days a week. General Motors' part in building light-armored carriers consists of collaboration with the Ford Co. of Canada Ltd., Windsor, Ont., by supplying component parts."

Contracts placed by the department of munitions and supply, Ottawa, Ont., during the past week numbered 764, having total value of $10,813,041. More important awards:

Shipbuilding—Burrard Dry Dock Co. Ltd., North Vancouver, B. C., $4,017,600; North Van Ship Repairs Ltd., North Vancouver, B. C., $4,017,600; R. M. Betts, Halifax, N. S., $46,000; St. John Dry Dock & Shipbuilding Co. Ltd., St. John, N. B., $11,500; W. C. McKay & Sons, Ltd., Shelbourne, N. S., $7452.

Ordnance — Auto-Ordnance Corp., New York, $5957; Saginaw Stamping & Tool Co., Saginaw, Mich., $8483.

Aircraft supplies—Canadian Pratt & Whitney Aircraft Co. Ltd., Longueuil, Que., $30,971; Fairchild Aircraft Ltd., Longueuil, Que., $40,000; Aviation Electric Ltd., Montreal, $23,370; British Aeroplane Engines Ltd., $158,201; Noorduyn Aviation Ltd., Montreal, $35,164; Irvin Air Chute Ltd., Ottawa, $73,093.

Mechanical Transport — General Motors Products of Canada Ltd., Oshawa, $13,849; W. D. Beath & Son Ltd., Toronto, $65,040; Massey-Harris Co. Ltd., Toronto, $75,150; Godfredson Ltd., Walkerville, Ont., $35,228; Ford Motor Co., of Canada, Ltd., $30,027.

Final Claims Allowed In Follansbee Case

■ Judge Robert M. Gibson in United States district court in Pittsburgh last week ordered payment of $149,002 in cash and 9874 shares of new Follansbee Steel Corp. common stock on final claims arising from the trusteeship and reorganization of Follansbee Bros. Co. Of the total amount awarded, the stock shares and $125,600 in cash represented compensation for services and $23,402 was reimbursement for expenses. Petitions filed with the court had asked a total of $640,000, but cash payments were limited to $150,000 in accordance with a provision of the reorganization plan approved by the court on Jan. 6.

Change Name of Ductiloy

■ The special low alloy steel known to the trade as Ductiloy will henceforth be marketed under the trade name of N-A-X High Tensile, it is announced by National Steel Corp. N-A-X High Tensile is a product of Great Lakes Steel Corp., Detroit, unit of National Steel. There will be no change in the chemical or physical properties of the product.

■ May factory shipments of household washers totaled 118,987, a decrease of 13.2 per cent from April and an increase of 13 per cent over May 1939, according to American Washer and Ironer Manufacturers' association, Chicago.

Built-To-Order

(*Continued from Page* 53)

are provided with pointed tips which permit the box to be pushed or skidded by hand into tight quarters. These also provide means of nesting units when they are placed on top of one another as the tips rest in the open pipe of the platform below. This nesting feature has been found extremely valuable and is easily accomplished by making the horizontal length and width dimensions of all skids the same. Thus no matter whether the skid is merely a platform, a box or a specially designed unit, it can be nested with others of any type used in the plant.

By making these horizontal length and width dimensions correspond to clearance necessary for the lift platforms of the mechanical lift buggies and lift trucks, any one unit or any nested stack of units can easily be moved about. This affords an extremely efficient and low-cost system of handling a wide variety of parts from department to department and from building to building. It also serves outside storage areas efficiently.

Buggies Handle Larger Pieces

To handle pieces of larger size than are suitable for use with the skid platforms and skid boxes, various trailer units or buggies are available. It is easy to form a train of such units behind a power truck, see Fig. 1, as each trailer is provided with a hook at its rear into which the handle of a following truck can be attached quickly. A number of these trucks are illustrated in Figs. 3, 4 and 5 to show the wide varieties possible. Such units can be made to accommodate almost any type of handling problem efficiently.

For instance, the unit in Fig. 3 is employed in handling large heavy machines in and out of the painting room and so is made quite wide and long and is provided with a "tail" at the rear to give maximum supporting area. While this particular unit is used primarily in the painting room, it also serves as a rack for cleaning as well as a rack for painting. In addition, it affords a means of storing the work between operations and can be made into a train as in Fig. 1 for easily transporting a large volume of work around the plant at one time.

In Fig. 4 is still another unit especially designed for a job. This vehicle is an effective means of moving large plates or thin structures. The load is hauled on edge. Note the simple yet strong and rigid welded steel construction employed. Such a simple functional design as this obviates any excess material or weight, yet is extremely rigid and practical. Large plates can be moved about easily and surely on edge in these carts without blocking aisles or congesting production work in nearby departments.

Fig. 5 shows yet another type. This platform on wheels literally "turns on a dime" and at the same time accommodates heavy loads of a large variety of shapes with ease, thus serving its function as a part collecting platform for the shipping department. Provided with wide rubber tires and antifriction bearings, heavy loads can be moved easily by hand on this type of buggy.

Varieties of these buggies are limited only by the ingenuity of the builder. For example, for moving light loads about the plant quickly by hand, a similar buggy is employed using two wheels mounted approximately at the center with two lifting handles projecting from the rear to permit the buggy to be moved about easily by hand. Provided with rubber tires and made of light sheet and angles, it provides means for quickly moving

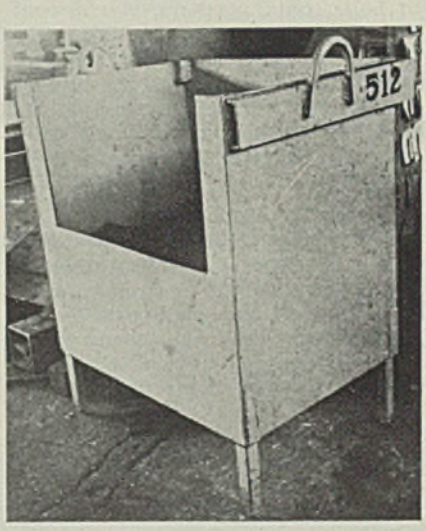


Fig. 6—Standardized tote bin of 1/8-inch steel plate holds 10 tons yet can be moved about easily

work which otherwise would be a serious handling problem. It is particularly useful in collecting parts in the stockroom.

Most of the trailers or buggies utilize a 3-wheel design as this gives added lightness and mobility over a 4-wheel design at the same time reduces cost of making the unit and amount of material used. Even the smallest and simplest of these buggies easily carries a 10-ton load, yet represents a small amount of material and low initial manufacturing cost. It is difficult to see how such units could be made any lighter, stronger, more serviceable or more easily handled at a cost comparable with these.

Skid platforms such as Fig. 2 are exceptionally advantageous in the assembly department where a deep portable bin would involve some difficulty in removing parts. Note the design of the sideboard is characteristically simple. It consists merely of a thin long plate or sheet bent to form three corners and are welded at the fourth corner where the ends overlap. The sides are reinforced by four pieces of light angle iron intermittently welded to the plate to form a triangular section of considerable strength.

Deep Bins Handled by Hoists

Of course, there are many places where a deep bin is desired, and for such applications a unit like that supported directly on the lift platform of the truck in Fig. 1 is employed. This skid box or tote bin is essentially a skid with permanent sideboards, reinforced bottom and loops for handling with hoist or crane. Both skids and tote bins in Figs. 1 and 2 have a capacity of over 5 tons, yet either can be slid on the floor by one man or carried by two men for such short distances as are at times necessary in placing an empty bin within convenient reach of an operator. Such lightness and strength combined would be difficult to achieve in wood or even with some steel constructions. Welding eliminates necessity of overlapping joints and reinforcement plates, thus cutting weight yet maintaining full strength.

There is practically no maintenance cost on either the skids or tote bins except an occasional cleaning and painting. Some of these units have been in constant and extremely rigorous service for over three years, subjected to hard usage and heavy loading. It is believed no other type of construction would have permitted these units to withstand the heavy duty imposed upon them without maintenance costs being excessive.

Still another type of bin is illustrated in Fig. 6. This is a deep unit for handling and storing scrap steel. It is a simple modification of the other types of bins, yet it has a capacity of at least 10 tons of solid small pieces such as punchings. This unit is made of angle iron framework with walls of 1/8-inch steel plate. Boards are inserted in the front as the bin is filled and are removed as the bin is emptied. Such a unit provides easy access to the bottom, yet has a high cubicle content when filled. It amply illustrates the extreme flexibility possible in building bins. By welding a socket at the upper four corners and using pins at the bottom of the legs, these units can be nested as high as desired to utilize floor space effectively in storage areas.

(*Concluded next week*)

Shipbuilding

(*Concluded from Page 47*)

erected as a single unit on the shoring provided for that purpose, thus enabling the erection of all framing and beams without difficulty.

In connection with their assembly, it was found helpful to introduce the almost forgotten steel hairpin, with which a sort of cradle is formed, thus supporting the upper ends of the frames, and to which the framing is tack welded in place.

In keeping with accepted practice, the cruiser stern is made the subject of a ground assembly with all members completely welded prior to its erection.

Exterior staging supports are entirely of steel construction, each upright constructed to form a ladder. These uprights require a minimum of space and reduce the fire hazard materially. The building of all-welded ships permits the entire system of staging to be considerably simplified due to the absence of heavy crafts such as reaming, bolting and riveting.

Single-operator direct-current welding machines predominant and are divided between 400 and 300-ampere units.

Unionmelt welding equipment consists of two machines of 1200-ampere capacity using a V-type welding head propelled on a traction carriage mounted on 6-foot lengths of track. Table I shows the speed, amperage and voltage employed for various thicknesses of deck plating.

A 500-ampere constant-current multiple-operator welding machine is provided for tack welding operations in connection with assembly of work on the platens.

The entire absence of reaming, riveting and other noise-producing equipment results in a practically noiseless shipyard where it is possible to carry on a conversation without difficulty. The only exception is a relatively small number of chipping hammers found desirable for certain work.

TABLE I

Unionmelt Welding Data

Plate thickness inch	Speed inches per minute	Amperes	Volts
3/8	9	900	32
5/8	11	850	31
1/2	15	750	28
1/4	13	300	28
Square Butt			
3/8	22	900	32

During the construction period, the welded ship is almost entirely free from debris due to elimination of bolts, nuts, washers, rivets, coal ashes, etc. While this results in only a small reduction in cost, one considers the savings made possible by eliminating cost of these bolts as well as handling, reclaiming and investment in reclaiming plant itself, the savings over a period of time are considerable.

Small hand tools are of interest. Each structural worker is supplied with a small steel tool box containing a lightweight maul, hand hammer, steel heel wedges, pinch bar and push-and-pull jacks.

The eight C-3 welded cargo ships of 8500 gross tons each now being constructed in this yard represent over 20 million dollars worth of work. This is the first time in this country that a large shipyard has been built exclusively for the building of welded ships. The new yard is modern in every respect and represents a distinctly progressive step in shipbuilding methods.

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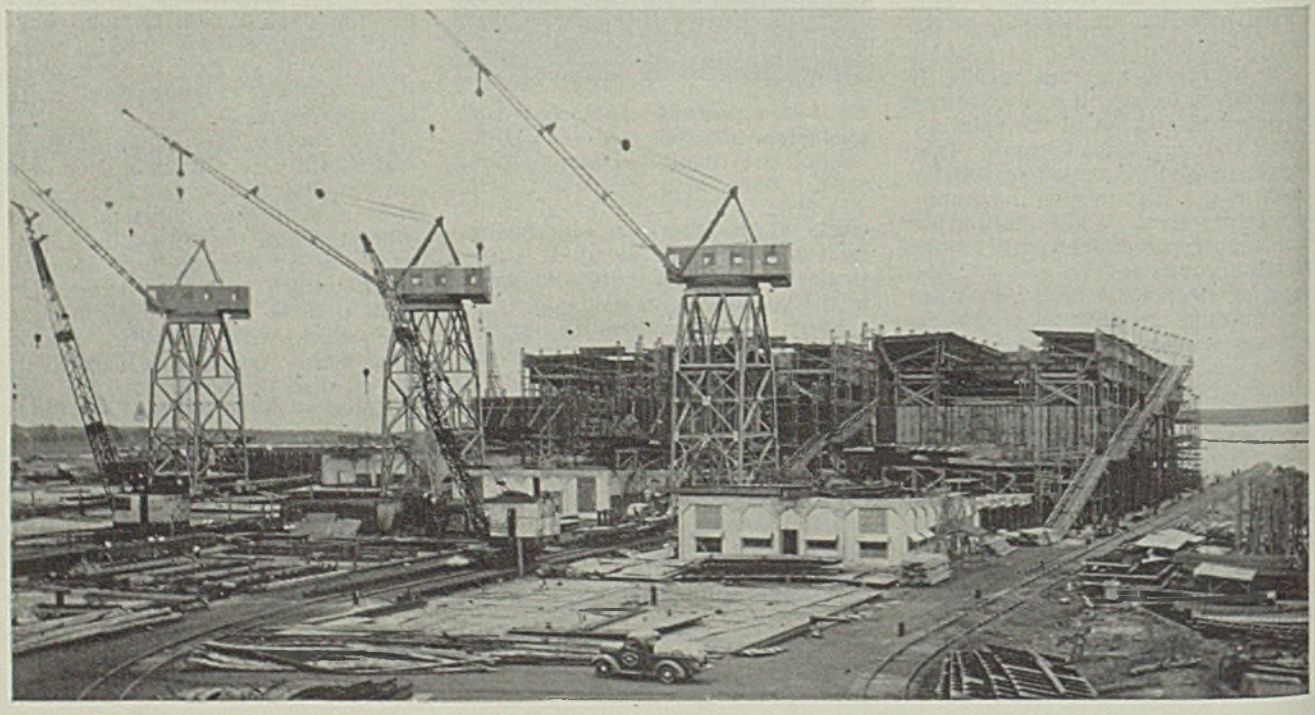
Mass Production

(*Concluded from Page 48*)

ciently with only one-third the amount of work needed if identical pieces were being handled.

