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STEEL

ESTABLISHED 1882

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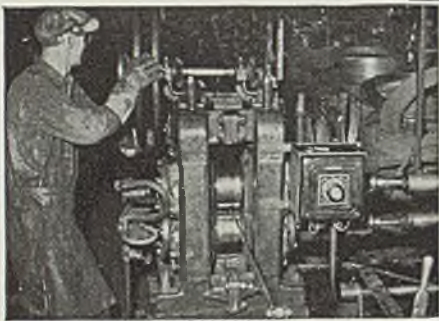
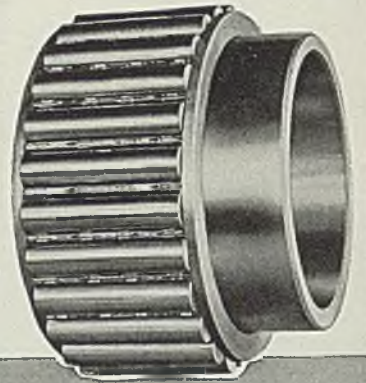


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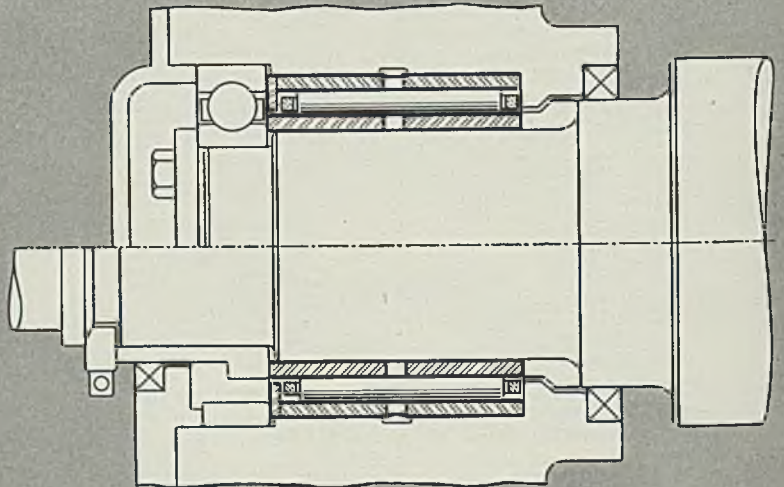
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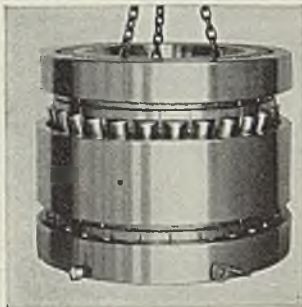
Two-Way ADVANTAGE



The Broden Mill above can handle 100—300 feet per minute in wire up to $\frac{3}{4}$ " in diameter. The Bantam straight radial roller bearing illustrated is designed to carry the high radial loads in the limited space available.



(Left) STRAIGHT ROLLER, TAPERED ROLLER, AND BALL BEARINGS—Bantam makes them all. Many sizes are carried in stock for immediate delivery. Special sizes are supplied up to 72" O.D.



(Right) THIS GIANT BEARING—specially designed and built by Bantam for strip mill service—measures 30" O.D., 18" I.D., 20 $\frac{3}{4}$ " high—a typical instance of Bantam's skill.

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Machine builder and user alike profit from Bantam's engineering skill in the design of special bearings for Broden Construction Company's 8-inch wire flattening mills. Bantam combined ball bearings, to take the thrust, with Bantam straight radial roller bearings to give high radial capacity in a small space. Here is what Broden engineers say:

"From the design standpoint these bearings have a decided advantage in their high capacity for the small space occupied. Bantam's design makes for ease in assembly."

And from the field, where these mills have been seeing TOUGH service, flattening wire up to $\frac{3}{4}$ " in diameter, the operators report equal satisfaction, for the mill rolls run true on Bantam Bearings.

You and your customers can profit also by Bantam's engineering skill. If you have an unusual bearing problem, **TURN TO BANTAM.**

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BANTAM BEARINGS

STRAIGHT ROLLER • TAPERED ROLLER • NEEDLE • BALL

HIGHLIGHTING THIS ISSUE

■ STEEL production last week was at 96½ per cent of ingot capacity (p. 29), unchanged from the previous week. Demand continues heavy so that delivery dates on some products continue to recede a little farther into the future. Heaviest pressure just now is for plates and shapes. Because actual consumption is so great (p. 91), steel inventories at consuming plants are unusually light. Stocks at warehouses are badly depleted in certain items. Users of pig iron and scrap find it necessary to be less particular with respect to analyses. Shortages of raw materials such as coke and pig iron are forcing some steelmakers into barter arrangements to help each other out.

After talking with steelmakers and after studying steelmaking costs, Defense Commissioner Leon Henderson (p. 21) holds that no steel price increase would be justified under present conditions. This also appears to represent the majority view of the industry. Tendency not to spiral prices was reflected (p. 109) in reaffirmation, late last week, of the existing levels on ferromanganese and ferroalloys. . . . Responsible officials in Washington (p. 22) concur in the belief that present steelmaking capacity is sufficient for all expected needs. . . . Heat-treating furnaces should be ordered quickly when the need for them is seen (p. 23), warns the Industrial Furnace Manufacturers association.

Same Prices Called For

An analysis of the 1940 elections (p. 32) indicates that the next congress is unlikely to embark on new experiments but, rather, will endeavor to perfect and revise accepted social reforms. This belief is heightened by the certainty that foreign affairs will demand increasing attention. . . . In the Graham-Paige administration building in Detroit (p. 37) are samples

Fewer Experiments

of airplane parts which the government wants in large quantities. Anybody interested in obtaining some of this business can get information from army air corps experts who are on the ground to answer questions. . . . The government announces a plan (p. 22) to make labor available when and where needed.

With modern armies traveling on wheels, repair plants must be equally mobile. STEEL presents pictorially (p. 46) a machine shop, a welding shop and other maintenance trucks that figure in our armament program. . . . Toughness of 4½ per cent nickel and 1½ per cent chromium white cast irons can be increased (p. 52) by low-temperature annealing. . . . A new series of rust preventives (p. 52) has been developed. . . . Rustless Iron & Steel Corp. (p. 54) has completed a 5-year expansion and improvement program. . . . Development of a series of coated aluminum-bronze welding rods makes it possible to produce bronze welds that have higher strengths than mild steel and hardness up to 387 brinell.

Work Shop On Wheels

Surface conditioning of billets, blooms, slabs and other intermediate shapes through the use of the oxyacetylene flame now is current practice in most steel plants; described (p. 62) is the setup at the Lackawanna plant of Bethlehem Steel Co. . . . R. E. Zimmerman (p. 68) discusses standardization in the products of the steel industry. . . . Fred Merish (p. 71) cites case histories to prove that modern handling facilities increase production as much as 80 per cent. . . . In the rebuilding of gray cast iron parts, soft, machinable welds readily are obtained but careful procedure (p. 76) must be followed. . . . A new machine (p. 78) bands shells by swaging.

Surfacing Billets

We have the STEEL!

Immediate Shipment Assured

The ability to deliver promptly is, of course, of outstanding importance today, but Ryerson offers still more. The buyer who may need angles, sheets, bars, welding rod, and many other items is assured uniform high quality regardless of the size of his order. Under the Ryerson Certified Steel Plan, stocks include only selected products that meet the most demanding specifications. The purchaser can then concentrate orders for practically all his steel requirements, securing uniform high quality and quick service at a saving of time and money.

Ryerson certified alloy steels are an outstanding example of the care used in the selection of our stocks. To assure uniformity, entire heats (100 to 150 tons) of an alloy that meets our narrow range specifications are secured. Bars are analyzed and tested for chemical and physical properties and heat treatment response. Every bar is clearly identified with the heat number. Data sheets and charts showing properties of the steel and results of the tests are prepared and sent with every order, large or small, as a guide to heat treatment. This valuable service is given at no extra cost.

Ten large Ryerson plants carrying more than 10,000 kinds, shapes, and sizes of steel products stand ready to meet both your regular and emergency requirements. If you do not have the current Ryerson Stock List, we shall be glad to send a copy.

Joseph T. Ryerson & Son, Inc. Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.



RYERSON

Government Expects "A Lot of Steel at No Price Advance"

Price Stabilization Group Studies Manufacturing Costs.

Supplies of Pig Iron, Scrap, Coke Believed Adequate.

Efficient Distribution of Labor Supply Planned.

Defense Officials Develop Amortization Procedure.

WASHINGTON
■ CONTINUOUS study of steel-making costs by the price stabilization section of the national defense advisory commission is developing from the commission's survey of pig iron, scrap and coke supplies and prices.

Tentative opinion of commission officials is that no steel price increase is justified under present conditions. Executives of some of the large integrated companies also recently have stated that present prices are adequate on the basis of present costs; they also expressed hopes that costs would not increase to the extent of requiring higher prices. The position of some of the smaller nonintegrated companies, however, is less favorable.

Representatives of steel producing companies last week conferred individually with Leon Henderson and his price stabilization section, and conferences will be continued at least through this week. While all conferences were executive sessions and no statements were issued, it is understood they concerned prices and supplies of raw materials as well as other industry problems. Impressed on the steel producers was the government's expectation for a lot of steel at no price advance.

Conferences with pig iron, scrap and coke producers have convinced commission officials that supplies of these materials are adequate to meet prospective demands of steel-makers.

While temporarily tight situations admittedly exist among several companies which have made large forward commitments, con-

sistent with heavy backlogs, the commission officials believe their surveys show no long-term shortage of steelmaking raw materials unless the armament program is increased considerably.

Mr. Henderson believes adequate



Leon Henderson

supplies of iron, scrap and coke will continue to be available at about the present price level. He said he had been assured by merchant pig iron producers of their ability to supply all foreseeable needs at current prices. He also said he understood one producer which recently advanced pig iron prices \$1.50 was affected by local conditions. This, he explained, was the necessity for shipping coke a considerable distance to one of the company's furnaces.

Mr. Henderson also predicted an adequate supply of coke. Some increase in by-product capacity is being constructed, he explained, and when shortages appear, the old bee-hive ovens are being placed in production.

The price stabilization section also is continuing studies of copper and other nonferrous metals prices. Highlight of recent conferences between Mr. Henderson and copper industry representatives was a declaration by the former that 13-cent copper was too high. He believes, however, that the current copper price is just and reasonable from both an industry and government viewpoint, and that the earnings record of copper companies substantiate this view.

It is understood the administration is reluctant to undertake any price-fixing action so long as the industry continues to co-operate to prevent widespread unreasonable advances. This attitude is applicable to other industries as well as copper, it was said.

If prices rise unreasonably or if a shortage in copper supply devel-

ops, the commission has under consideration two plans to meet the situation. One is a graduated tariff on copper imports. The tariff would go down when domestic prices increase and the tariff would rise when domestic prices fall. It is believed this plan might stabilize prices at a level fair to the industry and to government.

The second plan involves the use of a 1914 law which authorizes the secretary of navy to make emergency purchases of raw materials abroad, which may enter the United States free of duty.

Defense officials generally are loud in their praise of the cooperation of industries in keeping prices in hand, although copper, lead, zinc and a few other prices have been subject to some criticism.

No less emphatic was Mr. Henderson in defending the progress toward armament made by the government. Aroused by criticisms of the slowness in executing the program, the defense commissioner said: "I have studied the experience of other countries in their preparations for rearmament or war. Germany devoted six long years to her rearmament effort. England has been serious since Munich.

"I honestly believe that this country has made more progress in the

last five months in setting up an organization for handling the emergency, and toward rearmament, than any country ever did in the same number of months."

"NO INGOT SHORTAGE," BOARD TELLS PRESIDENT

President Roosevelt last week revealed he had canvassed the steel supply situation with the national defense advisory commission and had been informed there would be no ingot shortage this winter. Some shortage of processing facilities is possible, the President said, although he did not specify what types of facilities were inadequate.

The President discussed the steel situation as one of the problems which will be watched by the new priorities board composed of William S. Knudsen, E. R. Stettinius Jr. and Leon Henderson. The board, he said, would not concern itself so much with the output of finished articles as with specific problems of raw and semifinished material output, labor, and assembly facilities.

Mr. Roosevelt also announced that henceforth this country's output of munitions will be distributed between United States and Great Britain on a 50-50 basis. This means a slightly greater proportion of the total will go to England.

In those instances where the available labor supply appears to be inadequate, its clearance machinery will be put into operation so that local state employment offices will have access to interstate and inter-regional resources in locating needed workers. The information will also be used to prevent unnecessary migration of labor to areas where there already are more workers than can be used, and to avoid the transfer of workers from communities where they are, or shortly will be, needed.

WPA PROJECTS FOR DEFENSE GIVEN BLANKET PRIORITY

An arrangement between the WPA and the war department will give blanket priority to all projects of types designated by the army as important to national defense, Howard O. Hunter, acting commissioner of work projects, announced.

The new system is expected to reduce the time required to begin operating projects providing or improving the country's military facilities.

Since July 1, projects in these categories have been certified individually by the secretary of war. Certification by the secretary of war or navy not only gives priority to a project but also permits relaxation of requirements regarding sponsors' funds, limitation on hours of work and monthly wages and restrictions on the amount of WPA funds which may be spent on individual buildings.

The secretary of war has now given "blanket" certification to all pending and future projects in certain categories, making it no longer necessary for the war department to act on individual applications except in certain instances, Mr. Hunter explained.

The categories of projects covered by the "blanket" certification follow in the order of priority designated by the war department:

1. All projects sponsored by the war department.
2. Airport projects at sites designated by the war department as important for military purposes, except those for construction of hangars and other buildings.
3. Construction or reconstruction of access roads to military posts and concentration areas designated by the war department.
4. National guard facilities, except buildings for which WPA funds would exceed \$100,000.
5. Reserve officers' training corps facilities, except buildings for which WPA funds would exceed \$100,000.
6. Highways on a national strategic network designated by the war department.
7. Health and sanitation projects approved by the U. S. public health service in the vicinity of war department posts and concentration areas, if the surgeon of the appropriate

Employment Services To Aid in Controlling Defense Labor Supply

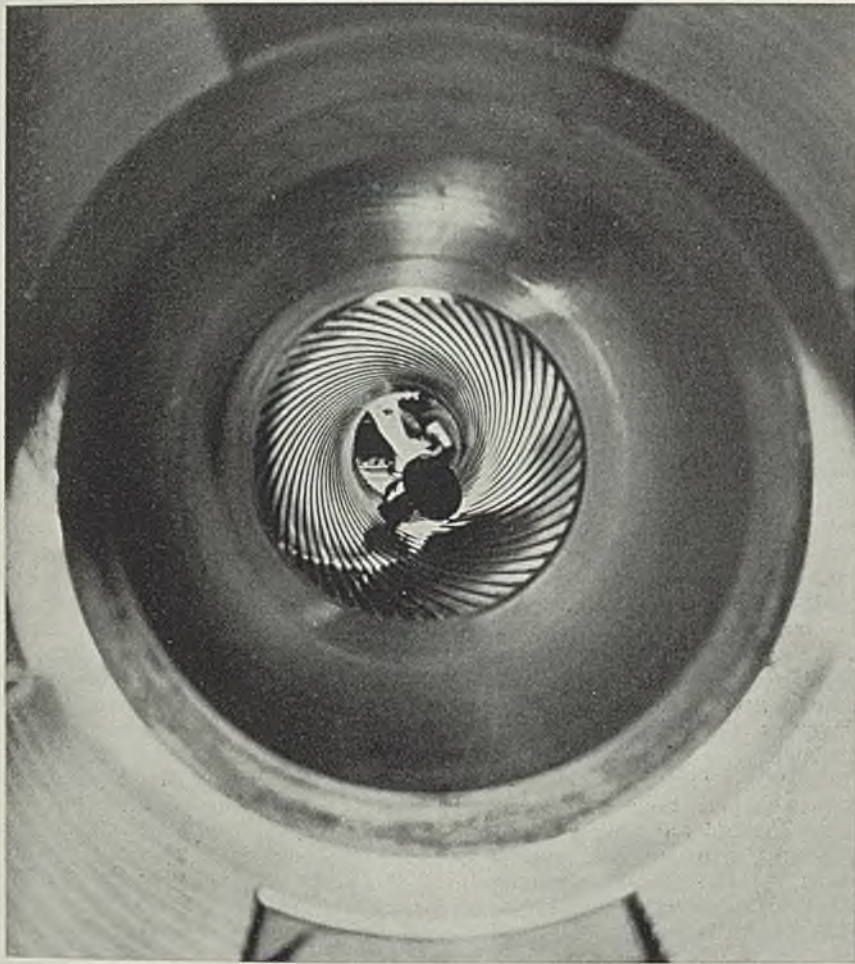
■ A SMOOTHER and more adequate flow of labor from the offices of the United States employment service to defense industries is expected from a plan recently tested for ascertaining employers' estimated labor requirements and the availability of workers. Impressed by the results of the trial, the employment service has announced that it will extend the program to cover about 20,000 employers. These firms, none of which employs fewer than 20 workers, will be interviewed at 30-day intervals by representatives of state employment services.

The selection of employers for interview will not be restricted to those holding defense contracts but will include those producing equipment and materials regarded as essential to the defense program. In addition to aircraft, shipbuilding, ammunition, and machinery and parts industries, firms producing automotive equipment, glass, rubber, petroleum, iron and steel, and other products, will be included. Employers in other industries may

be added as the defense program expands.

The plan provides for obtaining information from employers regarding their prospective labor needs during the 60 days following each monthly interview. Since most firms are geared to an operating schedule of at least this duration, it is expected employers will be able to furnish estimates of the number of workers they expect to hire, with some indication of the occupational skills and other specifications involved. Information also will be sought regarding layoffs. The service has given the assurance that all information obtained from an employer will be regarded as confidential and the identity of any individual firm will not be disclosed.

The results of these surveys, which will be made on a nationwide basis utilizing the personnel of the 1500 state employment offices, will be used to guide the United States employment service in recruiting workers and in avoiding dislocation of labor markets.



■ Inspection: A workman at the Rock Island, Ill., arsenal examines the rifling of a 155-millimeter howitzer barrel. The gun is of the World War period. If the rifling is good, the gun is reconditioned. The arsenal is a hive of activity as work is rushed on new armament and the reconditioning of old. NEA photo

corps area considers the work beneficial.

Certification of individual projects will continue to be required on airport buildings and on national guard and R.O.T.C. buildings on

which WPA funds would exceed \$100,000.

The method of individual certification also continues for projects sponsored by the navy department or in which the navy is interested.

Procedure for Defense Plant Amortization Is Announced

■ PROCEDURE has been worked out jointly by the national defense advisory commission, the war, navy and treasury departments to handle applications from manufacturers for certification required by the amortization section of the new tax law.

This law provides that manufacturers in certain instances may use an accelerated rate of depreciation for income and excess profits tax purposes on plants or equipment certified as necessary in the interest of national defense during the emergency period. Specifically, a

manufacturer who constructed or acquired new facilities after June 10, 1940, may, in determining his taxes, amortize the cost of such facilities over a five-year period instead of the normal period of depreciation of such property if he receives a "Necessity Certificate."

When a manufacturer is being reimbursed by the government for the cost of his new facilities at a rate exceeding normal depreciation either directly or indirectly the manufacturer will be required to obtain a "Certificate of Government Protection," stating that the

contract adequately protects the government on the facilities' future use and disposition.