In operation, compressor housing and cylinder are loaded into quick-acting and self-locating fixtures on left while entire work table is moving to the right in machining the connecting rod. Similarly, work-table fixture for connecting rod is unloaded and reloaded while the two spindles at left are boring the housing and cylinder. Thus no time is lost as loading and reloading of fixtures is done while machining at other end of work table which moves back and forth. Spindle heads and individual motor drives are on bridges which span work-table ways. These can be relocated as desired.



General view of building ways from land side showing structural erection and general platen assembly area. Comparatively large subassemblies are put together on the big platens where a total area of approximately 23,000 square feet is available for this work

Holiday Interruption Cuts Steel Production

Mills to resume high output this week. Scrap weakness continues. Ore movement heavy. Pig iron production in sharp gain

MARKET IN TABLOID ★

Demand
Continues heavier than deliveries.

Prices
Firm; reinforcing bars increased.

Production
Holiday drop of 14 points to 75 per cent.

■ GENERAL observance of Independence Day last week took toll of steel producton, idleness on Thursday resulting in loss of 14 points to 75 per cent of capacity.

However, rebound is expected this week to the level of the preceding week, slightly less than 90 per cent. In fact some producers resumed at the high rate on Friday, in effort to meet delivery requirements and to make progress against the mounting order backlog now accumulating. Some small buying for defense purposes is being done but full weight of such requirements is still in the future. Many steel consumers are seeking to increase inventories to furnish a supply in case priorities are put into effect. Deliveries in some products, notably bars, are falling several weeks behind. Most low-priced sheets bought last spring have been delivered and this makes way for new demand, which is heavy.

June pig iron output was 3,813,092 net tons, an increase of 9 per cent over 3,497,157 tons in May and was the highest total since January, when 4,024,556 tons were made. The daily rate was 127,103 tons, an increase of 12.7 per cent over 112,811 tons daily average in May, also the highest rate since January. Total output for six months was 21,042,643 tons, compared with 14,023,668 tons for the comparable portion of 1939. It was the highest first half since 1937, when the total was 22,143,895 tons. Active blast furnaces the last day of June numbered 181, a gain of ten over the end of May, the highest number since December, 1939, when 191 were in blast.

Structural steel extras have been revised drastically as of July 1, the new schedule succeeding that of July 1, 1938. The changes include size, quantity and length extras, some new classifications and listings. The new schedule was issued by Carnegie-Illinois Steel Co., Pittsburgh, and is expected to be followed by other producers. The changes are made to take into account developments in steelmaking and fabrication since the former card was formulated.

Placing of 7575 freight cars in June indicated the new interest taken by the carriers in providing for expected transportation activity. June placements were the largest for any month since April, 1937, except for September and October, 1939. During first six months this year 16,173 freight cars were placed, largest first half orders since 1937. Chesapeake & Ohio last week distributed 1000 box cars and 100 cabooses, and the Pennsylvania awarded 2545 freight cars and 25 cabooses to its own shops. The Santa Fe is inquiring for ten steam locomotives in addition to the two large diesel-electric freight road engines awarded a week ago. It is reported the British buying commission has placed 112,000 tons of 90-pound steel rails, half with a Pittsburgh mill, to be shipped by Aug. 15. They are said to be for use in rapid repair in case of air raid damage.

Automotive production is feeling the seasonal effect more sharply, production last week dropping to 51,975 units from 87,550 the previous week, a sharper shrinkage than has been registered for some time. However, output still is well above the comparable week last year, when 42,784 cars were made.

Iron ore shipments from upper lake ports in June totaled 9,525,494 gross tons, an increase of 3,952,496 tons over the corresponding month last year. Cumulative tonnage to July 1 aggregated 17,268,690 tons, compared with 9,231,249 tons to the same date last year. This is a gain of 8,037,441 tons, 87 per cent.

All districts participated in the loss of production, due to Fourth of July shutdowns, though not in equal degree. The 14-point loss to 74 per cent of capacity was normal as compared with other years. Chicago dropped 15 points to 77 per cent, Birmingham 17 points to 71 per cent, Cincinnati 27 points to 54 per cent, St. Louis 18½ points to 52, Detroit 13 points to 79, Cleveland 16½ points to 69, Pittsburgh 18 points to 64, Wheeling 15 points to 75, New England 5 points to 80, Buffalo 18 points to 74, Eastern Pennsylvania 11 points to 72 and Youngstown 10 points to 70.

In absence of general buying scrap shows weakness and supply appears adequate to meet demands, prices yielding further in some instances and remaining nominal in others. The composite of steelworks scrap declined 21 cents further last week, to $18.83 and the iron and steel composite yielded 4 cents to $37.72 because of scrap changes. The finished steel composite was unchanged at $56.60.

COMPOSITE MARKET AVERAGES

	July 6	June 29	June 22	One Month Ago June, 1940	Three Months Ago April, 1940	One Year Ago July, 1939	Five Years Ago July, 1935
Iron and Steel	$37.72	$37.76	$37.80	$37.69	$36.69	$35.82	$32.44
Finished Steel	56.60	56.60	56.60	56.60	55.90	55.62	54.00
Steelworks Scrap..	18.83	19.04	19.75	19.03	16.00	14.72	10.64

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

	July 6, 1940	June 1940	April 1940	July 1939
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Iron bars, Chicago	2.25	2.25	2.25	2.05
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.00	2.00
Sheets, cold-rolled, Pittsburgh	3.05	3.05	2.95	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	1.95	2.00
Sheets, cold-rolled, Gary	3.05	3.05	2.90	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.40

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 ⅜-inch, Pitts.	2.00	2.00	2.00	1.92

Pig Iron

	July 6, 1940	June 1940	April 1940	July 1939
Bessemer, del. Pittsburgh	$24.34	$24.34	$24.34	$22.34
Basic, Valley	22.50	22.50	22.50	20.50
Basic, eastern, del. Philadelphia	24.34	24.34	24.34	22.34
No. 2 foundry, Pittsburgh	24.21	24.21	24.21	22.21
No. 2 foundry, Chicago	23.00	23.00	23.00	21.00
Southern No. 2, Birmingham	19.38	19.38	19.38	17.38
Southern No. 2, del. Cincinnati	22.89	22.89	22.89	20.89
No. 2X, del. Phila. (differ av.)	25.215	25.215	25.215	23.215
Malleable, Valley	23.00	23.00	23.00	21.00
Malleable, Chicago	23.00	23.00	23.00	21.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	28.34
Gray forge, del. Pittsburgh	23.17	23.17	23.17	21.17
Ferromanganese, del. Pittsburgh	125.33	115.33	105.33	85.33

Scrap

Heavy melt. steel, Pitts.	$19.75	$19.90	$16.45	$15.55
Heavy melt. steel No. 2, E. Pa.	18.00	18.10	15.50	13.55
Heavy melting steel, Chicago	17.75	18.00	15.20	13.55
Rails for rolling, Chicago	22.25	22.25	18.65	17.75
Railroad steel specialties, Chicago	21.75	21.40	18.05	15.50

Coke

Connellsville, furnace, ovens	$4.75	$4.75	$4.75	$3.75
Connellsville, foundry, ovens	5.75	5.75	5.75	5.00
Chicago, by-product fdry., del.	11.25	11.25	11.25	10.50

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

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. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
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 strip	22.00	22.50	32.00	52.00

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

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	4.00c

Structural Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast ports	2.70c

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

Rail Steel

(Base, 5 tons or over)

Pittsburgh	2.05c
Chicago or Gary	2.05c
Detroit, delivered	2.15c
Cleveland	2.05c

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.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.30c

Rail Steel Bars, Base

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.80c
Gulf ports	2.15c
Pacific Coast ports	2.20c

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)	67
Single loop bale tie. (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

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, Chicago, Massillon, Canton, Bethlehem 2.70c

Detroit, delivered 2.80c

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55

4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10

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.

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	2.80c
Chicago	2.90c
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. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 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	67	70
⅝-1-inch	64	65
1⅛-1½-inch	62	62
1⅝ 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
⅝-inch and under	65-10 off

Wrought washers, Pitts., Chi., 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 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½

Iron

¼	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	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
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	.....
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼ "O.D.	13	9.26	10.67
1½ "O.D.	13	10.23	11.79
1¾ "O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼ "O.D.	13	14.54	16.76
2½ "O.D.	12	16.01	18.45
2½ "O.D.	12	17.54	20.21
2¾ "O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½ "O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½ "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—Per 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

Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., 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 ⅝-inch incl. (per 100 lbs.)	$2.00
Do., over ⅝ to 47/64-in. incl.	2.15

Worcester up $0.10; Galveston up $0.25; Pacific Coast up $0.50.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.35- 4.60
Connellsville, fdry.	5.00- 5.75
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.	10.50
Chicago, delivered	11.25
Terre Haute, del.	10.75
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	10.75
Cincinnati, del.	10.50
Cleveland, del.	11.05
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

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.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.‡	19.38	....	18.38	24.00
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
Erie, 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
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

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	....
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		Charcoal	
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

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Domestic dead - burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$50.00
Chem. bonded chrome	50.00
Magnesite brick	72.00
Chem. bonded magnesite	61.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$25.00-$26.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	20.00
Do. barge	20.00
No. 2 lump	21.00

Ferroalloy Prices

Ferromanganese, 78-82%,
carlots, duty pd. $120.00
Ton lots 130.00
Less ton lots 133.50
Less 200 lb. lots 138.00
Do., carlots del. Pitts. 125.33

Spiegeleisen, 19-21% dom.
Palmerton, Pa., spot 36.00
Do., 26-28% 49.50

Ferrosilicon, 50% freight allowed, c.l. 74.50
Do., ton lot 87.00
Do., 75 per cent 135.00
Do., ton lots 151.00
Spot, $5 a ton higher.

Silicomanganese, c.l., 2½ per cent carbon 118.00
2% carbon, 108.00; 1%, 133.00
Contract ton price $12.50 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.90-2.00

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

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

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 11.00c
Do., ton lots 11.75c
Do., less-ton lots 12.00c

67-72% low carbon:

	Carloads	Ton lots	Less ton
2% carb.	17.50c	18.25c	18.75c
1% carb.	18.50c	19.25c	19.75c
0.10% carb.	20.50c	21.25c	21.75c
0.20% carb.	19.50c	20.25c	20.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. tl., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk 7.00c
Do., ton lots 7.50c
Do., less-ton lots 7.75c
Do., less 200 lbs. 8.00c
Spot, ¼c higher.

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.50
Do., smaller lots 2.60

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 84.00c
Do., spot 89.00c

98% chrome, contract 83.00c
Do., spot 88.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ¼-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads, bulk, freight allowed, ton $69.50
Ton lots 79.50
Less-ton lots, lb. 3.75c
Less 200 lb. lots, lb. 4.00c
Spot ¼-cent higher.

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton 102.50
Do. spot 107.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Struc-tural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.66	3.46	4.13	8.63	7.23
New York Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.05	3.31	4.09	8.59	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.25	3.31	4.06	8.56	7.16
Baltimore	3.95	4.05	4.45	3.70	3.70	5.25	3.55	....	5.05	....	4.05	....	....
Norfolk, Va.	4.15	4.25	....	3.90	3.90	5.45	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.00	3.22	3.75	8.15	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	....	4.45	....	3.65	8.15	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.42	3.20	3.75	8.15	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.23	4.30	4.64	3.20	3.80	8.45	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	....	5.00	....	4.42	....	....
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.47	4.00	8.50	7.10
Chicago	3.50	3.40	3.40	3.55	3.55	5.15	3.05	4.10	4.60	3.30	3.75	8.15	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	....	4.76	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.70	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.33	4.33	5.93	3.99	....	5.71	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.88	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....	....	....	....
Seattle	4.00	3.85	5.20	3.65	3.75	5.75	3.70	6.50	5.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.60	4.45	4.00	4.00	6.40	4.30	6.50	5.25	....	6.60	10.65	9.80
San Francisco	3.50	4.00	6.00	3.35	3.35	5.60	3.40	6.40	5.15	....	6.80	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.10	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.20	5.75	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.48	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	3.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 300-4999 in San Francisco, Portland; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, 1500-3499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 10 to 24 bundles in Philadelphia.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, July 3

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports: £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons‡‡: **Quoted in gold pounds sterling: £ s d
Foundry, 2.50-3.00 Si.	$22 92 6 0 0*	$33.23	3 18 0
Basic bessemer	.....	.....	.....
Hematite, Phos. .03-.05	23 88 6 5 0*	.....	.....
Billets	.....	$31.95	3 15 0
Wire rods, No. 5 gage	.....	60.71	7 2 6
Standard rails	$49.11 10 10 0	$48.99	5 15 0
Merchant bars	2.30c 13 10 0	2.77c	7 6 0
Structural shapes	2.13c 12 10 0	2.83c	7 9 0
Plates, 1¼ in. or 5 mm.	2.25c 13 5 0	3.53c	9 6 0
Sheets, black, 24 gage or 0.5 mm.	2.89c 17 0 0	2.98c	7 17 0*
Sheets, gal., 24 ga., corr.	3.45c 20 6 3	3.94c	10 7 6
Bands and strips	.....	2.76c	7 5 0
Plain wire, base	.....	3.15c	8 6 3
Galvanized wire, base	.....	3.75c	9 17 6
Wire nails, base	.....	3.50c	9 7 6
Tin plate, box 108 lbs.	$ 5.83 1 10 6	.....	.....