If the manufacturer is not being thus reimbursed he may obtain a "Certificate of Non-Reimbursement" to that effect which will conclusively establish for the purpose of tax law that a "Certificate of Government Protection" is not required.

All three certificates require the approval of the defense commission and either the secretary of war or secretary of navy. Certification is to be made to the commission of internal revenue. Instructions covering the information required on application for these certificates may be obtained from the office of the assistant secretary of war or the office of the judge advocate general of the navy. Instructions also are being forwarded to war department district procurement officers.

In announcing joint approval of this procedure, Donald M. Nelson, co-ordinator of national defense purchases, said: "Completion of the procedure for obtaining rapid depreciation of facilities constructed to meet the requirements of the defense program should materially benefit and expedite the armament effort."

ASK BUYERS' CO-OPERATION IN ORDERING FURNACES

Heat treating furnaces needed for the manufacture of munitions and other metal products essential to the defense program should be ordered immediately if delivery is to be assured when it actually is required. This is the gist of a survey just completed by the Industrial Furnace Manufacturers association, New York. Survey also disclosed:

Orders for heat treating furnaces are being placed at a rapidly increasing rate.

In the case of large production furnaces built on the user's premises, (a) about half the manufacturers of this equipment cannot maintain present deliveries with any further increase in volume unless there is a greater acceptance of established designs; (b) the balance of the manufacturers can still increase volume by about 25 per cent without extending deliveries, and could do still more if users would not insist on innovations in design; (c) a further increase in production of 25 to 50 per cent could be effected if users would give the furnace manufacturers 60 days' more time.

Practically all manufacturers of small furnaces which are shipped complete from factory could increase present output 10 per cent or more without extending deliveries. They could raise output an additional 25 per cent if users would allow 60 days' more time.

Defense Plant Expansions Tax Structural Fabricating Capacity

NEW YORK

■ EXPANSION of the nation's industrial plants, which will bring structural steel contracts for this year substantially above the 1939 tonnage, is led by the aircraft industry. For additional space for the manufacture of engines and assembly, 106,952 tons of fabricated structural steel had been placed with fabricating shops by Nov. 9 since Jan. 1.

This volume is included in 53 contracts ranging from less than 100 to 10,000 tons and does not take into consideration the tonnages already bought for hangars, air field buildings, extensions by partsmakers and miscellaneous facilities which naturally follow such expansion.

Structural contracts covering the latter groups are estimated at 125,945 tons and will continue heavy during the remainder of the year. For the present, bulk of structural contracts covering actual engine and assembly plant construction are placed, although additional extension plans are in the blueprint stage, and, should the British sponsor further aircraft plant construction here, as now contemplated, an additional upturn may be expected.

Steel contracts involving new air-

craft plants are at the top of the list in production and delivery schedules, for until these shops are completed and tooled, the nation's gigantic air fleet continues largely on order. As much of this tonnage is concentrated, having been placed with structural shops in recent weeks, the strain on structural mills and fabricators is severe, although the volume is being rather widely distributed based on ability of individual shops to expedite deliveries and steel erection.

Great as is present demand on mills and fabricating shops, congestion is even more evident in the preparation of plans, design and engineering details. Until these are complete, fabricating shops, and to some degree structural mills, are geared to the availability of blueprints.

Had this work been spread over normal periods, both mills and fabricators would have experienced no difficulty. Structural mill rolling capacity now is 5,205,300 tons annually. The fabricating industry in recent years has operated not much above 50 per cent of capacity. Distribution of structural shapes, over 3-inch, last year through all channels totaled 2,583,101 tons and struc-

tural fabricating shop bookings, 1,305,049 tons.

Plans call for most of these new aircraft plants to be in production by May which means speed records in production, preparation of material and construction work. There is ample evidence such records will be attained. An example is a large foundry building for the Bullard Machine Co., Bridgeport, Conn., completed in 70 days by the Turner Construction Co., part of the structure being erected over a 70-foot creek.

Where possible, plans for new plant expansion are being standardized to speed up fabrication.

\$4,294,798 EXPANSION FOR VULTEE AIRCRAFT

War department has awarded a contract to Vultee Aircraft Inc., Downey, Calif., calling for plant expansion totaling \$4,294,798.11.

New facilities will be constructed under terms of the emergency plant facility contract developed jointly by the national defense advisory commission, the war, navy, treasury departments. The company in each case will furnish funds for construction. Under the contract, the government will repay the cost of the plant expansion over a period of five years.

At the end of five years the contractor will have the option to purchase the property at cost less a pre-arranged rate of depreciation or, alternatively, at a negotiated sum. In the event the contractor does not choose to retain the property, title will be transferred to the government.

An American General and Aircraft Builders



■ Lieut. Gen. H. H. Arnold, former chief of the air corps and now deputy chief of staff, confers with officers of the Glenn L. Martin Co., Baltimore, on the progress in army aircraft production. Martin company is building what is expected to be the world's fastest medium bomber, the B-26. From left to right: Joseph T. Hartson, executive vice president; General Arnold; Glenn L. Martin, president; and Harry F. Vollmer, vice president in charge of manufacturing. Martin last week was awarded the Daniel Guggenheim medal for 1940 for outstanding contributions to aeronautical development

BRITAIN TO BE PERMITTED TO BUY 12,000 MORE PLANES

The priorities board last week announced the British purchasing commission will be permitted to negotiate orders for 12,000 additional airplanes with American aircraft companies. The planes will be built in existing plants and in facilities now under construction.

Under plans being made by the priorities board it is intended to gear construction of British planes to American production in such a way as to prevent interference with United States requirements. Delivery priorities are being studied.

MESTA MACHINE CO. WILL EQUIP GUN TUBE FACTORY

Contract on a fixed-fee basis has been awarded by the war department to the Mesta Machine Co., Pittsburgh, for equipping a gun tube factory at West Homestead, Pa.

Mesta will construct and own the building. Equipment will be installed at a cost of approximately \$1,680,000. The title to this equipment will remain with the government.

STEEL



■ Typical of the automotive industry's booming activity is this night scene, snapped at the Chevrolet plant in Flint, Mich. Weekly automobile production now is in excess of 120,000 units and the industry is preparing to take a more active part in the production of aircraft and other defense materials

\$358,323,114 Aircraft Engine

Awards Lead Defense Purchases

■ GOVERNMENT defense awards totaling \$471,536,030.87 were reported last week by the war and navy departments. Aggregate of war department contracts again exceeded the navy's total.

Largest awards reported by the war department in the week included contracts totaling \$131,306,962.27 to Wright Aeronautical Corp., Paterson, N. J., for airplane engines. Part of the orders to Wright is allocated to the navy, under the new policy whereby the army deals exclusively with Wright Aeronautical Corp. for Wright engines to fill combined army and navy requirements. Such engines as will go to the navy will be paid for by transfer of navy funds to the army.

Ford Motor Co., Dearborn, Mich., received an award for aircraft engines totaling \$122,323,020, and United Aircraft Corp.'s Pratt & Whitney Aircraft division, East Hartford, Conn., was given contracts for aircraft engines aggregating \$104,693,132.34.

Contracts totaling \$8,074,406.25 were awarded by the war department to Colt Patent Fire Arms Mfg. Co., Hartford, Conn., for installation of equipment for manufacture of infantry weapons. Government will retain title to the equipment which will be installed in Colt's buildings. War department announced the following:

Quartermaster Corps Awards

Autocar Sales & Service, Ardmore, Pa., tractor trucks, \$1,653,131.
 Bailey, J. W., Construction Co., Seattle, temporary barracks, Ft. Lewis, Washington, \$83,440.

Blaw-Knox Co., Pittsburgh, class room, Ft. Monroe, Virginia, \$15,766.
 Brown & Hamps, Syracuse, N. Y., temporary housing, Madison barracks, New York, \$199,600.
 Buglecraft Inc., Long Island City, N. Y., 750 trumpets, \$2043.30.
 Dillard, William B., Macon, Ga., radio beacon range building, Lawson field, Georgia, \$4190.
 Dalton, E. L., Dallas, Tex., gas distribution system, San Angelo, Tex., \$10,950.
 Diamond, Arnold M., Brooklyn, N. Y., steam distribution system, Westover field, Massachusetts, \$77,478.
 Eby, Martin K., Construction Co., Wichita, Kans., ordnance magazine, Marshall field, Kansas, \$1790.
 Messer, Frank, & Sons Inc., Cincinnati, temporary addition to administration building, Wright field, Ohio, \$224,700.
 General Motors Corp., Chevrolet division, Detroit, trucks, \$36,716.80.
 Kalamazoo Stove & Furnace Co., Kalamazoo, Mich., 3400 coal-burning heating stoves, \$62,390.
 MacDonald & Kahn Inc., San Francisco, water, sewer, electric distribution systems and buildings, Ft. Lewis, Washington, \$66,955.
 Marshall Stove Co., Lewisburg, Tenn., 3100 coal-burning heating stoves, \$60,760.
 Mullins & Wheeler, Salt Lake City, Utah, gas distribution system, Salt Lake City municipal airport, Utah, \$5165.
 Myer Construction Co., San Francisco, temporary housing, utilities at Presidio, San Francisco, \$284,639.
 O'Driscoll & Grover Inc., New York, temporary housing, Ft. Ethan Allen, Vermont, \$837,737.
 Packard Motor Car Co., Detroit, 5-passenger sedan automobiles, \$35,999.75.
 Pfozter, E. E. J., Pensacola, Fla., engine test building at Southeast Air depot, Mobile, Ala., \$268,780.
 Philadelphia Depot Factory, Philadelphia, flying cadets' insignia, \$562.82.
 Shwayder Bros. Inc., Denver, 59,000 trunk lockers, \$165,200.
 Soling Heating & Cooling Co. Inc., New York, central heating plant, Mitchell field, Hempstead, L. I., \$8350.