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs‡‡	Belgian ‡‡Francs		Reich ‡‡Mar
Fdy. pig iron, Si. 2.5	$21.20 5 11 0	(a)$17.18	788	$31.44	950	$25.33	63
Basic bess. pig iron	19.96 5 4 6	(a)	...	29.79	900	27.94	(b) 69.50
Furnace coke	6.05 1 11 8	4.91	225	10.92	320	7.64	19
Billets	35.81 9 7 6	26.62	1,221	42.20	1,275	38.79	96
Standard rails	1.90c 11 3 0	1.69c	1,692	2.06c	1,375	2.38c	132
Merchant bars	2.38c 14 0 0††	1.53c	1,530	2.06c	1,375	1.98c	110
Structural shapes	2.11c 12 8 0††	1.49c	1,487	2.06c	1,375	1.93c	107
Plates, 1¼-in. or 5 mm.	2.13c 12 10 6††	1.95c	1,951	2.42c	1,610	2.29c	127
Sheets, black	2.98c 17 10 0§	2.30c	2,295‡	2.85c	1,900‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.53c 20 16 3	3.59c	3,589	4.80c	3,200	6.66c	370
Plain wire	3.31c 19 10 0	2.34c	2,340	3.00c	2,000	3.11c	173
Bands and strips	2.51c 14 15 0††	1.71c	1,713	2.48c	1,650	2.29c	127

†British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions. *Pig iron export reported stopped. **Gold pound sterling not quoted. ‡‡No quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	16.00
Bos. dock No. 1 exp.	16.00-16.25
New Eng. del. No. 1	16.00-16.25
Buffalo, No. 1	19.00-19.50
Buffalo, No. 2	17.00-17.50
Chicago, No. 1	17.50-18.00
Chicago, auto, no alloy	16.50-17.00
Cincinnati, dealers.	15.00-15.50
Cleveland, No. 1	19.00-19.50
Cleveland, No. 2	18.00-18.50
Detroit No. 1	†15.50-16.00
Detroit No. 2	†14.50-15.00
Eastern Pa., No. 1.	19.00-19.50
Eastern Pa., No. 2.	18.00
Federal, Ill., No. 2	15.00-15.50
Granite City, R. R. No. 1	16.00-16.50
Granite City, No. 2.	14.75-15.25
Los Ang., No. 1, net	13.50-14.00
Los Ang., No. 2, net	12.50-13.50
N. Y. dock No. 1 exp.	16.00
Pitts., No. 1 (R. R.)	21.50-22.00
Pittsburgh, No. 1	19.50-20.00
Pittsburgh, No. 2	18.50-19.00
St. Louis, No. 1	16.00-16.50
St. Louis, No. 2	15.00-15.50
San Fran., No. 1, net	13.50-14.00
San Fran., No. 2, net	12.50-13.00
Seattle, No. 1	15.00
Toronto, dirs., No. 1	11.00
Valleys, No. 1	20.00-20.50

COMPRESSED SHEETS

Buffalo, new	18.00-18.50
Chicago, factory	17.00-17.50
Chicago, dealers	15.50-16.00
Cincinnati, dealers.	14.00-14.50
Cleveland	18.50-19.00
Detroit	†17.00-17.50
E. Pa., new mat.	19.00-19.50
E. Pa., old mat.	16.00-16.50
Los Angeles, net	10.50-11.00
Pittsburgh	19.50-20.00
St. Louis	13.00-13.50
San Francisco, net	10.50-11.00
Valleys	19.25-19.75

BUNDLED SHEETS

Buffalo, No. 1	17.00-17.50
Buffalo, No. 2	15.50-16.00
Cleveland	15.50-16.00
Pittsburgh	18.50-19.00
St. Louis	11.00-11.50
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	12.50-13.00
Cincinnati, dealers.	10.00-10.50
Detroit	†13.50-14.00
St. Louis	10.00-11.00
Toronto, dealers	9.00

BUSHELING

Birmingham, No. 1.	15.00
Buffalo, No. 1	17.00-17.50
Chicago, No. 1	16.25-16.75
Cincin., No. 1 deal.	11.50-12.00
Cincin., No. 2 deal.	6.00- 6.50
Cleveland, No. 2	12.00-12.50
Detroit No. 1 new	†15.50-16.00
Valleys, new, No. 1	19.25-19.75
Toronto, dealers	5.50- 6.00

MACHINE TURNINGS (Long)

Birmingham	5.00
Buffalo	12.00-12.50
Chicago	12.00-12.50
Cincinnati, dealers.	7.00- 7.50
Cleveland, no alloy.	11.50-12.00
Detroit	†9.50-10.00
Eastern Pa.	13.00-13.50
Los Angeles	4.00- 5.00
New York	†8.50
Pittsburgh	14.50-15.00
St. Louis	9.25- 9.75
San Francisco	5.00
Toronto, dealers	7.00- 7.25
Valleys	11.50-12.00

SHOVELING TURNINGS

Buffalo	13.00-13.50
Cleveland	12.50-13.00
Chicago	12.50-13.00
Chicago, spel, anal.	15.50-16.00
Detroit	†11.00-11.50
Pitts., alloy-free	16.50-17.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†5.75- 6.25
Buffalo	11.50-12.00
Cincinnati, dealers.	6.00- 6.50
Cleveland	12.50-13.00
Eastern Pa.	11.50-12.00
Detroit	†10.50-11.00
New York	†7.00
Pittsburgh	11.50-12.00
Toronto, dealers	6.75

AXLE TURNINGS

Buffalo	16.00-16.50
Boston district	†9.00- 9.50
Chicago, elec. fur.	17.50-18.00
East. Pa. elec. fur.	17.50-18.00
St. Louis	13.00-13.50
Toronto	6.00- 6.50

CAST IRON BORINGS

Birmingham	8.00
Boston dist. chem.	†8.50- 8.75
Buffalo	11.50-12.00
Chicago	10.75-11.25
Cincinnati, dealers.	6.00- 6.50
Cleveland	12.50-13.00
Detroit	†11.00-11.50
E. Pa., chemical	14.50-15.00
New York	†7.50- 8.00
St. Louis	8.25- 8.75
Toronto, dealers	6.75

RAILROAD SPECIALTIES

Chicago	21.50-22.00

ANGLE BARS—STEEL

Chicago	21.00-21.50
St. Louis	18.50-19.00

SPRINGS

Buffalo	23.00-24.00
Chicago, coil	22.50-23.00
Chicago, leaf	21.00-21.50
Eastern Pa. crops.	24.00-25.00
Pittsburgh	25.50-26.00
St. Louis	20.00-20.50

STEEL RAILS, SHORT

Birmingham	17.00
Buffalo	24.00-25.00
Chicago (3 ft.)	21.50-22.00
Chicago (2 ft.)	22.00-22.50
Cincinnati, dealers.	22.00-22.50
Detroit	†21.50-22.00
Pitts., 3 ft. and less	25.50-26.00
St. L., 2 ft. & Less.	20.50-21.00

STEEL RAILS, SCRAP

Birmingham	15.50
Boston district	†14.50-15.00
Buffalo	22.00-22.50
Chicago	18.50-19.00
Cleveland	23.50-24.00
Pittsburgh	22.00-22.50
St. Louis	19.25-20.25
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net	12.50-13.00
Cincinnati, dealers.	11.50-12.00

RAILROAD GRATE BARS

Buffalo	13.50-14.00
Chicago, net	13.50-14.00
Cincinnati, dealers.	10.50-11.00
Eastern Pa.	15.50-16.00
New York	†11.50-12.00
St. Louis	14.25-14.75

RAILROAD WROUGHT

Birmingham	14.00
Boston district	†9.50-10.00
Eastern Pa., No. 1	20.00-20.50
St. Louis, No. 1	13.75-14.25
St. Louis, No. 2	15.00-16.00

FORGE FLASHINGS

Boston district	†11.00-11.50
Buffalo	17.00-17.50
Cleveland	17.50-18.00
Detroit	†15.00-15.50
Pittsburgh	17.50-18.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	21.50-22.00

LOW PHOSPHORUS

Cleveland, crops	24.50-25.00
Eastern Pa., crops.	25.50-26.00
Pitts., billet, bloom, slab crops	25.50-26.00

LOW PHOS. PUNCHINGS

Buffalo	21.50-22.00
Chicago	20.50-21.00
Cleveland	22.00-22.50
Eastern Pa.	25.00-25.50
Pittsburgh	24.50-25.00
Seattle	15.00
Detroit	†18.00-18.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.50
Boston	†15.75-16.00
Chicago	22.00-22.50
New York	†17.50-18.00
Eastern Pa.	23.00-23.50
St. Louis	†20.00-20.50

STEEL CAR AXLES

Birmingham	18.00
Boston district	†18.00-18.50
Chicago, net	22.50-23.00
Eastern Pa.	25.00-25.50
St. Louis	†21.00-21.50

LOCOMOTIVE TIRES

Chicago (cut)	21.50-22.00
St. Louis, No. 1	†17.50-18.00

SHAFTING

Boston district	†18.50-19.00
New York	†19.00-19.50
Eastern Pa.	24.50-25.00
St. Louis, 1¼-3¾".	18.25-18.75

CAR WHEELS

Birmingham, iron	13.00
Boston dist., iron	†14.75-15.00
Buffalo, steel	23.00-23.50
Chicago, iron	18.50-19.00
Chicago, rolled steel	21.00-21.50
Cincin., iron, deal.	18.00-18.50
Eastern Pa., iron	21.00-21.50
Eastern Pa., steel	24.00-25.00
Pittsburgh, iron	20.50-21.00
Pittsburgh, steel	25.50-26.00
St. Louis, iron	17.25-17.75
St. Louis, steel	19.50-20.00

NO. 1 CAST SCRAP

Birmingham	15.50
Boston, No. 1 mach.	†16.50-17.00
N. Eng. del. No. 2.	14.50-14.75
N. Eng. del. textile	18.75-20.00
Buffalo, cupola	18.50-19.00
Buffalo, mach.	20.00-20.50
Chicago, agri. net	15.00-15.50
Chicago, auto net	17.50-18.00
Chicago, railroad net	16.00-16.50
Chicago, mach. net.	17.00-17.50
Cincin., mach. deal.	19.25-19.75
Cleveland, mach.	22.50-23.00
Detroit, cupola, net.	†17.00-17.50
Eastern Pa., cupola.	21.50-22.00
E. Pa., No. 2 yard	18.00
E. Pa., yard fdry.	18.00-18.50
Los Angeles	16.50-17.00
Pittsburgh, cupola	20.00-20.50
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	17.50-18.00
St. L., No. 1 mach.	19.00-19.50
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break.	†14.50-14.75
New England, del.	15.50-16.00
Buffalo, break	16.50-17.00
Cleveland, break, net	15.50-16.00
Detroit auto net	†17.50-18.00
Detroit break	†15.50-16.00
Eastern Pa.	20.00-20.50
Los Ang., auto, net.	13.00-14.00
New York break	†15.50
Pittsburgh, break	17.50-18.00

STOVE PLATE

Birmingham	10.00-11.00
Boston district	†11.00-11.50
Buffalo	16.00-16.50
Chicago, net	12.00-12.50
Cincinnati, dealers.	11.00-11.50
Detroit, net	†11.00-11.50
Eastern Pa.	15.50-16.00
New York fdry	†12.25
St. Louis	†12.00-12.50
Toronto dealers, net	12.00

MALLEABLE

New England, del.	21.50-22.00
Buffalo	23.00-23.50
Chicago, R. R.	21.50-22.00
Cincin. agri., deal.	16.00-16.50
Cleveland, rail	22.50-23.00
Eastern Pa., R. R.	22.00-22.50
Los Angeles	12.50
Pittsburgh, rail	24.00-24.50
St. Louis, R. R.	18.75-19.25

Ores

Lake Superior Iron Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	10.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mn.	nom.
North African low phos.	nom.
Spanish, No. African basic, 50 to 60%	nom.
Chinese wolframite, short ton unit, duty paid	$23.50-24.00
Scheelite, imp.	$25.00
Chrome ore, Indian, 48% gross ton, c.i.f.	$28.00-30.00

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	60.00
So. African, 50-52%	57.00
Indian, 49-50%	55.00
Brazilian, 46%	50.00-53.00
Cuban, 50-51%, duty free	71.00-73.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

Sheets, Strip

Sheet & Strip Prices, Page 82, 83

Pittsburgh—Sheet sellers report practically all the low priced material was delivered by July 1, although there is some tonnage on which no release has been received. Because there is so little of this material left, it is probable that most of it will be delivered at the contract price. Operations continue to move upward, although last week's total was cut considerably by the holiday period. Sheet mill output is moving better than the narrower strip tonnage. Neither product shows heavy backlogs, however. Automotive buying has not yet appeared in much volume, and there may be considerable holdup as a result of the interference of normal business from the defense program.

Chicago—Some expansion of buying is noted as volume, which had been small because of previous heavy coverages in April, has improved in the last ten days. Heavy shipments will be made in July, due to extension of shipping deadlines on low-priced tonnage and because increased automotive releases are coming in. Narrow strip material is moving in heavy volume. Carryover of low-priced tonnage after July 31 is uncertain, though some interests indicate not all orders can be shipped by then.

Boston — Buying of cold strip specialties appears to have leveled. While there has been no decline, bookings are more in line with production schedules at 70-75 per cent of capacity. While the accessory trade has placed considerable volume for relatively early third quarter delivery, main automotive consumers are slow to enter the market.

New York—Sheet specifications here this month probably will be light, due to the substantial releases last month prior to the deadline on contracts booked at concessions last spring. This tonnage is scheduled to be shipped by the end of July. Further, some consuming lines here will be off seasonally, although not as much as normally, as some manufacturers of household appliances, for instance, are endeavoring to build up a backlog of manufactured stocks in anticipation of considerable work a little later on for the country's defense program.

Philadelphia—Shipments of steel sheets for 1940 automobiles now are virtually completed. One steel company shipped the final lot for current models this week. Some steel has been shipped for 1941 cars but heavy movement is not likely to get under way as soon as expected due to large inventories of cars in dealers' hands.

Buffalo—With huge order backlogs, sheet and strip production will get back on a five-day capacity basis this week. Heavy industrial consuming sources are actively placing releases.

Cincinnati — Sheet mill books are fairly well filled for July and broad buying for third quarter continues. Prospects for better operations on galvanized sheets are considered good. Export interest has diminished. Production figures for last week were lower on account of the holiday, extended in one mill.

Birmingham, Ala. — Sheet mill operations hold steady, with output now at approximately 90 per cent of capacity. While a large part of the sheet output is roofing, a considerable tonnage of manufacturers' sheets also is being produced. Most of the strip output is cotton ties.

St. Louis—Buying of sheets and strip has declined from recent levels, due largely to the fact that most im-

portant users have covered requirements. Specifications, however, continue large, total releases during June being larger than in May by about 12 per cent. Bookings are better for roofing material and galvanized sheets through the general manufacturing trade.

Toronto, Ont.—Sheet demand continues high, due to the sharp gain in war contracts for motor vehicles and various other war supplies. The automotive industry is reported to have placed record contracts for third quarter and Canadian mills are booked almost solid to the end of September. In addition a large overflow of business is said to be going to United States producers for quick delivery. Canadian mills are running at capacity to meet demand and officials state no sheets are available for spot delivery, while contract deliveries are now almost to the end of September.

Plates

Plate Prices, Page 82

Chicago—Plates now are among the most active of steel commodities. Recent improvement has been furthered by increased demands noted in connection with bridge work and railroad repair requirements. Heavy plate demand continues from the petroleum industry, storage tank fabricators, heavy machinery makers, and, indirectly, for a number of government needs.

Boston — Walsh-Holyoke Steam Boiler Works, Holyoke, Mass., will fabricate 1500 tons of 48-inch welded steel pipe for the metropolitan district commission, Boston, the largest specified project in some time. Miscellaneous buying continues to improve gradually and shipyard specifications are maintained with additional tonnage about to be placed with Eastern Pennsylvania mills. The Worcester district car shop is more active with plate and sheet requirements heavier. Boiler and structural fabricators continue to lag, but show some scattered improvement in buying.

New York—While plate deliveries are easily available in about two weeks eastern mill production is expanding and backlogs are steadily accumulating. Some producers believe that with the ordinary daily business which they have reason to expect, they will have no difficulty, in view of these backlogs, in maintaining output at a high rate throughout the quarter. While ship work constitutes the principal backlog for most mills along the eastern seaboard, there is an improvement in miscellaneous demands and particularly in railroad requirements.

Philadelphia—Plate demand generally is gaining momentum as indicated by mill backlogs. Some independents can still promise deliveries within 10 days but larger interests can do no better than three to four weeks.

Pennsylvania railroad is taking in material against its car repair program as fast as shipments can be made and some specifications, it is understood, have been made against its new car program. Substantial releases of ship plates are reported against work now under way and it is also indicated that some steel is being rolled against requirements some months hence. Contracts for replacement boilers for destroyers now being recommissioned have been placed with local shops, it is understood.

Birmingham, Ala. — Plate backlogs continue to increase as the result of tonnage from tank manufacturers, shipbuilders and railroads. These three major consumers, with miscellaneous demand, are responsible for a consistently large tonnage.

Seattle — Shops have resumed operations after a six-week strike and face a fair backlog, mostly in small jobs. No large projects are up for immediate action. Bonneville project, Portland, Oreg., has called bids July 12 for construction of six 10,000-gallon oil storage tanks, for Napavine, Wash., Spec. 1168, tonnage unstated.

San Francisco—Bids have been taken on 214 50,000-gallon tanks under invitation 950-40-349 for delivery in the Hawaiian Islands, Alaska and the Panama Canal. The total requires 5350 tons with 2200 tons designated for Honolulu and Alaska. During first half awards were nearly double those for the same period in 1939, 33,997 tons being placed this year and only 18,084 tons last year.

Toronto, Ont. — Plate demand shows indications of further expansion as a result of ship contracts placed during the past week totaling approximately $10,000,000. However, it is expected that a large part of this business will go to United States producers as Canadian plate production has been booked solid to the end of the year. Large orders also are pending for armor plate for construction of tanks, for which contracts for some 300 have just been placed by the Department of Munitions and Supply, Ottawa.

Plate Contracts Placed

1500 tons, 10,625 linear feet, 48-inch steel pipe, West Roxbury district (Boston) to Walsh-Holyoke Steam Boiler Works, Holyoke, Mass.; Edward M. Matz Inc., Boston, contractor; bids June 20 to metropolitan district commission, water division, Boston.

Unstated, 200,000-gallon steel tank, naval air base, Pensacola, Fla., to R. D. Cole Mfg. Co., Newnan, Ga., through Boyd & Goforth Co., Charlotte, N. C.

Bars

Bar Prices, Page 82

Pittsburgh — Inquiries for bars for export continue to flow in. Domestic demand has tapered slightly, although new orders are still substantial. Backlogs are growing in most cases, with jams beginning to form on the more popular sizes. Cold-finished divisions report considerable new business, particularly for export. Concrete bars are moving fairly well, with 1.90c price reported holding in all sections. New construction inquiries are numerous.

Chicago — Demand is unusually good, continued improvement being noted at a number of mills. Some producers find carbon and alloy bars constitute largest part of present demand. Deliveries on the more common forms and sizes run five to six weeks, a leading interest reports, with users chiefly concerned with placing business where most prompt deliveries can be obtained.

Boston—Demand and consumption of alloy bars continues to broaden with deliveries on some specialties slipping further. Government shops, increasing operating schedules, have closed on better than 1000 tons recently. Machine tool and shipyard demand is well maintained and, with heavy backlogs, will be strong for many weeks. Larger consumers are covered well in advance as are most secondary sellers and specifications against such orders are expanding.

New York—Carbon bar shipments now range from five to six weeks in most cases; cold drawn bars, around five weeks; alloy bars, seven to nine weeks; and heat treated alloy bars, 15 weeks and beyond. Allowing for a setback this week owing to holiday influences, specifications generally are expanding. Machine tool requirements continue outstanding with airplane equipment manufacture and government shop releases heavy, particularly in point of dollar value. Railroad requirements have shown a spurt.

Philadelphia — Consumers report difficulty in obtaining quick shipments on special items in bars, such as irregular sections, highly finished carbon material, heat-treated bars and the like, inasmuch as mills are more active on standard grades and are therefore unwilling to make frequent roll changes. Deliveries on

alloy bars now are extended as much as nine weeks and carbon grades four to six. Requirements of most classes of consumers are increasing including government arsenals, machine tool makers, ship and car builders, bearing makers, etc.

Birmingham, Ala.—Some increase in activity by manufacturers of agricultural implements has resulted in correspondingly better demand for bars. Deliveries are consistent and bookings are fairly well abreast of current output, with some backlogs still on the books.

Buffalo — Except for the holiday shutdown bar mill rolling schedules are maintained at capacity. Backlogs are substantial despite full production schedules for the past month. Buying interest is widespread among practically all leading consuming sources except the structural industry.

Toronto, Ont. — Bar demand showed further improvement during the week and much higher demand is expected as the placing of war contracts is increased under the new plans announced by the Canadian and British governments. Toolmakers are operating at capacity and demands from this quarter are at record breaking level.

Pipe

Pipe Prices, Page 83

Pittsburgh — New pipe business is leveling off, with incoming releases and new buying holding at about the same level as the preceding week. Standard pipe is the most active item, although there has been good demand for mechanical tubing and particularly for specialties, mainly aircraft tubing. Prices are steady and deliveries remain the prime consideration. Jobbers are attempting to build up stocks but so far demand has kept pace with their increased buying.

Boston — Demand for merchant steel pipe and mechanical tubing tends upward, notably the latter for aircraft and miscellaneous industrial production. While new orders are small, they are more numerous and releases against coverage is maintained. Cast pipe volume continues subnormal, both as to buying and releases against blanket contracts.

Seattle — Inquiry is slow for cast iron pipe, current sales involving small tonnages out of stock. Seattle will call bids soon for two local improvements, tonnage unstated. H. G. Purcell, Seattle, will furnish system supplies for Elma, Wash. Pyallup, Wash., opens bids July 10, for 35 tons 4 and 6-inch cast iron pipe and about 3000 feet of 1 to 2-inch galvanized pipe.

Birmingham, Ala. — Pipe production remains on a five-day basis, in the larger shops. Bookings, mostly from municipal and utility sources, are mainly for smaller sizes, with some scattered government contracts. Inquiries are somewhat heavier.

San Francisco — Awards of cast iron pipe during first half are only slightly below the total for the same period in 1939. Bookings to date aggregate 15,679 tons, compared with 16,922 tons for the corresponding period last year. San Bernardino, Calif., divided 327 tons of 4 to 12-inch, Class 250 pipe between United States Pipe & Foundry Co., American Cast Iron Pipe Co. and National Cast Iron Pipe.

Steel Pipe Placed

140 tons, 31½-inch, District of Columbia, to Maryland Culvert Pipe Co., Baltimore.

Steel Pipe Pending

Unstated, 50,000 feet or more, 3 to 6-inch,

district 45, King county, Wash.; bids July 8.

Cast Pipe Placed

327 tons, 4 to 12-inch, San Bernardino, Calif., divided between United States Pipe & Foundry Co., Burlington, N. J., and American Cast Iron Pipe Co. and National Cast Iron Pipe Co., both of Birmingham, Ala.

Cast Pipe Pending

510 tons, 6-inch, San Francisco; Central Foundry Co., low.

149 tons, 14-inch, Sumner, Wash.; city purchased transite pipe.

Wire

Wire Prices, Page 83

Pittsburgh — Wire mills report new export demand in heavy volume, principally in manufacturers' products, although a fair volume of merchant items has been taken. Domestic business is tapering slightly, principally because of the off-season for merchant wire items. Some buying has been for stocking purposes, most manufacturers trying to protect themselves as far as possible from the expected shortage when defense needs begin to come out in heavy volume.

Chicago — Slight gains have been noted in wire and wire products demand, with rural demand and road-building mesh somewhat improved. Much heavier automotive demand is awaited from spring and partsmakers and a large part of this is expected to start materializing toward the end of this month and in early August.

New York — Wire buying continues ahead of shipments and backlogs are increasing. Demand is well diversified and some consumers are building reserves.

Birmingham, Ala. — All specifications in wire products are in good demand, particularly fencing, barbed wire and nails. Reports are heard of considerable government business in wire for this district, and backlogs, with current bookings, are sufficient to keep production near capacity.

Rails, Cars

Track Material Prices, Page 83

June freight car awards totaled 7475 units, including 2545 placed by the Pennsylvania with its own shops. This brought the total for first half to 16,173, the largest first half since 1937. The June total was the largest for any month since October, 1939, and except for that month and September, 1939, the largest month since April, 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
6 mos.	16,173	9,532	8,021	45,985
July	.....	110	0	1,030
Aug.	.....	2,814	182	1,475
Sept.	.....	23,000	1,750	1,216
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

July starts out well in car buying, Chesapeake & Ohio distributing 1000 all-steel box cars and 100 steel cabooses among seven builders.

Atchison, Topeka and Santa Fe is inquiring for ten steam locomotives, in addition to two 5400-horsepower diesel-electric road engines noted as placed last week. The Pennsylvania has awarded 2545 freight cars and 25 tenders to its own shops.

British purchasing commission, New York, is said to have placed 112,000 tons of 90-pound rails for quick railroad repair in case of bombing, to be delivered by August

15. Half the tonnage is said to have been taken by a Pittsburgh producer.

Car Orders Placed

Chesapeake & Ohio, 1000 fifty-ton box cars, as follows: American Car & Foundry Co., St. Louis shops, 300; General American Transportation Corp., East Chicago, Ind., 200; Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., 200; Pullman-Standard Car Mfg. Co., Michigan City, Ind., 200; Greenville Steel Car Co., Greenville, Ind., 100; also 50 steel cabooses each to St. Louis Car Co., St. Louis, and Magod Car Corp., Passaic, N. J.

Pennsylvania, eight-car streamlined train, reported placed with Edward G. Budd Mfg. Co., Philadelphia.

Pennsylvania, 2545 freight cars and 25 tenders, to own shops; includes 2100 gondolas, 225 covered hopper cars, 200 caboose cars and 20 flat cars.

Wabash, five covered hopper cars, to American Car & Foundry Co., New York.

Western Alabama, two baggage-express cars to American Car & Foundry Co., New York.

Car Orders Pending

Atlantic Coast line, 600 fifty-ton, forty-foot steel box cars, 100 fifty-ton, fifty-foot six-inch box cars and 100 seventy-ton phosphate cars.

Rail Orders Placed

Wabash, 2000 tons 112-pound rails, divided between Carnegie-Illinois Steel Corp., Chicago, and Inland Steel Co., Indiana Harbor, Ind.

Locomotives Pending

Atchison, Topeka & Santa Fe, ten 4-8-4 type steam locomotives, bids asked; in addition to two diesel-electric freight engines just placed.

Shapes

Structural Shape Prices, Page 82

Pittsburgh — Although volume is somewhat less than a week ago, placement of structural and plate contracts is fairly heavy. Inquiries are still good and the industrial expansion, largely due to the national defense program, continues to bring out considerable tonnage. Public jobs are still much in evidence. Plate mills report no visible decline in backlogs.

Chicago—Sales volume holds recent gains noted the previous week when orders increased considerably. Market has more than the usual number of small tonnages pending currently, bolstered by a number of more substantial projects. Fabricators find railroad requirements for bridge repairs increasing. Plant expansion needs are confined mostly to a small number of large-sized jobs.

Boston — Shipyard expansions at Bath, Me., and Groton, Conn., with others planned at navy yards, including Portsmouth, N. H., require several thousand tons. These, with naval and air station bases, plus continued industrial expansion bring structural steel activity to the high point of the year. Bridges and other public work outside the scope of defense plans are fewer.

New York—Contracts for close to 16,000 tons for the Long Island railroad grade separation work are expected to be placed shortly but inquiry and awards are off slightly. Bids on the first contract for the Brooklyn-Battery tunnel, New York, are being asked, the work being for a shaft on the Brooklyn side, taking only a moderate tonnage.