Slaymaker Lock Co., Lancaster, Pa., 62,000 padlocks, \$9920.
 Superior Trailer Mfg. Co., Los Angeles, trailers, \$149,059.96.
 Texas Trunk Co., San Antonio, Tex., 3000 trunk lockers, \$9750.
 Trallico Mfg. & Sales Co., Hummels Wharf, Pa., trailers, \$4057.20.
 Walter Motor Truck Co., Ridgewood, L. I., tractor trucks, \$15,000.
 Yellow Truck & Coach Mfg. Co., Pontiac, Mich., trucks, \$133,674.60.
 York Band Instrument Co., Grand Rapids, Mich., 3250 trumpets, \$7979.40.

Ordnance Department Awards

Alco Fabricating Corp., Pawtucket, R. I., artillery ammunition, \$2081.25.
 Allegheny Ludlum Steel Corp., Brackensrdge, Pa., gages, \$3342.
 Aluminum Co. of America, Pittsburgh, ammunition components, \$2156.50.
 American Brass Co., Waterbury, Conn., artillery ammunition, brass strips, \$131,009.75.
 American Car & Foundry Co., Berwick, Pa., engine supports, \$8750.
 American Locomotive Co., Railway Steel Spring division, Latrobe, Pa., automotive equipment, \$1386.50.
 American Machine & Metals Inc., East Moline, Ill., machinery, \$2295.
 Apex Tool & Cutter Co. Inc., Shelton, Conn., machinery, \$1345.52.
 Athey Truss Wheel Co., Chicago, trailers, \$6040.
 Associated Spring Corp., Bristol, Conn., small arms materiel, \$2755.50.
 Autocar Co., Ardmore, Pa., machinery, \$4500.
 Barber-Colman Co., Machine & Small Tool division, Rockford, Ill., machinery, \$3720.
 Barrett, Leon J., Co., Worcester, Mass., oil extractors, \$1307.50.
 Barwood & Co., Philadelphia, gages, \$4669.13.
 Bausch & Lomb Optical Co., Rochester, N. Y., microscopes, \$3199.25.
 Bendix Aviation Corp., Eclipse Aviation division, Bendix, N. J., fire control equipment, artillery materiel, miscellaneous parts, \$1,983,936.43.
 BG Corp., New York, automotive equipment, \$8050.
 Brill, J. G., Co., Philadelphia, artillery materiel, \$80,973.55.
 Borg Warner Corp., Rockford Drilling Machine division, Rockford, Ill., miscellaneous parts for engines, \$19,711.75.
 Bridgeport Brass Co., Bridgeport, Conn., artillery ammunition components, \$135,000.
 Brown & Sharpe Mfg. Co., Providence, R. I., machinery \$120,797.96.

Buffalo Bolt Co., North Tonawanda, N. Y., ammunition components, \$18,485.10.

Carboloy Co. Inc., Detroit, tools, \$1390.

Chicago Tramrail Co., Chicago, machinery, \$7793.

Christiansen, Christian B., Newark, N. J., machinery, \$3100.

Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, machinery, \$8279.

Coll's Patent Fire Arms Mfg. Co., Hartford, Conn., small arms materiel, \$1,173,722.16.

Continental Can Co. Inc., Baltimore, artillery ammunition components, \$2340.

Continental Machines Inc., Minneapolis, machinery, \$1900.

Cook & Chick Co., Chicago, machinery, \$1158.

Crown Cork & Seal Co., Baltimore, small arms materiel, \$1,147,030.

Cunningham, J., Sons & Co., Rochester, N. Y., small arms materiel, \$294,600.

Diebold Safe & Lock Co., Canton, O., automotive equipment, \$5868.75.

Eastman Kodak Co., Rochester, N. Y., fire control equipment, \$227,267.

Eclipse Air Brush Co. Inc., Newark, N. J., machinery, \$4548.

Ever-Tite Mfg. Co., Davenport, Iowa, automotive equipment, \$6804.

Ferracute Machine Co., Bridgeton, N. J., machinery \$6015.

Fischer, Charles, Spring Co., Brooklyn, N. Y., small arms materiel, \$11,141.

Ford Motor Co., Alexandria, Va., trucks, \$171,430.01.

Fox Munitions Corp., Philadelphia, gages, \$1682.

Garman Tool & Die Co., Detroit, gages, \$1040.

General Time Instruments Corp., Westclox division, LaSalle, Ill., artillery ammunition components, \$14,584.

Gibbs, Thos. B., & Co., Delavan, Wis., for Brust Tool Co., Chicago, machines, \$300,000.

Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$11,086.82.

Hanson & Co. Inc., Detroit, gages, \$1772.85.

Hanson-Whitney Machine Co., Philadelphia, gages, \$4566.84.

Ingersoll-Rand Co., Phillipsburg, N. J., machinery, \$449,434.

International Harvester Co., Chicago, tractors, \$631,172.20.

Johnson Tool & Engineering Co. Inc., Dayton, O., gages, \$1825.50.

Kelly, John P., Philadelphia, artillery ammunition, \$2047.50.

Kent-Owens Machine Co., Toledo, O., machinery, \$2464.

Lansdowne Steel & Iron Co., Morton, Pa., ammunition components, \$17,283,750.

LaSalle Steel Co., Chicago, cold-drawn steel, \$189,750.

Lincoln Park Tool & Gage Co., Lincoln Park, Mich., gages, \$17,318.82.

Lloyd & Arms Inc., Philadelphia, machinery, \$16,410.

Lyman Gun Sight Corp., Middlefield, Conn., small arms materiel, \$18,096.

Messinger Bearings Inc., Philadelphia, machinery, \$3965.

Moore, J. W., Machine Co., Everett, Mass., gages, \$4472.

Morrison Machine Co., Paterson, N. J., machinery, \$1214.25.

Morse Twist Drill & Machine Co., New Bedford, Mass., tools, \$1220.74.

National Cash Register Co., Dayton, O., artillery ammunition components, \$1414.08.

New York Thread Grinding Corp., New York, gages, \$1263.65.

Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., drill assemblies, gages, \$26,977.82.

Norton Co., Worcester, Mass., grinding machines, \$56,345.16.

Oliver Iron and Steel Corp., Pittsburgh, ammunition components, \$48,207.02.

Ohio Tool Co., Cleveland, gages, \$1828.

Onsrud Machine Works Inc., Chicago, lot routers, \$7021.

Peerless Paper Corp., Albany, N. Y., tools, \$2155.58.

Pfaudler Co., Rochester, N. Y., machinery, \$1022.

Philadelphia Hardware & Malleable Iron Works Inc., Philadelphia, artillery ammunition components, \$10,462.29.

Precise Tool Mfg. Co., Farmington, Mich., gages, \$11,680.

Prentiss, Henry, & Co. Inc., New York, machinery, \$10,115.

Putman Tool Co., Detroit, tools, \$1520.

Remington Arms Co. Inc., Bridgeport, Conn., small arms materiel, \$48,000.

Revere Copper & Brass Inc., Baltimore, small arms ammunition, \$109,146.86.

Safety Car Heating & Lighting Co. Inc., New York, fire control equipment, \$280,068.

Saginaw Stamping & Tool Co., Saginaw, Mich., trailers, accessories, \$289,599.80.

Silent Hoist Winch & Crane Co., Brooklyn, N. Y., crane cars, \$8140.

Smith & Wesson Inc., Springfield, Mass., small arms materiel, \$23,850.

Sperry Gyroscope Co., Brooklyn, N. Y., fire control equipment, \$138,710.

Spicer Mfg. Co., Toledo, O., automotive equipment, \$35,000.

Standard Gage Co. Inc., Poughkeepsie, N. Y., gages, \$1230.

Standard Machinery Co., Providence, R. I., machinery, \$1024.

Standard Products Co., Detroit, small arms materiel, \$3000.

Superior Die Casting Co., Cleveland, ammunition components, \$2346.

Taylor-Wharton Iron & Steel Co., Easton, Pa., machinery, \$3840.

Templeton, Kenly & Co., Chicago, ratchet jacks, \$20,930.

Timken-Detroit Axle Co., Wisconsin Axle division, Oshkosh, Wis., drive assemblies, \$5424.42.

Tools & Gages Inc., Cleveland, gages, \$31,345.

Tri-Metal Products Corp., Conshohocken, Pa., artillery ammunition, \$1801.80.