Seattle — Fabricating plants have increased backlogs sufficient to carry them well into third quarter. Shapes for the naval air bases at Kodiak and Sitka, Alaska, will total 4000 tons, awarded in a blanket contract to Columbia Steel Co., by Siems-Drake-Puget Sound, Seattle, general contractor. Tacoma has awarded seven tall crossing and line transmission towers to Bethlehem Steel Co., 200 tons or more. For

Behind the Scenes with STEEL

Giddy'ap

■ It looks like the horse and buggy are coming back. The last Census of Manufactures in which carriage makers were ahead of motor car manufacturers was in 1904 when there were 77,882 wage-earners in all branches of the carriage and wagon bodies business. At that time there were only 12,049 auto workers. But things are looking up for the guys who lost their voices yelling, "Git a horse!" Production of horse-drawn vehicles tripled from 1931 to 1937 and employment increased 50 per cent. Put on your duster, Ma, and we'll hitch old Dobbin to the shay. The flivver's brakes are shot anyway.

Gold Rush

■ Item in the news last week: *There is gold in Georgia, but it costs more than a dollar to get a dollar's worth out.* This is not to be confused with any Project of a similar nature.

Rolling Mills

■ In 1916, of the country's 380 rolling mills, 58 were operated by steel consumers for their own use (including eight by horseshoe manufacturers). By 1939 only 14 of 375 were consumer-owned.

Rolling Stock

■ There are only three-fourths as many freight cars available in the country today as there were in 1932.

Introducing . . .

■ On page 77 this week under Industrial Equipment, Manning, Maxwell & Moore Inc. announces a new plastic safety gage cover in what appears to be a most usual manner. Actually, their news release was a classic, accompanied by two photographs that "dramatically" tell the story. One was a rather attractive girl but our choice was this little tike, whom we introduce here

as our inspiration and mascot. The name slips us at the moment but we never forget a face.

Off to War

■ The war inches closer and closer. From Montreal comes word that STEEL's editorial representative there finds it impossible to continue with us any longer. He writes (heroically, it seems to us): *I am volunteering for active service with an overseas regiment of the Canadian Army, and expect to put on uniform tomorrow.*

Take A Letter

■ Among infant industries dedicated to doing our disliked duties, include the We-Write-Your-Neglected-Letters Co. Letter-shy New Yorkers phone a few facts to Director Beatrice Mayer, who brews a personal letter a la carte, gracious, condoling, complaining, brimming with filial pity, or smoking with righteous fury.

Hedy & Wendell

■ George M. Gillen, of the world's largest plate mill (Lukens Steel Co. to you), laughingly writes that if STEEL's eastern manager, Emil Kreutzberg, looks like Willkie, then he's Hedy Lamarr. Well, maybe those mint juleps are giving us a peculiar hallucination but if it just lasts we'll be off to Coatesville with a twinkle in our eye.

SHRDLU

railroad track relocation at Kettle Falls, Wash., 178 tons are required, to be furnished by reclamation bureau.

San Francisco—Structural awards for first half are nearly 40,000 tons ahead of the total for the first half of last year. Bookings aggregated 4918 tons and brought the total to date to 107,008 tons, compared with 68,718 tons for the same period a year ago.

Birmingham, Ala. — Orders have shown material improvement in shapes. Fabricators are busy on bookings for public and private construction, although no outstanding projects are pending.

Toronto, Ont.—Structural steel fabricators report steady flow of new business with most companies having backlogs which will keep them busy for several months. Orders totaling some 3000 tons are pending from General Motors Corp. of Canada and Ford Motor Co. of Canada, in connection with proposed plant additions. Other industrial expansion programs involve upwards of 5000 tons for almost immediate closing, while for government and private building projects announced some 10,000 tons are in prospect.

Shape Contracts Placed

4000 tons, naval air bases at Kodiak and Sitka, Alaska, to Columbia Steel Co. (previously reported unstated). Siems-Drake-Puget Sound, Seattle, general contractor.

1750 tons, steel piling, State street subway section S-1-A, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

1600 tons, bottling plant, Acme Breweries Inc., San Francisco, to Herrick Iron Works, Oakland, Calif.

1400 tons, piling, bulkhead, naval air station, Pensacola, Fla., to Carnegie-Illinois Steel Corp., Pittsburgh, through Kansas City Bridge Co., Kansas City, Mo.

1300 tons, addition, Carpenter Steel Co., Reading, Pa., to Bethlehem Steel Co., Bethlehem, Pa., Reading Contracting Co. general contractor.

1200 tons, addition Vultee Aircraft Co., Los Angeles, 1000 tons to Consolidated Steel Corp., Los Angeles and 200 tons to Pennsylvania Iron & Steel Co., Los Angeles.

800 tons, baking plant building, National

Shape Awards Compared

	Tons
Week ended July 6	23,619
Week ended June 29	19,837
Week ended June 22	13,835
This week, 1939	21,143
Weekly average, year, 1940	18,362
Weekly average, 1939	22,111
Weekly average, June	18,059
Total to date, 1939	603,722
Total to date, 1940	495,761

Includes awards of 100 tons or more.

Biscuit Co., Denver, to American Bridge Co., Pittsburgh; William Tam mings, Denver, contractor.

650 tons, extension to building 242, for Aluminum Co. of America, Arnold, Pa., to American Bridge Co., Pittsburgh.

650 tons, state bridge 82-22-4, C-3, Detroit, to Bethlehem Steel Co., Bethlehem, Pa.

641 tons, new administration building, University of California, Berkeley, Calif., to Judson-Pacific Co., San Francisco.

535 tons, bridge FAP-2708-A(1), Bulloch-Screven counties, Georgia, to Virginia Bridge Co., Roanoke, Va.

510 tons, 1940 bridge requirements, Rock Island railroad, Chicago, to American Bridge Co., Pittsburgh.

450 tons, grade crossing elimination, route 23, section 8B, near Sussex, N. J., to Bethlehem Steel Co., Bethlehem, Pa., through Ell-Dorer Contracting Co., Irvington, N. J.

450 tons, including 270 tons of sheet piling, bridge at Sepulveda dam, Los Angeles, to Bethlehem Steel Co., Los Angeles.

400 tons, building, E. R. Squibb & Sons Co., Brooklyn, N. Y., to American Bridge Co., Pittsburgh, through Turner Construction Co., New York.

360 tons, viaduct, U. S. route 7, Wilton, Conn., to American Bridge Co., Pittsburgh.

340 tons, state bridge SA-10-A, section 10-1F, Powerton, Ill., to Clinton Bridge Works, Clinton, Iowa.

338 tons, subway station and portal section D-6-E, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

300 tons, building, for Marshall Field estate, Chicago, to Midland Structural Steel Co., Cicero, Ill.

280 tons, state bridge RC-40-29, Raymondville, N. Y., to American Bridge Co., Pittsburgh.

275 tons, new Great Northern building, Chicago, to Midland Structural Steel Co., Cicero, Ill.

265 tons, state highway bridge, Hennessey, Okla., to Tulsa Boiler & Machinery Co., Tulsa, Okla.

260 tons, extension to office buildings, for Michigan Bell Telephone Co., Detroit, to Whitehead & Kales, Detroit.

260 tons, swing span, project FAS-65-A (1) Cocoa, Fla., to Nashville Bridge Co., Nashville, Tenn.

250 tons, beef house, for Armour & Co., Kansas City, Kans., to Kansas City Structural Steel Co., Kansas City.

250 tons, addition, Douglas elementary school, Chicago, to New City Iron Works, Chicago.

235 tons, 19 transmission towers, Illinois Northern Utilities Co., Freeport, Ill., to Aermotor Co., Chicago.

225 tons, eastern branch plant, United States Electrical Motors Inc., Milford, Conn., to Belmont Iron Works, Eddystone, Pa.; Leo F. Caproni, New Haven, engineer.

205 tons, bridges 359 and 356, Stanford, Mont., for Great Northern railway, to American Bridge Co., Pittsburgh.

200 tons, bridge FA-352-D(1) Jackson county, Missouri, to Omaha Steel Works, Omaha, Nebr.

200 tons, plant addition, U. S. Gypsum Co., Southard, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

200 tons, or more, seven tall transmission towers at Tacoma, Wash., to Bethlehem Steel Co., Seattle.

200 tons, building, Jacobs Aircraft Corp., Pottstown, Pa., to Bethlehem Steel Co., Bethlehem, Pa., F. H. Kaiser, Pottstown, contractor.

188 tons, steel piling, state highway bridge, Safford, Ariz., to Bethlehem Steel Co., Bethlehem, Pa.

180 tons, Dearborn street project, contract D6E, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

160 tons, warehouse, for Detroit Gasket & Mfg. Co., Detroit, to Gabriel Steel Co., Detroit.

155 tons, factory building, for York Safe & Lock Co., York, Pa., to Pittsburgh Bridge & Iron Co. Pittsburgh.

155 tons, dormitory and library, Washington and Lee University, Lexington, Va., to Virginia Bridge Co., Roanoke.

150 tons, building additions and alterations, Haughton Elevator Co., Toledo, O., to Donovan Iron Works; J. H. Berkebile & Son, Toledo, general contractor.

150 tons, for American Truck Co. terminal at Cincinnati, to Bethlehem Steel Co., Bethlehem, Pa., through Frank Messer & Son, general contractor, Cincinnati.

147 tons, Louise street bridge, Glendale, Calif., to Consolidated Steel Corp., Los Angeles.

145 tons, housing project, Lexington, Ky., to International Steel Co., Evansville, Ind.

140 tons, state bridge FAS-37-A, Pearl City, Ill., to Clinton Bridge Works, Clinton, Iowa.

140 tons, armory, Vineland, N. J., to Ornamental Iron Works, Newark.

130 tons, repairs to bridge 11/46 over Broad street, Philadelphia, for Central railroad of New Jersey, to American Bridge Co., Pittsburgh.

125 tons, repairs, bridge 11/46, Central Railroad of New Jersey, Elizabeth, N. J., to American Bridge Co., Pittsburgh.

125 tons, buildings 76, 77, 78 and 79 for the Mathieson Alkali Works, Niagara Falls, N. Y., to R. S. McManus Steel Construction Co. Inc., Buffalo.

115 tons, Mt. Vernon memorial bridge, Washington, to American Bridge Co., Pittsburgh.

115 tons, factory building, for Marmon-Herrington Co., Indianapolis, Ind., to Central States Bridge & Structural Co., Indianapolis.

110 tons, bridge, for Illinois Central system, Millington, Tenn., to American Bridge Co., Pittsburgh.

110 tons, bear trap repair parts, locks 12 and 13, Ohio river, Neville Island, Pittsburgh, for army engineers, to Hunter Steel Co., Pittsburgh.

100 tons or more, shop addition, New Britain Machine Co., New Britain, Conn., to Berlin Construction Co., Berlin, Conn., (shapes) and C. S. Mersick & Co., Bridgeport, (bars); Morton C. Tuttle Co., Boston, contractor.

Shape Contracts Pending

5000 tons, four depot supply buildings, Albrook Field, Canal Zone; bids July 10.

4500 tons, depot supply building, Hill Field, Ogden, Utah; Peter Kiewit & Sons Co., Omaha, Nebr., low on general contract at $711,711.

4000 tons, 44 ammunition magazines, Savanna, Ill., for U. S. government.

3320 tons, (also 126 tons cast steel), Kettle river bridge, Columbia river; bids in to Denver.

2260 tons, buildings, for Aluminum Co. of America, Los Angeles.

1325 tons, additional story, United States navy munitions building, Washington; McCloskey & Co., Philadelphia, low.

1000 tons, mill buildings, for Mead Corp., Chillicothe, O.

1000 tons, lift bridge, Kansas City Southern railroad, Beaumont, Tex.; bids July 15.

800 tons, extension to power station, for Connecticut Power Co., Stamford, Conn.

550 tons, extension to building, for Harrison Radiator division, General Motors Corp., Lockport, N. Y.

525 tons, apartment house, for Shroder & Koppel Corp., New York.

400 tons, airplane landing mats, Langley Field, Va., for United States government.

350 tons, alterations to building, for Consolidated Edison Co., New York.

350 tons, five state highway bridges, Wisconsin; bids July 9.

334 tons steel sheet piling, (also 50 tons reinforcing), flood wall Portland stockyards; F. S. Montague, Portland, low to United States engineer.

325 tons, A. C. photo and clerical school, Denver, Colo., for United States government.

300 tons, Strong hospital building, for Rochester university, Rochester, N. Y.

300 tons, shop building, Aberdeen, Md., proving grounds; bids July 9.

275 tons, addition to postoffice, Philadelphia.

250 tons, state highway bridge, Smithville, Minn.; bids July 12.

250 tons, building, for National Biscuit Co., Syracuse, N. Y.

225 tons, grade separation bridge, Detroit, for state.

200 tons, addition to court house, Smethport, Pa., for McKean county.

200 tons, bascule bridge, Rehoboth, Del.; bids July 25.

195 tons, overpass, Cape May county, New Jersey, for state.

180 tons, alterations to office building, for Insurance Co. of North America, New York.

178 tons, relocating Great Northern tracks, Kettle Falls, Wash.; J. A. Terteling & Sons, Boise, Idaho, low to reclamation bureau which will supply materials.

150 tons, state bridge over Weber river, Ogden, Utah.

140 tons, central heating plant, Chicopee Falls, Mass., for United States government.

135 tons, repairs to viaduct, Richmond, Va., for Chesapeake & Ohio railway.

130 tons, additions to building, for Mine Safety Appliance Co., Pittsburgh.

125 tons, state bridge, Wadhams, Mich.

110 tons, office and warehouse, for Kraft Cheese Co., Cleveland.

100 tons, administration building, Tasker street housing project, Philadelphia; bids July 23.

100 tons, high school, Ridley Park, Pa.; bids July 15.

100 tons, piling, repairs, jetties, Rehoboth, Del.; bids July 9 to United States engineer, Philadelphia.

Unstated, 27-ton gantry crane for Coulee gates; bids to Denver July 23.

Unstated, lifting frames and gates, Coulee dam, Spec. 1381-D; bids to Denver, July 15.

Unstated, slide and stem gates and hoists, Roza project, Washington state; bids to Denver July 16, spec. 1380-D.

Reinforcing

Reinforcing Bar Prices, Page 83

Chicago — Total pending tonnage shows slight expansion, with most requirements for small lots, though several substantial tonnages also are outstanding. Recent awards have been slightly more numerous and in some quarters, inquiries are appreciably increased. Prices are reported firmer than usual, though some irregularities still exist.

Boston — Outstanding reinforcing steel purchase includes 2000 tons of rods for reinforced concrete pipe, 48-inch, for water mains, Hartford, Conn., placed by Lock Joint Pipe Co., Ampere, N. J., contractor, at $939,305.50. Small-lot awards are more numerous and inquiry, exclusive of bridge and highway needs, which still lag, tends upward with housing projects at New Britain, Stamford, Conn., and Fall River, Mass., included. Prices are steadier, but still not firm.

New York—With fair volume of reinforcing bars being figured buying is light with small lots predominating. An increase to 2.15c, effective July 8, is being made. Inquiry has slackened with active grade crossing and highway projects taking about 3000 tons.

Philadelphia — Fabricators have been informed that the prices on bars will be advanced to 2.15c from 1.90c, effective July 8. Extras also are being increased. More work is noted.

Seattle — Third quarter prospects indicate an improved market, stimulated by expanded public spending. At the moment rolling mills are operating at about 50 per cent of capacity. Bethlehem Steel Co., Seattle, has a blanket contract to supply 3000 tons of reinforcing for the naval air bases at Sitka and Kodiak, Alaska, previously reported at 2000 tons. T. E. Connolly, San Francisco, has the award for the Cottage Grove flood control dam, Oregon, from United States engineer, involving about 300 tons of reinforcing.

San Francisco—While reinforcing bar letting were not large over 23,500 tons are now pending. Awards totaled 1232 tons, bringing the aggregate for the first half to 78,868 tons, compared with 86,138 tons for the corresponding period in 1939.

Toronto, Ont.—Demand for reinforcing steel is gaining steadily. Several large jobs have been announced in connection with war activities for which approximately 4000 tons of reinforcing steel will be required. Both mills and warehouse operators report continued heavy demand for reinforcing steel with large additional orders in prospect.

Concrete Bars Compared

	Tons
Week ended July 6	**1,765**
Week ended June 29	**10,500**
Week ended June 22	**12,073**
This week, 1939	**6,828**
Weekly average, year, 1940	**8,399**
Weekly average, 1939	**8,154**
Weekly average, June	**10,377**
Total to date, 1939	**279,125**
Total to date, 1940	**220,162**

Includes awards of 100 tons or more.

Reinforcing Steel Awards

1000 tons additional, Sitka and Kodiak, Alaska, naval air bases, to Bethlehem Steel Co., Seattle; Siems-Drake-Puget Sound, Seattle, general contractor.

280 tons, shipway No. 3, Philadelphia navy yard, to Taylor Davis Co., Philadelphia, through Duffy Construction Co., New York.

250 tons, bureau of reclamation, invitation B-38,314-A, Odair, Wash., to Bethlehem Steel Co., Seattle, Wash.

235 tons, bureau of reclamation, invitation B-38,311-A, Odair, Wash., to Bethlehem Steel Co., Seattle, Wash.

Reinforcing Steel Pending

350 tons, Cottage Grove dam, Lane county, Oreg.; general contract to T. E. Connolly, 461 Market street, San Francisco, at $769,930.

350 tons, warehouse, Lyon Van & Storage Co., Beverly Hills, Calif.; bids being taken.

282 tons, depot and supply building, Hill Field, Ogden, Utah; Peter Kiewit & Sons, Co., Omaha, Nebr., low on general contract at $711,711.

282 tons, relocation Great Northern tracks, Kettle Falls, Wash.; J. A. Terteling & Sons, Boise, Ida., low; materials by Reclamation bureau.

235 tons, gate house and other buildings, naval air base, Alameda, Calif.; Moore & Roberts, 693 Mission St., San Francisco, low on general contract at $427,324.

166 tons, Boise irrigation project; bids to bureau at Boise, July 24; materials by bureau.

150 tons, Alpine dam enlargement, San Rafael, Calif.; bids July 29.

150 tons, addition state college library, San Diego, Calif.; bids July 23.

150 tons, housing project, Beverly, N. J.; bids July 25.

Pig Iron

Pig Iron Prices, Page 84

Chicago — Releases tapered last week and market was quieter due to the holiday. Sales, which already were slow, have almost entirely ceased except for occasional small-lot transactions. June increase in shipments over May was largest for some time. July shipments, according to present outlook, will hold fairly even with tonnage moved last month. In line with maintenance of foundry operations up till last weekend, shipments of by-product foundry coke were unchanged.

Boston—Pig iron deliveries and most consumers took practically all tonnage due them on second quarter contracts. Buying is slack, however, with consumption gradually increasing. Full effect of the national defense program is yet to be felt, but more indirect tonnage involved in armaments is appearing. While shipyards require more castings, this volume is narrowly distributed and few foundries in this district are getting shipyard work. Those making machine tool castings maintain operations. New substantial buying by textile mill equipment foundries has not appeared.

New York — While specifications are off considerably, due to vacations at a number of foundries, pig iron sellers look for an active month. Business with most foundries not only is well sustained, but actually increased in numerous instances. Casting demands are becoming increasingly diversified, although those from machinery builders are still dominant. As most consumers are covered for current quarter, with some, in fact, confident they have enough under contract to meet requirements for entire last half, orders will probably remain light for some time.

Philadelphia—According to leading sellers, pig iron prices will not be advanced for next quarter. Tonnage booked in June for third quarter was the heaviest for the month in many years and consumers appear to be well covered into early October. Heavy coverage and easiness in cast grades of scrap are said to be factors in the decision not to raise prices at this time. Consumption is holding well. Some export demand is noted from South America, including one lot of 400 tons. Movement to England against contracts is heavy. This country would buy 35,000 to 40,000 tons of low phos monthly but has been unable to purchase tonnage due to lack of ore.

Buffalo — Producers report substantial bookings for current quarter delivery. Production has held at 84½ per cent of capacity for more than a month with producers reporting no noticeable addition to reserve stocks.

Cincinnati — Demand for pig iron continues unabated, excepting for the holiday influence. June business was the best of the year and there is no indication the melt has slackened other than temporarily. Buying is light, important melters being covered for the quarter.

St. Louis—Renewal of specifying by all classes of melters during the last ten days of June resulted in marked increase in shipments, sufficient to make total for the month well ahead of May and the largest this year. New buying, however, is small, users apparently having covered requirements for third quarter and some for balance of this year, barring some unusual bulge in demand. The melt as a whole expanded during June, with most noticeable betterment in foundries which cast machine and engine parts.

Toronto, Ont.—Increased demand for merchant pig iron featured markets of the past week or two, largely due to booking for third quarter. Local blast furnace representatives state that third quarter contracts, while not numerous, are in better volume than for either of the two previous quarters. Spot demand has

been showing improvement with deliveries running upwards of 5000 tons per week. Basic iron is in better demand from melters in the Toronto and Montreal areas, holding at an average rate of about 500 tons per week.

Scrap

Scrap Prices, Page 86

Pittsburgh — Scrap markets are static, largely because of the holiday period. Buyers are not interested and offerings are fairly light. Recently closed railroad lists in adjacent districts indicate probable lower prices on most of this material soon. Steel sold in the Ohio district at 50 cents below last month's closings, broker prices, which indicates this material will probably bring lower prices in the consumer market. Until the lists close next week there will probably be little activity. Brokers here do not expect much interest until after July 15.

Chicago — Sentiment improved somewhat, early last week, but toward week's end the market quieted and dealer-broker transactions were reported at slightly lower levels. No. 1 steel remained quoted at $17.50 to $18, based on the last mill sale at the latter figure, though brokers were able to obtain material down to $17.25. Many prices became more nominal due to uncertainty of the post-holiday trend. Busheling, forgings, locomotive tires, and leaf springs were somewhat easier.

Cleveland — Large consumers continue out of the market although shipments on contract are steady. Water arrivals from upper lakes are frequent. Railroad lists have strengthened the market, some heavy melting steel selling into the Valley at about $20.50 and to the Pittsburgh area at $2 higher. Specialties brought about the same as a month ago.

Boston — Considering high steel works operations and fairly substantial foundry schedules, scrap buying is notably slow. Prices have weakened further on several grades although the declines are less sharp than at the start of the break two weeks ago. Machine shop turnings for eastern Pennsylvania are off 50 cents and heavy melting steel for that district has weakened, which is influencing export quotations for dock delivery. Cast and blast furnace material are steadier.

Philadelphia — Several scrap grades are quoted lower but it is believed that the decline has about ended. British ministry of shipping has eliminated a number of ports as sources for scrap in this country with the result that movement from Philadelphia this month will run at least 20,000 tons. Philadelphia was retained on the list due to excellent loading facilities at Port Richmond. No. 1 steel for export now is bringing $17.50, Port Richmond, No. 2 material $16.50.

Buffalo—Nominal weakness and less bullish sentiment is in evidence, but no sales have been made to warrant prices below the prevailing range of $19 to $19.50 for No. 1 steel. Dealers report ample offerings to cover recent large sales. A steady stream of barges is also arriving here with scrap originally slated for export to Europe.

Detroit—Scrap has turned definitely "sloppy" and prices are off on the average 50 cents per ton, with the exception of borings, No. 1 cupola cast and new heavy auto cast. Unsettlement caused over reports of a termination of war in Europe has reacted to make the outlook bearish, although no signs appear of any break in the high rate of steelmaking operations.

Extension of 1940 automobile production in a few cases may result in a larger tonnage of scrap in July than had been anticipated, but by July 15 most plants will have concluded current runs.

Cincinnati — The iron and steel scrap market continues soft, with dealers' prices 50 cents lower on most items. These cuts have not halted efforts of some dealers, retreating from their recent speculative position, to lighten inventories. Mills and foundries are temporarily out of the market.

St. Louis—Affected by freer offerings and bearish sentiment at other centers, the market for scrap iron and steel has drifted lower. Quotations on a number of grades are lower, the declines ranging from 50 cents on No. 2 heavy melting steel to $1 on brake shoes. Cast grades and malleable are relatively firm. Country offerings have increased. Railroads are also disposed to market scrap more freely. An east side mill purchased 6000 to 7000 tons of No. 2 heavy melting steel at a reported $15.50, delivered. Otherwise buying was confined to small lots.

Birmingham, Ala. — The scrap market has moderated considerably in the past few days, with a great deal of tonnage reported coming out. Prices are unchanged.

San Francisco — Heavy melting steel and compressed sheets have been advanced 50 cents a net ton, delivered metropolitan areas of San Francisco and Los Angeles, f.o.b. cars. No change has occurred in turnings and borings. Dealers buying prices have also advanced and are quoted at $11.00 to $11.50 a net ton, delivered yards, with No. 2 at $10.00 to $10.50 a net ton.

Seattle — The market has developed some weakness, export scrap having declined $1 to $2 from the high of 30 days ago, present prices

quoted at $15 and $13.50 to $14 for No. 1 and No. 2, respectively. Mills are out of the market although buying occasional lots from dealers. Export demand is off but Japan continues to place small orders. Trans-Pacific space is easier, a full cargo charter for Japan being reported at $14.25, free in and out, against a high of $17.50 freight paid two months ago.

Toronto, Ont.—Iron and steel scrap sales continue at record breaking levels, with practically all types of melters showing keen interest. Local dealers state that large tonnages of scrap are appearing and no shortage in the more popular lines is anticipated for some time. In addition imports from the United States during May totaled almost 50,000 tons, the highest level on record, local interests state. However, there was some falling off in imports in June, due to the advance in prices across the line. Booking for third quarter is underway, and dealers are making overtures to the large mill buyers in the hope of obtaining higher prices, but so far no announcement has been made regarding list revision.

Warehouse

Warehouse Prices, Page 85

Chicago — Business last week continued to expand fractionally over the previous week, though no substantial improvement has taken place since the third week of June. Distribution is decidedly wide, both as to products and sources of demand. Bars, light bar sizes and shapes, sheets and narrow strip continue most actively involved in current customer requirements.

Philadelphia—Jobbers report steel sales steady or a shade slower. However, buying is well diversified and improvement is expected shortly as indicated by the fact that inventories are being maintained close to maximum.

Buffalo—While distributors were disappointetd at June sales, compared with May, a mild flurry at the start of July did much to bolster sentiment. Diversified buying indicates support from the national defense program. Prices on galvanized sheets remain soft.

Detroit — Warehouse sales continue spotty, but volume is holding up well with preceding weeks. Outlook for July is vague, day-to-day business being almost unpredictable. In keeping with the mill situation, however, the undertone is firm and expectations point to an active summer.

Cincinnati — Warehouse sales slipped last week, attributed solely to the holiday. Tonnage for June surpassed that of May. Prices are firm and unchanged.

St. Louis—Preliminary reports are that warehouse volume in June exceeded that of May by approximately 12 per cent and was the largest so far this year. Purchasing was more diversified than heretofore, both as to commodities and users. The movement of materials to country distributors and machine shops developed improvement, and oil country goods of all descriptions continued active.

Seattle — Tone of the market is firmer although announcement of advance of 25 cents on shapes, plates and galvanized sheets, effective July 1, failed to produce buying for stock. Volume is satisfactory although cautious. All out-of-stock items are moving freely and the government's program seems to assure continued active business.

Ferroalloys

Ferroalloy Prices, Page 84

New York—With specifications last month the heaviest since September, the movement of ferromanganese in July will be off considerably, in the opinion of some trade leaders. This will also apply to spiegeleisen and other manganese alloys, ferrosilicon and certain specialties on which higher prices have recently gone into effect.

Ferromanganese is now holding at $120, duty paid, eastern seaboard on both spot and contracts; and spiegeleisen, 19-21 per cent, $36, Palmerton, Pa., and 26-28 per cent, $49.50. Actual consumption is increasing in most all leading alloys.