Purchases Under Walsh-Healey Act

Purchases Under Walsh-Healey Act

(In Week Ended Oct. 26)

Iron and Steel Products	Commodity	Amount
Aerial Machine & Tool Corp., New York	Forgings and castings	\$62,200.90
	Steel	34,494.30
Allegheny Ludlum Steel Corp., Brackenridge, Pa.	Gas ranges	95,654.25
American Stove Co., Cleveland	Dummy projectiles	33,504.00
Atlantic Mfg. Co., Philadelphia	Anchor chains	53,877.00
Baldt Anchor Chain & Forge Corp., Chester, Pa.	Superstructures, tees	97,257.90
Bethlehem Steel Co., Bethlehem, Pa.	Forgings	116,893.40
Camden Forge Co., Camden, N. J.	Sheet piling, steel sheets, I-beams	479,295.54
Carnegie-Illinois Steel Corp., Pittsburgh	Forceps and holders	19,462.00
Cleveland Pneumatic Tool Co., Cleveland	Bends, fittings	10,668.19
Crane Co., Chicago	Forgings	2,332,343.02
Crucible Steel Co. of America, New York	Booster cups	70,428.00
Doehler Die Casting Co., Pottstown, Pa.	Floor gratings	11,742.72
Dravo Corp., Pittsburgh	Forgings	1,162,366.40
Erle Forge Co., Erie, Pa.	Booster parts	560,774.00
Federal Screw Works, Detroit	Forgings	94,250.00
Finkl, A., & Sons Co., Chicago	Yokes	81,865.20
Goodman Mfg. Co., Chicago	Demolition bombs	265,000.00
Harrisburg Steel Corp., Harrisburg, Pa.	Tubes	23,610.32
Hunt, J. R., & Co., Baltimore	Sheet piling	*30,528.00
Inland Steel Co., Chicago	Pipe fittings	17,656.85
Kennedy Valve Mfg. Co., Elmira, N. Y.	Body forgings	176,640.00
Lansdowne Steel & Iron Co., Morton, Pa.	Telescope mounts	28,798.00
Lundquist Tool & Mfg. Co., Worcester, Mass.	Water pipe	13,010.00
Lynchburg Foundry Co., Lynchburg, Va.	Furnaces	26,233.60
Mahr Mfg. Co., Minneapolis	Gas ranges	310,971.00
Majestic Mfg. Co., St. Louis	Valves	*14,784.55
Manning, Maxwell & Moore Inc., Bridgeport, Conn.	Fabricated steel	49,601.50
Midland Structural Steel Co., Cicero, Ill.	Forgings	616,153.00
Midvale Co., Philadelphia	Metal crates	45,400.00
Mitchell Metal Products Inc., Cleveland	Forgings	1,006,003.80
National Forge & Ordnance Co., Irvine, Pa.	Steel chains	26,880.00
National Malleable & Steel Casting Co., Cleveland	Body forgings	264,147.50
National Tube Co., Pittsburgh	Nose plugs	58,991.63
Oliver Iron & Steel Corp., Pittsburgh	Machining forgings	40,000.00
Peco Mfg. Corp., Philadelphia	Forgings	267,641.74
Pennsylvania Forge Corp., Philadelphia	Anchors	11,210.00
Portland Co., Portland, Me.	Steel, bolts and nuts	91,413.33
Republic Steel Corp., Cleveland	Wire cloth, wire	41,513.58
Roebling's, John A., Sons Co., Trenton, N. J.	Nuts	19,813.93
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.	Iron unions	15,698.19
Samuel Levine, New York	Steel pipe	35,889.21
Southern Pipe & Casing Co., Azusa, Calif.	Gas ranges	102,550.63
Standard Gas Equipment Corp., Baltimore	Forgings	184,295.00
Struthers Wells-Titusville Corp., Titusville Forge division, Titusville, Pa.	Steel	11,269.30
Timken Roller Bearing Co., Steel & Tube division, Canton, O.	Ignition harness	41,250.00
Titeflex Metal Hose Co., Newark, N. J.	Water pipe	16,000.00
U. S. Pipe & Foundry Co., Philadelphia	Adapters	21,228.00
Ulmer, A. J., New York	Steel drums	53,783.92
Wackman Welded Ware Co., St. Louis	Pipe fittings	37,600.50
Walworth Co., New York	Steel	21,766.76
Washburn Wire Co., New York	Tools	10,989.36
Wright Aeronautical Corp., Paterson, N. J.		

*Estimated.

Union Parts Mfg. Co. Inc., Brooklyn, N. Y., artillery ammunition components, \$31,700.65.
 Universal Crusher Co., Cedar Rapids, Iowa, small arms materiel, \$244,125.
 U. S. Steel Export Co., New York, ammunition components, \$150,832.
 U. S. Tool Co. Inc., Ampere, (East Orange), N. J., machinery, \$9800.
 Vinco Corp., Detroit, gages, \$12,246.60.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., machinery, \$30,000.
 Waterhouse Co., Webster, Mass., artillery materiel, \$15,702.65.
 West & Dodge Thread Gauge Co. Inc., Boston, gages, \$42,765.35.
 Western Cartridge Co., Winchester Repeating Arms Co. division, New Haven, Conn., small arms materiel, \$4465.
 Whistler, S. B., & Sons Inc., Buffalo, gages, \$4253.
 Zeiss, Carl, Inc., New York, microscopes, \$3543.

Air Corps Awards

Allen, H. F. Co. Inc., New York, drill presses, \$17,440.
 Allith-Prouty Inc., Danville, Ill., washers, spacers, supports, \$5191.66.
 Banner Die Tool & Stamping Co., Columbus, O., shackle assemblies, \$141,750.
 Barnard Aviation Equipment Co. Inc., Ashley, Pa., generators, \$30,700.
 Bendix Aviation Corp., Pioneer Instrument division, Bendix, N. J., indicator, compass and tube assemblies, brake assemblies and inverters, \$4,652,341.
 Cleveland Automatic Machine Co., Cleveland, machines, \$19,016.40.
 Colson Corp., Elyria, O., stand assemblies, \$36,270.
 Firestone Tire & Rubber Co., Akron, O., wheel assemblies, \$34,731.10.
 Goodyear Tire & Rubber Co., Akron, O., wheel and brake assemblies, \$1,531,331.10.
 Gosiger, C. M., Machinery Co., Dayton, O., drill presses, \$141,500.

Hayes Industries Inc., Jackson, Mich., wheel and brake assemblies, \$803,720.
 International Engineering Inc., Dayton, O., stand assemblies, \$24,744.91.
 Kinsey, E. A. Co., Cincinnati, drill presses, \$88,369.
 Larkin, M. D. Co., Dayton, O., drill presses, \$4895.
 Moore Eastwood & Co., Dayton, O., generators, \$94,341.
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., drill presses, \$120,255.
 Sperry Gyroscope Co., Brooklyn, N. Y., indicator, controller assemblies, \$9,961,240.
 Spriess Tool & Mfg. Co. Inc., Buffalo, shackle assemblies, \$335,920.
 Square D Co., Kollsman Instrument division, Elmhurst, N. Y., altimeter assemblies, indicator assemblies, \$2,967,985.
 Warner & Swasey Co., Cleveland, lathes, \$147,623.50.
 Weston Electrical Instrument Corp., Newark, N. J., indicator assemblies, \$1,509,420.
 Wright Aeronautical Corp., Paterson, N. J., maintenance parts for Wright engines, \$218,851.89.

Purchases Under Walsh-Healey Act (Cont.)

Machinery and Other Equipment	Commodity	Amount
American Engineering Co., Philadelphia	Windlasses	\$517,200.00
Barber-Greene Co., Aurora, Ill.	Conveyor machinery	17,880.00
Berna, Tell, Cleveland	Machine tools	15,000.00
Bliss, E. W. Co., Toledo Machine & Tool division, Toledo, O.	Trimming presses	11,337.20
Borg-Warner Corp., Rockford Drilling Machine division, Rockford, Ill.	Flywheels	25,151.28
Bullard Co., Bridgeport, Conn.	Boring mills	299,815.70
Chicago Pneumatic Tool Co., Philadelphia	Pneumatic drills	10,143.60
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati	Milling machines	77,447.00
Cleveland Tractor Co., Cleveland	Tractors	86,560.00
Dana Tool-D. Nast Machinery Co., Philadelphia	Twist drills	12,923.63
Dayton-Dowd Co., Quincy, Ill.	Pumping units	16,028.00
Forsythe Equipment Co. Inc., Long Island City, N. Y.	Crane	10,860.00
Gardner-Denver Co., Quincy, Ill.	Compressor plant	14,843.00
Heald Machine Co., Worcester, Mass.	Grinders	10,779.00
Ice Cooling Appliance Corp., Chicago	Refrigerators	233,800.00
Ingersoll-Rand Co., New York	Air compressor	11,800.00
Jones & Lamson Machine Co., Springfield, Vt.	Thread grinders	28,835.80
Kingsbury Machine Tool Corp., Keene, N. H.	Drilling machines	105,734.00
Landis Tool Co., Waynesboro, Pa.	Grinding machines	35,035.00
McGill Mfg. Co., Valparaiso, Ind.	Bearings	16,648.30
Monarch Machine Tool Co., Sidney, O.	Lathes	80,784.00
National Brouch & Machine Co., Detroit	Milling machines	26,316.00
New Britain Machine Co., New Britain-Gridley Machine division, New Britain, Conn.	Screw machine	20,882.00
Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn.	Automatic machine, lathes	32,178.00
Norton Co., Worcester, Mass.	Grinders	17,333.52
Portland Machinery Co., Portland, Ore.	Engine lathe	12,553.00
Prentiss, Henry, & Co. Inc., New York	Turret lathes	26,841.00
Reed-Prentice Corp., Worcester, Mass.	Die casting machines	10,960.00
Rotary Lift Co., Memphis, Tenn.	Lift assembly	10,880.00
Sellers, William, & Co. Inc., Philadelphia	Planers	36,675.00
Shibley, W. E., Machinery Co., Philadelphia	Boring machines	53,565.00
Swind Machinery Co., Philadelphia	Boring machines	29,891.00
Van Norman Machine Tool Co., Springfield, Mass.	Milling machines	10,327.00
Vandyek Churchhill Co., Philadelphia	Boring mill, milling machines	91,080.00
Vulcan Copper & Supply Co., Cincinnati	Distillation equipment	26,200.00
Warner & Swasey Co., Cleveland	Turret lathes	15,892.00
Western Laundry Machinery Co., North Kansas City, Mo.	Laundry equipment	12,003.00
Wilson-Brown Inc., New York	Turret lathes	10,137.00
Nonferrous Metals and Alloys		
Aluminum Co. of America, Pittsburgh	Conductor, powdered magnesium	\$86,116.00
American Brass Co., Waterbury, Conn.	Cartridge cups, jacket cups, rotating bands	223,623.00
American Metal Crafts Co., Attleboro, Mass.	Collar insignia	85,575.81
Bridgeport Brass Co., Bridgeport, Conn.	Cartridge cases	364,965.00
Elite Specialty Metal Co. Inc., New York	Collar insignia	10,175.00
Metal Reduction Corp. of N. J., North Bergen, N. J.	Bronze ingots	29,670.00
Onelda Ltd., Onelda, N. Y.	Tableware	23,712.50
Scovill Mfg. Co., Waterbury, Conn.	Booster parts, fuse parts, cartridge cases and cups	728,360.00
Stewart-Warner Corp., Chicago	Fuse parts, fuses	1,371,361.04