Steel in Europe

Foreign Steel Prices, Page 85

London—(*By Cable*) — Domestic prices on iron and steel products in Great Britain have been increased from July 1. Pig iron has been raised 9 shillings, billets £1 2s 6d and finished materials £1 8s 6d to £1 17s 6d. Pig iron output is increasing, especially basic hematite. Semifinished steel is now arriving from America, relieving the shortage for rerollers.

The government is ordering large tonnages of black and galvanized sheets. Shipyards are absorbing large tonnages of various steel products. Australia and South Africa have placed considerable tonnages of tin plates.

Tin Plate

Tin Plate Prices, Page 82

Pittsburgh—Tin mill operations are up slightly at 78 per cent of capacity, although holiday shutdowns have cut into the week's tonnage considerably. Sellers are considering the addition of mills now idle if demand develops as expected later this summer. Domestic packers are now releasing their placements on fair volume, and export business continues to climb. National defense plans include

heavy tin plate requirements and if this comes on top of current business, additional capacity will be necessary.

Iron Ore

Iron Ore Prices, Page 86

Cleveland—Shipments of iron ore from upper lake ports during July totaled 9,525,494 gross tons, compared with 7,244,549 tons in May and 5,572,998 tons in June, 1939. This is an increase of 3,952,496 tons over June, last year.

Cumulative tonnage to July 1 was 17,268,690 tons, compared with 9,231,249 tons to the same date last year, a gain of 8,037,441 tons.

Comparisons by ports for June are as follows:

	—Gross Tons— June, 1940	June, 1939
Escanaba	504,528	299,728
Marquette	837,484	466,718
Ashland	860,384	600,923
Superior	3,377,137	1,703,153
Duluth	2,138,566	1,265,441
Two Harbors	1,768,721	1,237,035
Total U. S. Ports	9,486,820	5,572,998
Michipocoten	38,674	.....
Total	9,525,494	5,572,998
Increase from 1939	3,952,496	.....

Comparisons by ports for the season to July 1, are as follows:

	Gross Tons— To July 1, 1940	To July 1, 1939
Escanaba	910,906	474,937
Marquette	1,605,249	854,901
Ashland	1,639,461	983,003
Superior	6,017,755	2,817,596
Duluth	3,813,304	1,964,484
Two Harbors	3,209,363	2,136,328
Total U. S. Ports	17,196,038	9,231,249
Michipocoten	72,652	.....
Total	17,268,690	.....
Increase from 1939	8,037,441	.....

New York — Caucasian manganese ore, 50-52 per cent, has been advanced 5 cents per unit to 60 cents, without duty, reflecting probably higher war risk insurance on shipments through the Mediterranean. Little new contracting is noted, with most current movement of Caucasian and other foreign manganese ore coming in against existing orders. Several cargoes are now in transit, the last reported shipment leaving Poti June 30.

Private industrial stocks in this country are said to be fairly large and individual consuming companies show little direct active interest, especially in view of heavy contemplated purchases by government agencies.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 83

New York—Due to holiday influences bolt and nut business this month has gotton off to a slow start. However, sellers are encouraged over prospects of better buying from the railroads and by fairly well sustained business from the building field.

Semifinished Steel

Semifinished Prices, Page 83

Pittsburgh — Local nonintegrated mills are taking semifinished material at a good rate, probably slightly better than their own operations. Export demand continues heavy and this added to the needs of the integrated mills themselves has created a fair backlog in semifinished material. American Steel & Wire Co., Donora, Pa., is installing a new blooming mill this week to increase capacity slightly in that plant. Wire rods and billets continue the most active items.

Shape Extras Revised; Drastic Changes Made

Pittsburgh — Extras on carbon steel structural shapes have been drastically revised in a new list dated July 1, 1940, issued by Carnegie-Illinois Steel Corp.

The list supplants that dated July 1, 1938, and includes many revisions, reclassifications and new listings. Size extra lists have been revised for exceptions to the standard angle and standard beam charge; size extra list of wide flange beams has been enlarged to include sizes as well as key numbers. Size extras on light beams, joists and stanchions have been revised and one new extra has been added to the carbuilding sections list. Split-beam size extras on CBL and CBS sections have been revised.

Item quantity extras have been substituted for the previous extras, the extra being determined by the total theoretical weight of the individual sections ordered of one grade or analysis, released for shipment to one destination at one time, based on the following schedule: Under 2000 to 1000 pounds, inclusive, 0.25. Under 1000 pounds, 0.50; the extra to apply whether or not the item is included in carload or less carload lots.

Length extras have been revised and new conditions added. Slight revision has also been made in special cutting extras. Additional specifications regarding camber have been written into the new lists.

Extras have been established for Federal Specifications QQS—75la. Charges have also been set up for protection of shipments from weather when specified and for deliveries where conditioning the surface by welding according to ASTM specifications is not permitted.

Equipment

Seattle — Market tone is better as federal funds are distributed, electrical, automotive and water system items being in best demand. Harnischfeger Corp., Milwaukee, has sold a 10-ton traveling electric bridge crane to the navy for the Puget Sound yard tinsmith shop. Reclamation bureau, Denver, has

called figures July 18 for furnishing twenty-three 150-kva distributing transformers for Coulee dam, Spec. 1383-D and July 24 for three outdoor type transformers, 38,600-kva and three 36,000-kva, for the Coulee power plant, Spec. 921. Bonneville project will receive tenders July 15 for five transfer cars, Spec. 1167; July 17 for conductor and accessories, Chehalis-Centralia 69-kv line, Spec. 1181. International Derrick & Equipment Co., Torrance, Calif., is low to same office for furnishing a five-ton traveling crane for Ampere station. Seattle opened bids June 28 for 92½ tons of bronze trolley wire, July 1 for 22,000 feet of copper tubing and July 9 for a 15-ton machinery trailer.

Gun Barrels to Midvale

New York — The Midvale Co., Philadelphia, has been awarded 1160 tubes (barrels) for 37-mm. automatic guns for the Watervliet, N. Y., arsenal at $369.60 delivered, bids June 13, spec. 953-40-700.

Nonferrous Metals

New York — Recent developments in the European war have further reduced this country's markets for nonferrous metals; losses in Europe not having been balanced by gains in other sections of the world. This has had a weakening influence on prices. Holiday influences restricted the volume of business.

Copper — Electrolytic copper sold at 10.87½c, Connecticut valley, last week by custom smelters while resellers booked business down to 10.75c and export copper slipped to 10.50c, f.a.s. This represented the first time since Sept. 1 that copper has sold under the 11-cent level. Red metal scrap eased to the basis of 9.25c for No. 1 heavy, or the equivalent of about 10.75c for refined metal derived.

Lead — Competition of foreign metal continues to exert pressure on the market here. Demand was light last week, partly due to observance of the holiday and partly to the well-covered position of consumers. Prices held at 4.85c, East St. Louis.

Zinc — Despite the recent advance to 67 per cent of capacity in galvanizing operations, temporarily reduced by holiday shutdowns, there has been no improvement in fresh demand. Prime western held at 6.25c, East St. Louis.

Tin—London and Singapore markets strengthened on the announcement that RFC had organized the Metals Reserve Co. for purchasing 75,000 tons of tin at 50.00c a pound, United States ports, to be held as a government reserve. The domestic market showed little reaction, however, with Straits spot easing from 52.50c on Monday to 52.00c at the close. Only light business was transacted here.

Nonferrous Metal Prices

June	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
29	*11.12½	11.50	10.75	52.25	50.00	5.00	4.85	6.25	19.00	14.00	35.00
July											
1	*11.12½	11.50	10.75	52.50	50.00	5.00	4.85	6.25	19.00	14.00	35.00
2	*11.00	11.50	10.75	52.25	50.25	5.00	4.85	6.25	19.00	14.00	35.00
3	*10.87½	11.50	10.75	52.00	50.25	5.00	4.85	6.25	19.00	14.00	35.00
4—Holiday											
5	*10.87½	11.50	10.75	52.00	50.25	5.00	4.85	6.25	19.00	14.00	35.00

*Based on sales by custom smelters; mine producers unchanged at 11.50c.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 11.50c Conn. copper

Sheets

Yellow brass (high)	18.56
Copper, hot rolled	20.12
Lead, cut to jobbers	8.25
Zinc, 100 lb. base	11.50

Tubes

High yellow brass	21.31
Seamless copper	20.62

Rods

High yellow brass	13.55
Copper, hot rolled	16.62

Anodes

Copper, untrimmed	17.37

Wire

Yellow brass (high)	18.81

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	6.87½-7.12½
Cleveland	8.00-8.25
Chicago	7.37½-7.62½
St. Louis	7.75-8.25

Heavy Copper and Wire

New York, No. 1	8.50-8.75
Cleveland, No. 1	9.00
Chicago, No. 1	8.62½-8.87½
St. Louis	8.75-9.25

Composition Brass Turnings

New York	6.50-6.75

Light Copper

New York	6.50-6.75
Cleveland	7.00
Chicago	6.62½-6.87½
St. Louis	6.75-7.00

Light Brass

Cleveland	4.25-4.50
Chicago	4.25-4.50
St. Louis	4.25-4.50

Lead

New York	4.50-4.60
Cleveland	3.90-4.15
Chicago	3.90-4.10
St. Louis	4.00-4.25

Zinc

New York	3.50-3.75
Cleveland	3.00-3.25
St. Louis	3.25-3.50

Aluminum

Misc., cast, Cleveland	8.00
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.00
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	12.00
Standard No. 12 aluminum	14.25-14.75

Baltimore Steel Club Holds Annual Outing

■ Fifth annual golf and dinner party of the Steel Club of Baltimore held at the Terra Mariae Country club June 28 was attended by more than 140 members and guests, with 72 participating in the golf tournament.

H. Rogers Dorney, Jones & Laughlin Steel Corp., president, presided at the dinner during which a plaque was presented to C. H. Michel, Maryland Metal Building Co., in recognition of his services to the club as president in the past year. Golf and special prizes were awarded. Charles S. Duvall, Maryland Belt & Nut Co., and Frank H. Carter, Maryland Dry Dock Co., past presidents, participated in the program.

Winners of the low gross and low net golf prizes respectively were F. G. Gerard, Eastern Rolling Mill Co., and Ray G. Scoggins, Jones & Laughlin Steel Corp., Greensboro, N. C. The high gross prize went to S. R. Machem, Baltimore Steel Co.

Recipients of the "kickers' handicap" prizes were W. E. Sturgis, Phoenix Bridge Co., Washington; T. G. Roberts, Philadelphia; Ben Hagberg, Bethlehem Steel Co.; J. F. Wiese, Lukens Steel Co., Coatesville, Pa.; W. H. Jennings, American Steel & Wire Co.; W. D. Bourguin, Republic Steel Corp.; Richard Angell, A. M. Byers Co., Philadelphia; R. W. Russell, Baltimore Steel Co.; H. Rodgers Dorney; John Zink, John Zink Heat & Power Co.; J. B. Coster, Bethlehem Steel Co.; J. A. Aufhammer, Bethlehem Steel Co.; J. A. Downey, Eastern Rolling Mill Co.; H. E. Miller, Carolina Steel & Iron Co., Greensboro, N. C.; C. W. Patterson, R. J. Taylor Co.; and H. W. Merriman, Alan Wood Steel Co., Philadelphia.

Winners of door prizes were Robert Price, Southern Supply Co.; H. E. Burkhardt, Hajoca Corp.; Howard Adams, Bethlehem Steel Co.; C. G. Stephens, Glenn L. Martin Co.; and C. E. Kendall, Jones & Laughlin Steel Corp., Pittsburgh. J. B. Coster was chairman of the committee on arrangements.

Pig Iron Production Up 67 Per Cent in 1939

■ Pig iron production in 1939, exclusive of ferroalloys, was 31,075,914 gross tons, an increase of 67 per cent over 1938, according to the bureau of mines, department of the interior, Washington. Of the total, 31,031,973 tons was made with coke fuel and 43,941 tons with charcoal.

Pennsylvania was the leading producer with 28 per cent of the total, Ohio was second, the two accounting for 51 per cent.

Production in 1939 consumed 51,160,340 gross tons of domestic iron and manganiferous ores, 2,262,043 tons of foreign ores, 3,735,132 tons of mill cinder and roll scale, 721,286 tons of purchased scrap, 1,004,565 tons of home scrap, and 1,737,000 tons of flue dust.

An average of 1862 tons of metalliferous materials, exclusive of home scrap and flue dust, were consumed per ton of pig iron made in 1939, compared with 1880 tons in 1938. Average consumption of ore per ton of pig iron made was 1719 tons in 1939, against 1742 tons in 1938.

Shipments of pig iron from blast furnaces amounted to 32,091,485 gross tons valued at $626,824,690 in 1939, an increase of 76 per cent in both volume and total value over 1938. General average value of all grades of pig iron at furnaces in 1939 was $19.53, compared with $19.61 in 1938.

Pig iron exports decreased to 177,024 gross tons in 1939 from 432,851 tons in 1938. Sweden and United Kingdom together took 73 per cent of the total, each accounting for 36.5 per cent. Imports of pig iron for consumption in 1939 totaled 38,592 tons, a gain of about 27 per cent over 1938.

Domestic ferroalloy production was 735,171 gross tons in 1939, an increase of 26 per cent over 1938. Shipments of all classes of ferroalloys amounted to 841,162 tons, valued at $76,156,588, an increase of 81 per cent in volume and 79 per cent in total value over 1938.

Bar Mill Wage Steady

■ Monthly settlement of bar mill wage base by Amalgamated Association of Iron, Steel and Tin workers and the Western Bar Iron association last week developed a card rate for July on boiling, bar and 12-inch mills at 2.15c; on guide and 10-inch mills, 2.25c, rates that have been unchanged since June, 1939.

■ May sales of household vacuum cleaners established a new record of 173,896 units for the month, an increase of 52 per cent above May 1939, according to Vacuum Cleaner Manufacturers' association, Cleveland. First five months sales this year totaled 786,775 units, an increase of 29.7 per cent above the same period 1939.

Construction and Enterprise

Ohio

AKRON, O.—General Tire & Rubber Co., 1708 East Market street, will build five-story factory building for shipping, receiving and warehousing, releasing space in present plant for one-third increase in production. Plans by R. Iredill, company engineer, Akron.