Chemical Warfare Service Awards

Ams, Max, Machine Co., Bridgeport, Conn., machinery, \$7890.
 Bliss, E. W. Co., Brooklyn, N. Y., machinery, \$30,605.
 Brown & Sharpe Mfg. Co., Providence, R. I., screw machines, \$8341.50.
 Continental Can Co. Inc., New York, manufacturing aids, \$2960.
 Doehler Die Casting Co., New York, manufacturing aids, \$1728.
 Exact Weight Scale Co., Columbus, O., scales, \$1155.
 Federal Electric Co. Inc., Chicago, siren type alarms, \$78,159.38.
 Frederick Iron & Steel Co., Frederick, Md., pumps, \$2096.
 Gallon Iron Works & Mfg. Co., Gallon, O., road roller, \$3774.
 Hardinge Bros. Inc., Elmira, N. Y., lathes, \$2943.60.
 Hayes, C. I., Inc., Providence, R. I., furnaces, \$2256.80.
 International Engineering Inc., Dayton, O., portable mixers, \$1830.
 Leeds & Northrup Co., Philadelphia, furnaces, \$7665.78.
 Leiman Bros. Inc., Newark, N. J., pumps, \$10,608.
 Manhattan Perforated Metal Co. Inc., Long Island City, N. Y., perforated brass, \$3182.
 Nash Engineering Co., South Norwalk, Conn., pumps, \$5059.20.
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., vertical shaper, \$6468.35.
 Prentice, G. E., Mfg. Co., New Britain, Conn., hook and eye clasps, \$28,050.40.
 Swind Machinery Co., Philadelphia, drill press, \$2909.
 Wiedmann Machine Co., Philadelphia, rotary punch, \$1432.

Corps of Engineers Awards

American Car & Foundry Co., Milton, Pa., tank cars, \$679,640.
 Cincinnati Tool Co., Norwood, O., ponton bridge equipment, \$77,865.33.
 Evinrude Motors, Milwaukee, motors and spare parts, \$75,233.16.
 General American Transportation Corp., East Chicago, Ind., box cars, \$54,900.
 Harris-Seybold-Potter Co., Cleveland, lithographic press, \$20,150.
 Ingersoll-Rand, Painted Post, N. Y., pneumatic saws, \$94,027.50.
 MacLane Hardware Co., New York, saws, picks, \$26,146.38.
 Q-O-S Corp., New York, stereoscopes, \$113,316.
 Rogers Bros. Corp., Albion, Pa., trailers, \$118,426.
 Wallace & Tiernan Co., Belleville, N. J., portable water purification units, \$120,835.

(Please turn to Page 110)

FINANCIAL

INDUSTRY'S THIRD QUARTER NET TOTALED \$83,302,370

■ TWENTY-ONE leading steel producers, representing 89.5 per cent of the industry's ingot capacity, earned an aggregate net income of \$73,660,623 in the quarter ended Sept. 30. This was 149 per cent greater than \$29,583,651 net profit earned by the same companies in third quarter, 1939. Aggregate net income earned by the 21 producers in the June, 1940, quarter was \$46,558,618, and was exceeded in the third quarter by 58 per cent.

Total net earnings reported by the same companies in first nine months this year was \$164,635,344, greater by 215 per cent than \$52,158,222 net income earned in the corresponding period of 1939.

Assuming these producers' net profit to be representative, total net income for the industry in third quarter would be about \$82,302,370. In first three quarters of 1940, the industry's total net, based similarly, would be \$183,950,100. Computations for the period last year indicated net income in first nine months of 1939 was approximately \$58,277,340.

Operating rate in third quarter

was 87.93 per cent, against 62.63 per cent in the quarter last year and 72.66 per cent in the June, 1940, period. For the nine months it averaged 77.77 per cent, against 56.23 per cent in first three quarters of 1939.

Average net income per ton of ingots produced in first three quarters this year was about \$3.93, compared with \$1.74 per ton in the period in 1939. Third quarter, 1940, net income per ton of ingots produced averaged about \$4.62, against \$2.60 per ton in third quarter last year and \$3.71 per ton in June, 1940, quarter.

Several producers reported their third quarter net was substantially decreased because of provisions from that period's earnings for retroactive increases in federal taxes.

No. 1 Aliquippa Stack To Be Air Conditioned

■ Contracts for air conditioning No. 1 stack of Jones & Laughlin Steel Corp.'s Aliquippa, Pa. group of blast furnaces have been let to Carrier Corp., Syracuse, N. Y. This will be the first northern blast furnace to be so equipped.

Last year two stacks of the Wood-

ward Iron Co., Woodward, Ala., were provided with this type of equipment and their operation shows that with lower moisture content there is a reduction in the amount of coke required per ton of iron as well as an increase in the output. For a description of the Woodward installation see STEEL, Nov. 20 and 27, 1939.

41 Coke Ovens Ordered For Indianapolis District

■ Citizens Gas & Coke Utility Co., Indianapolis, has awarded Koppers Co., Pittsburgh, a contract for 41 coke ovens at a cost of \$1,100,000. It is believed the ovens will add a third to the capacity of the present 120 ovens, having a daily average of 12,000,000 cubic feet of gas and a monthly average of about 29,400 tons of coke.

Increased industrial activity, largely incident to the national defense program, in the Indianapolis area has been reflected in growing sales of gas and coke. A shortage of foundry or metallurgical coke is developing.

Granite City Steel To Install Hot Strip Mill

■ Granite City Steel Co., Granite City, Ill., will install a fifth 90-inch hot strip mill. The mill, which will be completed by late January, will bridge the gap between the company's production of heavy and light steels and also will permit increased capacity for cold-rolled strip.

Steel Corp. Shipments Near Alltime High

■ Finished steel shipments by the United States Steel Corp. in October totaled 1,572,408 net tons, highest since the record 1,701,874 tons in May, 1929. This is an increase of 179,570 tons over September shipments of 1,392,838 tons and of 226,553 tons over 1,345,855 tons in October, 1939. For ten months aggregate shipments were 12,006,135 tons, compared with 8,901,942 tons in corresponding 1939 period.

(Inter-company shipments not included)

	Net Tons			
	1940	1939	1938	1937
Jan.	1,145,592	870,866	570,264	1,268,403
Feb.	1,009,256	747,427	522,395	1,252,845
March	931,905	845,108	627,047	1,563,113
April	907,904	771,752	550,551	1,485,231
May	1,084,057	795,689	509,811	1,443,477
June	1,209,684	807,562	524,994	1,405,078
July	1,296,887	745,364	484,611	1,315,353
Aug.	1,455,604	885,636	615,521	1,225,967
Sept.	1,392,838	1,086,683	635,645	1,161,113
Oct.	1,572,408	1,345,855	730,312	875,972
Nov.	1,406,205	749,328	648,722	539,368
Dec.	1,443,969	765,868		
Total by Months	11,752,116	7,286,347	14,184,772	
Adjustment	*44,865	†29,139	*87,106	
Total	11,707,251	7,315,506	14,097,666	

†Increase. *Decrease.

124 Consumers' 9 Months' Earnings Up 47.8 Per Cent

■ AGGREGATE net income earned in the third quarter by 124 iron and steel consumers was \$56,105,105. This was an increase of 47.8 per cent over \$37,952,209 earned by the same companies in the corresponding period in 1939. Eight companies reported net loss for the quarter, against 21 last year. The same companies' aggregate net earnings in the first nine months this year totaled \$178,591,191, or 73.4 per cent more than \$102,934,651 in the three quarters last year. Seven reported a loss for the nine months, against 19 in the period in 1939. Prior tabulations in STEEL (Oct. 28, p. 28 and Nov. 4, p. 23) listed 93 companies; the following includes 31. All figures are net earnings, except where asterisk denotes loss:

	Third Quarter		— Nine Months —	
	1940	1939	1940	1939
Aetna Ball Bearing Mfg. Co., Chicago	\$ 67,469	\$ 50,031	\$191,863	\$163,214
Air-Way Electric Appliance Corp., Toledo, O.	4,182	1,320*	42,343	6,440
Allied Products Corp., Detroit	126,024†	128,079†	344,772	176,049
American Bosch Corp., Springfield, Mass.	173,049	34,287*	556,700	14,771
Birtman Electric Co., Chicago	108,088	99,759	297,951	257,503
Borg-Warner Corp., Chicago	1,294,248	1,066,986	4,125,231	3,483,036
Chapman Valve Mfg. Co., Indian Orchard, Mass.	145,549	121,817	462,280	231,465
Douglas Aircraft Co., Santa Monica, Calif.	3,899,478†	985,368	7,288,335	2,382,159
Easy Washing Machine Corp., Syracuse, N. Y.	55,110	64,819	235,456	208,061
Electrolux Corp., New York	197,115	284,389	1,094,675	1,113,000
Evans Products Co., Detroit	124,540	156,564	109,151	53,995
Ex-Cell-O Corp., Detroit	741,692	193,685	1,387,727	530,514
Gabriel Co., Cleveland	15,291*	12,260	46,710*	19,726
General Railway Signal Co., Rochester, N. Y.	106,555†	113,822†	344,474	94,534
Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.	37,510†	111,175†	337,955	305,088
Holland Furnace Co., Holland, Mich.	841,755	640,560	1,104,139	773,804
Hupp Motor Car Corp., Detroit	77,407*	162,077*	221,903*	641,294*
Kalamazoo Stove & Furnace Co., Kalamazoo, Mich.	296,677	109,381	362,161	20,541*
North American Aviation Inc., Inglewood, Calif.	970,900	2,267,935	3,338,538	5,049,617
Oliver United Filters Inc., San Francisco	87,692	70,717	189,452	58,201
Packard Motor Car Co., Detroit	1,336,698*	1,009,476*	1,439,064*	2,050,092*
Pressed Steel Car Co. Inc., Pittsburgh	312,389	206,114*	1,286,803	621,584*
Square D Co., Detroit	357,872†	257,828†	1,263,002	566,209†
Steel Products Engineering Co., Springfield, O.	221,193	135,841	412,024	311,098
Studebaker Corp., South Bend, Ind.	499,814*	395,385*	457,495	378,948
Thompson Products Inc., Cleveland	560,802	292,618	1,608,704	938,673
United-Carr Fastener Corp., Cambridge, Mass.	200,394†	63,932†	462,006	288,228
Universal-Cyclops Steel Corp., Bridgeville, Pa.	287,432	199,676	749,778	447,412
Warner & Swasey Co., Cleveland	668,855	433,071	2,805,776	1,009,706
White Sewing Machine Corp., Cleveland	96,886	101,623	320,721	254,898
Yellow Truck & Coach Mfg. Co., Pontiac, Mich.	785,760	368,276	3,506,869	1,788,137

*Loss; †for 16 and 40 weeks respectively; ‡period ended Aug. 31; †indicated; ‡before acquisition of Kollsman Instrument Co.; ††before taxes.

New Record Made for October Ingot Production

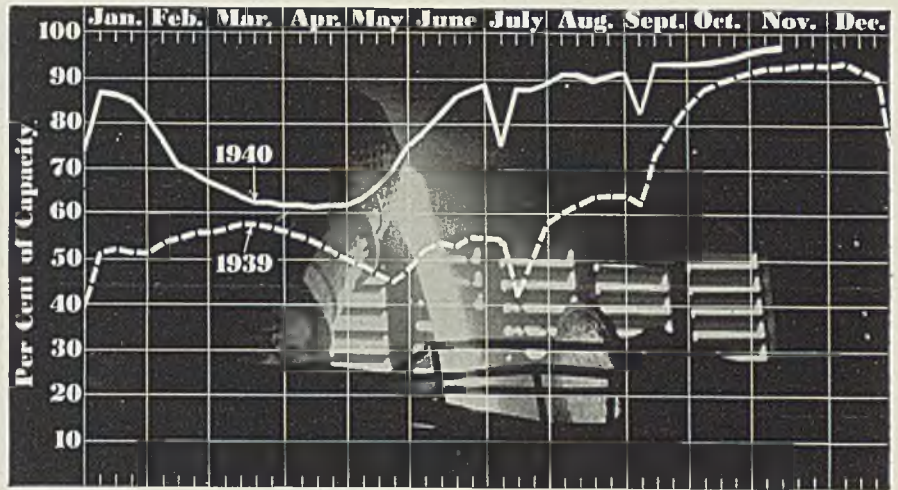
■ A new record for monthly production of open-hearth and Bessemer steel ingots was established in October, with 6,461,898 net tons, according to the American Iron and Steel Institute. This was nearly 10 per cent above September's, 5,895,232 tons, and more than 5 per cent over the prior record of 6,147,783 tons, in November, 1939. Output in October, 1939, was 6,080,177 tons.

Average production per week in October was 1,458,668 tons, compared with 1,377,391 tons in September, and 1,372,500 tons in October, last year.

Production attained an average rate of 96.10 per cent of capacity, up from 90.75 per cent in September and 89.75 per cent in October, 1939. In November, 1939, the industry operated at an average rate of 93.71 per cent.

The average of STEEL's weekly estimates of production in October was 95 per cent, close to the actual 96.10.

Total production for ten months this year was 52,663,361 tons; in the corresponding period of 1939 it was 39,615,189 tons. Weekly average production this year to Nov. 1 was 1,208,706 tons and for the same period last year 912,162 tons.



PRODUCTION... Steady

■ STEELWORKS operations last week continued at 96½ per cent. Two districts made small increases, five declined slightly and five held at unchanged rates. A year ago the rate was 93 per cent; two years ago it was 61½ per cent.

Cincinnati—Unchanged at 94 per cent, with the same schedule indicated for this week.

St. Louis—Held at 85 per cent, with 22 open hearths in production.

Birmingham, Ala.—Continued at 100 per cent with 24 open hearths active.

Pittsburgh—Advanced 2 points to 97 per cent, an all-time high.

Wheeling—Sustained at 98½ per cent for the second week.

New England—Loss of 5 points to 85 per cent resulted from necessity for open-hearth repairs.

Buffalo—Interruption for furnace repair caused a decline of 2 points, to 93 per cent.

Central eastern seaboard—Production was steady at 94 per cent for the second week.

Chicago—Dropped 1 point to 97 per cent as repairs to furnaces caused interruptions.

Detroit—One open hearth was shut down for ten-day repairs and another was suspended part of the week, the rate dropping 2 points to 93 per cent.

Cleveland—Taking off two open hearths for repair caused a decline of 3½ points to 86½ per cent.

Youngstown, O.—Addition of an open hearth by Republic Steel Corp. lifted the rate 1 point to 92 per cent.

Steel Ingot Statistics

Period	Calculated Monthly Production—All Companies—		Open Hearth—		Bessemer—		Total—		Calculated Weekly Number of production, all weeks
	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	
1940	Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.								
Jan.	5,369,601	86.40	285,714	56.10	5,655,315	84.11	1,276,595	4.43	
Feb.	4,203,508	72.37	205,527	43.19	4,409,035	70.16	1,064,984	4.14	
March	4,073,196	65.54	191,559	37.62	4,264,755	63.42	962,699	4.43	
April	3,798,371	63.11	176,335	35.76	3,974,706	61.04	926,505	4.29	
May	4,582,694	73.74	258,709	50.80	4,841,403	72.00	1,092,867	4.43	
June	5,228,529	86.88	304,381	61.72	5,532,910	84.97	1,289,723	4.29	
July	5,272,708	85.03	322,362	63.44	5,595,070	83.40	1,265,853	4.42	
Aug.	5,663,363	91.13	369,674	72.59	6,033,037	89.72	1,361,859	4.43	
Sept.	5,530,044	92.10	365,188	74.22	5,895,232	90.75	1,377,391	4.28	
Oct.	6,053,845	97.41	408,053	80.13	6,461,898	96.10	1,458,668	4.43	
10 mos.	49,775,859	.....	2,887,502	.....	52,663,361	79.64	1,208,706	43.57
1939	Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.								
Jan.	3,413,783	55.35	165,080	27.22	3,578,863	52.83	807,870	4.43	
Feb.	3,149,294	56.55	219,621	40.10	3,368,915	55.07	842,229	4.00	
March	3,621,177	58.71	217,950	35.93	3,839,127	56.67	866,620	4.43	
April	3,122,418	52.27	230,356	39.22	3,352,774	51.11	781,532	4.29	
May	3,104,697	50.34	190,467	31.40	3,295,164	48.64	743,829	4.43	
June	3,314,012	55.48	209,868	35.73	3,523,880	53.71	821,417	4.29	
July	3,308,029	53.75	256,798	42.43	3,564,827	52.74	806,522	4.42	
Aug.	3,965,515	64.29	276,479	45.58	4,241,994	62.62	957,561	4.43	
Sept.	4,436,792	74.45	332,676	56.77	4,769,468	72.87	1,114,362	4.28	
10 mos.	37,062,402	.....	2,552,787	.....	39,615,189	.....	912,162	43.43
Oct.	5,626,685	91.22	453,492	74.77	6,080,177	89.75	1,372,500	4.43	
Nov.	5,694,788	95.34	452,995	77.12	6,147,783	93.71	1,433,050	4.29	
Dec.	5,468,880	88.87	353,134	58.35	5,822,014	86.13	1,317,198	4.42	
Total	48,226,070	66.43	3,358,916	47.05	51,584,986	64.70	989,355	52.14	

The percentages of capacity for 1939 are calculated on weekly capacities of 1,392,331 net tons open hearth ingots and 136,918 net tons Bessemer ingots, total 1,529,249 net tons; based on annual capacities as of Dec. 31, 1938, as follows: Open hearth ingots, 72,596,153 net tons; Bessemer ingots, 7,138,880 net tons.

The percentages of capacity operated for 1940 are calculated on weekly capacities of 1,402,899 net tons open hearth ingots and 114,956 net tons Bessemer ingots, total 1,517,855 net tons; based on annual capacities as of Dec. 31, 1939 as follows: Open hearth ingots, 73,343,547 net tons; Bessemer ingots, 6,009,920 net tons.

District Steel Rates

District	Percentage of Ingot Capacity Engaged In Leading Districts		Engaged
	Week ended Nov. 9	Change	
Pittsburgh	97	+ 2	94 48
Chicago	97	- 1	91 58
Eastern Pa.	94	None	84 35
Youngstown	92	+ 1	93 66
Wheeling	98.5	None	93 64
Cleveland	86.5	- 3.5	87.5 77
Buffalo	93	- 2	90 49
Birmingham	100	None	94 68
New England	85	- 5	90 72
Cincinnati	94	None	87 75
St. Louis	85	None	77 51.5
Detroit	93	- 2	100 82
Average	96.5	None	93 61.5

MEN of INDUSTRY

■ HARRY G. MORROW, former vice president and general manager of sales, Central Tube Co., has been appointed manager of sales for conduit and standard pipe, Spang Chalfant Inc., with headquarters in the Grant building, Pittsburgh. Mr. Morrow had been associated with Central Tube since 1909, the activities of which company were discontinued in February of this year. The former pipe stock accounts of Central Tube are now serviced by Spang Chalfant.