CLEVELAND—General Electric Co., Nela Park, E. J. Edwards, company engineer, is taking bids to July 10 for lamp factory building at Jackson, Miss., brick and steel, 140,000 square feet.

CLEVELAND—Midland Steel Products Co., 2085 West 110th street, is reported considering expansion to add 125,000 square feet to present plant, probably hinging on participation in federal armament program.

CLEVELAND—Forest City Foundries Co., 2500 West Twenty-seventh street, is building addition with 2700 square feet floor space for larger storage facilities.

CLEVELAND—Cleveland Electric Illuminating Co., Public Square, will double new capacity being provided at East Seventieth and Lake Front road, by installing second 60,000-kilowatt generator when work is completed on new building and installation of first generating unit. E. G. Crawford is president, W. H. Hartman purchasing agent and C. R. Nichols is in charge of engineering plans.

CLEVELAND—Wagner Rustproofing Co., 7708 Quincy avenue, operating a rustproofing and plating plant, is being incorporated with Jesse O. Wagner as president and will build an addition costing about $30,000 to enlarge capacity.

ELYRIA, O.—General Industries Co., Olive street, M. R. Smitgen, plant manager, is making two plant additions, likely to be followed by others. One will cover about 3200 square feet and a die storage building 600 square feet.

KENT, O.—Gougler Machine Co. will take bids soon on a one-story plant addition costing about $50,000.

SANDUSKY, O.—Farrell Cheek Steel Co., foot of First street, is building a machine shop 70 x 100 feet and a locker and shower room containing about 6400 square feet floor space. Carl Werner, 414 Forty-sixth street, is general contractor.

SPENCERVILLE, O.—Village, George Sowards, clerk, town hall, making plans for power plant improvements, including diesel or steam uniflow engine in new building. Cost estimated at about $65,000. W. E. Metzger, 48 Chatham road, Columbus, O., is consulting engineer.

TOLEDO, O.—Ransom & Randolph Co., 324 Chestnut street, has given contract to the Austin Co., 16112 Euclid avenue, Cleveland, for three-story plant 80 x 80 feet.

Connecticut

MILFORD, CONN.—United States Electrical Motors Inc., 200 East Slauson avenue, Los Angeles, will build a one-story 200 x 220-foot factory and power house here. L. F. Caproni, 1221 Chapel street, New Haven, is engineer. (Noted June 24).

New York

ELMIRA, N. Y.—Remington-Rand Inc., South Main street, will build a one-story plant addition costing about $40,000.

NIAGARA FALLS, N. Y.—Mathiesen Alkali Co. Inc., Buffalo avenue, E. M. Allen, president, will let contract soon for a plant addition.

TROY, N. Y.—Trojan Scrap Iron Corp., Division and Front streets, will build a 70 x 300-foot plant with crane runway, at total cost of more than $40,000.

New Jersey

BAYONNE, N. J.—International Aircraft Trading Co. Inc., 122 East Forty-second street, New York, will build a one-story airplane plant.

CALDWELL, N. J.—Wright Aeronautical Corp., 132 Beckwith avenue, Paterson, N. J., will build a one-story airplane parts factory at Caldwell-Wright airport. Albert Kahn, New Center building, Detroit, is engineer.

Pennsylvania

MEADVILLE, PA.—American Viscose Co., Meadville, will build a plant addition costing more than $40,000. Ballinger Co., 105 South Twelfth street, Philadelphia, is engineer.

Michigan

BAY CITY, MICH.—Dow Chemical Co., W. H. Dow, president, will build an 80 x 200-foot transite plant here, costing about $100,000.

DETROIT—Gagnier Printing Plate Co., 1326 East Congress street, has been incorporated with $1000 capital to manufacture electrotypes, stereotypes and similar products.

DETROIT—Keystone Metal Moulding Mfg. Co. has been incorporated with $10,000 capital to manufacture tools, machinery and moldings by Alexander Carlin, 4574 Hereford avenue.

DETROIT—American Brass Co., has awarded contract to J. A. Utley, Royal Oak, Mich., for alterations to its plant.

DETROIT—Aurora Oil & Gas Co. has let contract to R. E. Dailey & Co., Detroit, for group of refinery buildings at Schaefer road and Oakwood boulevard, Melvindale.

KALAMAZOO, MICH.—American Tool & Die Works Inc., 814 Ada street, has been incorporated with $7000 capital to manufacture tools and dies by Herman Weber, 609 Norton drive, Kalamazoo.

MARINE CITY, MICH.—Detroit Gasket & Mfg. Co., Detroit, will build an addition to its plant here, 100 x 300 feet. Plans are by H. D. Ilgenfritz, Detroit.

MUSKEGON HEIGHTS, MICH.—Shaw-Box Crane & Hoist Co. will build an addition costing $16,000. Strom Construction Co. has general contract.

Illinois

CHICAGO—U. S. Tobacco Co., 4325 Fifth avenue, will build a power plant 100 x 150 feet and install steam turbines, at Fifth and Kildare avenues, costing $150,000. R. B. DuVal, care owner, is engineer. Schmidt, Garden & Erickson, 104 South Michigan avenue, are architects.

DECATUR, ILL.—Illinois-Iowa Power Co., care P. M. Wheeler, 112 East Washington street, Monticello, Ill., will build a power plant addition near Decatur, costing about $200,000.

Indiana

ELKHART, IND.—Hart Pressed Steel Corp., 1801 South Fourteenth street, has been incorporated with 200 shares no par value, by Frank E. Hartnell, George Mossey and Charles W. Hahn.

Maryland

BALTIMORE—Rustless Iron & Steel Co., Biddle road and Edison highway, will build a one-story steel melting building 222 x 227 feet, general contract to Cummins Construction Co., 803 Cathedral street, Baltimore.

HAGERSTOWN, MD. — City council plans extensions and improvements to municipal power plant, including installation of new boilers and accessories. Wood & Kirkpatrick, Stock Exchange building, Philadelphia, are consulting engineers.

HAGERSTOWN, MD.—City will buy two boilers for the municipal electric light plant at cost of about $260,000.

District of Columbia

WASHINGTON—Potomac Electric Power Co., Tenth and E streets, N. W., has placed order for second 50,000-kilowatt generator for Buzzards Point plant, to be installed after present generator of same capacity has been completed. Company controlled by North American Co., Edward L. Shea, president, 60 Broadway, New York.

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids as follows: July 12, schedule 2123, motor-driven hand planer and jointer for Alameda, Calif.; July 9, schedule 2126, motor-driven pedestal grinder for Puget Sound, Wash.; July 12, motor-driven oil grooving machine for Mare Island, Calif.; July 9, schedule 2168, two motor-driven bolt and rivet forging machines for Norfolk, Va.; July 12, schedule 2173, motor-driven buffing machine for Mare Island, Calif.; July 16, schedule 2188, motor-driven sensitive floor-type drill for San Diego Calif.; July 9, schedule 2194, motor-driven horizontal punch for Brooklyn, N. Y.; July 9, schedule 2116, three motor-driven pedestal grinders for Mare Island, Calif.; July 9, schedule 2206, motor-driven pedestal floor type high-speed vertical precision tapping machine for Washington; July 12, schedule 2225, motor-driven cone-type hobbing gear cutting machine for Washington; July 16, schedule 2254, two hand-operated production type tube bending machines and spare parts for Boston.

Florida

DELAND, FLA. — Babcock Aircraft Corp., Fred L. Foster, president, plans erection of factory unit this fall at municipal airport, 80 x 260 feet, full-span steel construction; administration and engineering building and paint shop also planned.

Georgia

ATLANTA, GA.—City has taken bids on garbage and rubbish incinerator, Greenawalt Engineering Co., 135 East Forty-second street, New York, low at $648,000.

MARIETTA, GA.—Glover Mfg. Co., Boland Glover manager, may convert its plant to munitions production with capacity of 1000 shells per day, at cost of $400,000.

Virginia

STAUNTON, VA.—Augusta Co-operative Farm Bureau Inc. will build a refrigerator locker plant on 7-acre site, at cost of $20,000.

Missouri

NEVADA, MO.—City, L. M. Ewing, mayor, will hold election in August or September on bond issue for municipal light and power plant.

ST. LOUIS—Lambert Auto-Ordnance Corp. has been incorporated with Stafford L. Lambert president to manufacture automatic rifles, machine guns and projectiles. Plant will be located in St. Louis and manufacture of small arms will be undertaken first.

Wisconsin

APPLETON, WIS.—Outagami county highway committee will build a machinery storage building, 56 x 80-foot clear span single arch roof. Arnold Krueger, county highway commissioner.

RACINE, WIS.—Twin Disc Clutch Co., 1328 Racine street, is having plans drawn by Frank Hoffman, architect, 201 Sixth street, for a factory and office addition, one and two stories, with about 40,000 square feet floor area. (Noted June 10).

MILWAUKEE—Seaman Body Corp. division of Nash-Kelvinator Co., will build plant addition 150 x 216 feet, costing about $67,000 for storage. Permanent Construction Co. has general contract.

WISCONSIN RAPIDS, WIS.—Consolidated Power & Paper Co., will build a 40 x 40-foot boiler house. T. Utegaard, care owner, is engineer.

Texas

BROWNFIELD, TEX.—City, Clyde C. Coleman, will build one-story addition to powerhouse at municipal electric light plant, 57 x 60 feet and install 1200-horsepower convertible gas engine and generator, at cost of about $77,000. French & Pruitt Co., Abilene, Tex., are engineers. Bonds available to amount of $90,000.

BROWNSVILLE, TEX.—W. R. Davis & Co., Joseph Steal, general superintendent, in charge, is erecting two additional 80,000-barrel storage tanks. Later will erect other tanks and build refinery.

California

LONG BEACH, CALIF.—Air Transport Mfg. Co., E. L. Hollywood, president, is having plans prepared for an aircraft manufacturing plant at Dougherty field, this city. Structure to cover 30,000 square feet, costing $65,000.

LOS ANGELES—Harvill Aircraft Die Casting Co. has let contract to the Austin Co., 16112 Euclid avenue, Cleveland, for $200,000 welded rigid frame plant and office building.

LOS ANGELES—Sears, Roebuck & Co., 5525 South Soto street, is building a one-story warehouse 194 x 302 feet at cost of $100,000.

LOS ANGELES—Heller Aviation Equipment Co. has been organized to manufacture aviation parts and accessories, with 2000 shares no par value by E. L. Fielding, G. M. Shannon and H. R. Rayner, Los Angeles.

Washington

PULLMAN, WASH.—City has retained Stevens & Koon, Portland, Oreg., engineers, to design sewage treatment plant. E. B. Parker is mayor.

SEATTLE—Austin Co., Cleveland, has completed plans and will erect 55 x 78-foot boilerhouse at Boeing Aircraft Co. No. 2 plant, costing $15,000, to serve enlarged assembly plant now being built.

VANCOUVER, WASH. — Industrial Service Co., Orley Roberts, Portland, Oreg., president, plans construction of plant here to manufacture new type gas heating unit.

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WANTED: A DAY FOREMAN FOR A steel foundry; one with steel mill experience and also foundry experience on steel mill rolls. Apply Box No. 244, STEEL, Penton Bldg., Cleveland.

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Bids Wanted

Federal Works Agency, Public Buildings Administration, Washington, D. C., June 19, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., Standard Time, July 23, 1940, for the construction of the U.S.P.O. at Irwin, Pa. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings Federal Works Agency.

Bids Wanted

Federal Works Agency, Public Buildings Administration, Washington, D. C., June 25, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Standard Time, July 16, 1940, for construction (except elevator) of the U. S. P. O. and Court House at Fairmont, W. Va. Upon application, two sets of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $10 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

Federal Works Agency, Public Buildings Administration, Washington, D. C., June 24, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Standard Time, July 17, 1940, for alterations to the U. S. Court House at Philadelphia, Pa. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

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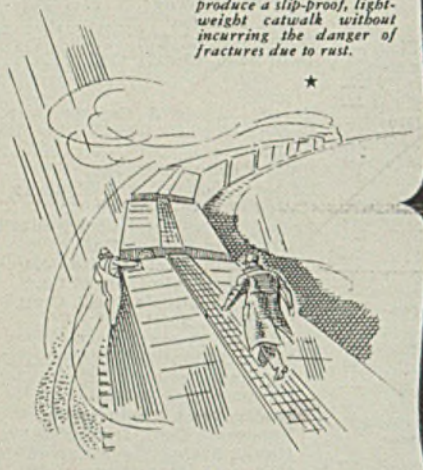

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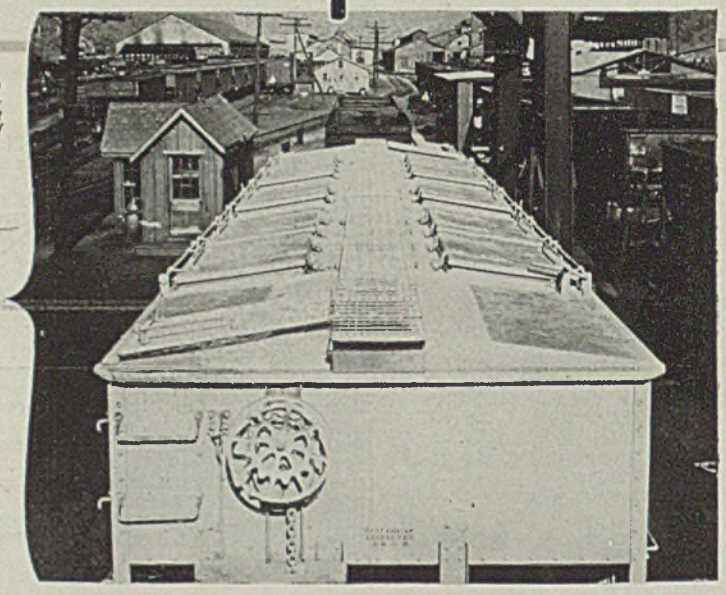

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