Harry G. Morrow

O. E. Ostrom, formerly associated with Carnegie-Illinois Steel Corp. and Steel Sales Corp., St. Louis, has joined Sheffield Steel Corp., Kansas City, Mo.

E. R. Perry has been appointed executive assistant to the president, Boeing Aircraft Co., Seattle. The past three years he has been a management executive with Talon Inc., Meadville, Pa.

Jackson H. Beyer has joined the technical staff of Battelle Memorial institute, Columbus, O., and will be associated with the nonferrous metallurgy division. Mr. Beyer is a member, American Institute of Mining and Metallurgical Engineers.

Campbell Wood has been named director of Nash-Kelvinator Corp.'s newly opened office in Washington. He also has been appointed assistant to the president of the corporation.

Paul B. Tonnar has been appointed chief engineer, Andrews Steel Co., Newport, Ky. He formerly was associated with Republic Steel Corp. and Arthur G. McKee & Co., Cleveland.

Henry E. Hund has been elected president and general manager, Reo Motors Inc., Lansing, Mich. He formerly was vice president and general manager, Briggs Mfg. Co., Detroit, and at one time was an officer of Murray Corp.

Joseph H. Lee, associated with the Shell Oil Co. Inc., New York, the past 18 years, and since 1939 manager, lubrication department, has been placed in charge of all lubricant sales east of Rocky Mountains.

M. E. Morgan, open-hearth, blast furnace and coke works superintendent at Gulfsteel division of Republic Steel Corp., has been promoted to superintendent of blast furnaces and coke works for the

Youngstown district. George Cain, of the Cleveland division, has been named superintendent of open-hearth furnaces at Gadsden, Ala., and W. H. Winton has been made blast furnace and coke works superintendent there. Mr. Winton formerly was assistant superintendent of blast furnaces and coke works at Cleveland.

Walter H. Bowes, founder and chairman of the board, Pitney-Bowes Postage Meter Co., Stamford, Conn., has retired from active service. He will continue as consultant and adviser.

E. J. Hunt, formerly general staff master mechanic of Chrysler Corp., Detroit, has been appointed operating manager in charge of the Chrysler tank arsenal. He has been associated with Maxwell and Chrysler organizations since 1912, and has served in practically every machine and production department in both companies. The past two years he



E. J. Hunt

has been active on the staff of Herman L. Weckler, vice president and general manager, as consultant on machinery and production methods.

R. E. Griffin, veteran employe of Oldsmobile, and since 1921 in charge of distribution, has been promoted to production manager. T. R. Taffee succeeds Mr. Griffin as distribution manager, and L. J. Culver, distribution manager at the Linden, N. J., assembly plant, will take over Mr. Taffee's duties as assistant distribution manager.

G. B. Troxell has been appointed manager of ordnance, Bethlehem Steel Co., Bethlehem, Pa. Associated with Bethlehem since graduation from Lafayette college in 1916 Mr. Troxell has served in the operating, metallurgical and sales divisions. He returned to this country last July after spending several months in Europe for Bethlehem.

Ralph H. Rowland, sales manager, and Charles E. Dewar, superintendent, Champion Spark Plug Co., Toledo, O., have been made vice presidents of the company. Mr. Dewar has been given charge of production in all plants, including British and Canadian units. Charles L. Corwin has been appointed sales manager.

C. E. Bales, vice president, Iron-ton Fire Brick Co., Ironton, O., was elected president, Ohio Ceramic Industries association, at its annual meeting in Columbus, O., Nov. 1-2. Other officers elected include Harry Callahan, U. S. Quarry Tile Co., as vice president; E. E. Hillyer, Clay City Pipe Co., as treasurer, and Prof. H. E. Nold, Ohio State university, as secretary.

H. J. Berman has been made works manager, A. J. Lindemann & Hoverson Co., Milwaukee. He formerly was associated with Edison General Electric Co., Chicago. H. F. Muenchow, heretofore acting superintendent, has been named superintendent, and Paul Gerdes has been placed in charge of the enameling and stamping division. Fred Kimes is now manager of the sheet metal and welding department. He previously was with Prentiss-Wabers Co., Wisconsin Rapids, Wis.

Carnegie-Illinois Steel Corp., Chicago, announces the following personnel changes at its Gary, Ind., works:

C. J. Smith, superintendent of the maintenance division, becomes

STEEL

assistant to general superintendent in charge of engineering and maintenance. T. R. Miller succeeds Mr. Smith as superintendent of maintenance division. He formerly was co-ordinator of standard costs and budget supervisor. W. S. MacNabb, heretofore assistant division superintendent of open hearths and central mills, succeeds Mr. Miller with the title of assistant to general superintendent, co-ordinator of standard costs and budget supervisor. Donald Petersen has been named to the newly created post of superintendent of transportation.

Robert M. Gaylord, president, Ingersoll Milling Machine Co., Rockford, Ill., has been nominated for president of the Illinois Manufacturers' association. Mr. Gaylord is now first vice president and has been a director of the association several years. The result of the election will be announced at the forty-seventh annual dinner meeting of the association, Dec. 3, at the Stevens hotel, Chicago.

Other officers nominated are: First vice president, O. M. Burton, Burton Dixie Corp., Chicago; second vice president, H. G. Myers, Gardner-Denver Co., Quincy, Ill.; treasurer, Sterling Morton, Morton Salt Co., Chicago.

Among directors nominated for two years are C. S. Davis, Borg-Warner Corp., Chicago; G. Cook, Kimball, United States Steel Corp. of Delaware; August Kochs, Victor Chemical Works, Chicago; L. L. Munn, Arcade Mfg. Co., Freeport, Ill.; C. B. Nolte, Crane Co., Chicago; L. G. Sever, Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; D. P. Sommer, Keystone Steel & Wire Co., Peoria, Ill., and Charles D. Winan, Deere & Co., Moline, Ill.

Irving S. Olds, chairman of the board, United States Steel Corp., New York, will be one of the speakers at the dinner.

Pig Iron Estimates Modified Slightly

Actual output of coke pig iron in United States in October, according to production reports from operators of the nation's 231 potential blast furnaces, aggregated 4,425,869 net tons, an all-time high. This was an increase of 263,318 tons or 6.3 per cent over September's total, 4,172,551 tons.

Average daily output for October was 143,093 tons, compared with 139,085 tons in the preceding month. Increase per day was 4008 tons or 2.88 per cent. Percentage increase in daily production was smaller than for the month, because October was one day longer than September.

Aggregate production in first ten months this year was 37,952,300 tons, with daily average for the

period 124,434 tons. It was the first time this year that output in the period since Jan. 1 exceeded that in 1937's corresponding period.

Operating rate last month was 94.1 per cent, up 2.6 points from 91.5 per cent in September.

Stack changes not previously reported: New Jersey Zinc Co.'s Palmerton No. 1, put in blast in October; and Palmerton No. 2, blown out. Both are merchant furnaces. Total stacks active Oct. 31 remained 196.

These revised figures are essentially as reported in STEEL, Nov. 4, p. 24, in a compilation including estimates on production for the last day or two of October.

Paul Macklin, Son, and Superintendent, Drowned

Paul M. Macklin, 53, executive vice president and general manager, Wickwire Spencer Steel Co., New York; his son, John Macklin, 27, foreman at the company's Buffalo plant, and George W. Nelson, 48, superintendent of the Buffalo plant, were drowned Nov. 6 in a lake 80



Paul M. Macklin

miles north of Greenville, Me., while on hunting trip in company with a dozen others, including several executives of the company. Bodies were recovered the following day.

Paul Macklin, native of Worcester, Mass., and a graduate of Clark university, that city, became affiliated with Wickwire Spencer in Worcester in 1918, and had been executive vice president and general manager since 1926. The younger Macklin joined the company following graduation from Syracuse university. Mr. Nelson, a graduate of Worcester Polytechnical institute, was superintendent at the Goddard works, Worcester, before taking charge of operations at Buffalo some months ago.

Died:

CHARLES L. ALLEN, 82, chairman of the board, Norton Co., Worcester, Mass., in Worcester, Nov. 4. He joined the company in 1881 as a bookkeeper and in 1885 when the Norton Emery Wheel Co. was organized he became its general manager. He was made secretary



Charles L. Allen

and director in 1892 and in 1912, treasurer, relinquishing the secretaryship. Seven years later when the Norton Co. was formed Mr. Allen was elected president and general manager. He retired from administrative leadership of the company seven years ago and became chairman of the board.

Mr. Allen was a member of the St. Lawrence Waterway commission and was active in civic work in Worcester. In 1931 he was decorated with an honorary medal by the King of Sweden for aid given Swedish immigrants to America.

Charles L. Cameron, 60, Newark, N. J., Nov. 1, in Schenectady, N. Y. He was sales engineer for Monarch Machine Tool Co., Sidney, O., and Baker Bros., Toledo, O.

Carl A. Edlund, president and treasurer, Edlund Machine Co. Inc., Cortland, N. Y., in that city, recently. He had held that position since the death of his father, founder of the company, in 1931.

Thomas F. Howarth, 77, vice president, Simonds Saw & Steel Co., Fitchburg, Mass., Nov. 2, at his home in that city. He joined the Simonds company in 1880, and seven years later opened the company's San Francisco office, remaining there ten years before returning to Fitchburg.

Windows of WASHINGTON



By L. M. LAMM

Washington Editor, STEEL

Congressional Distribution Little Changed by Election.

Bolivian Tin Concentrates Bought by Metals Reserve Co.

Steelworkers Hold No Special Status Under Draft Law.

Business Upswing Continued Throughout October.

WASHINGTON

■ POLITICAL complexion of congress was little changed by last week's election. Slight gains in the senate were made by the Republicans while the Democrats netted nine seats in the lower house.

Virtually complete returns indicate the senate will include 28 Republicans, a gain of four, 66 Democrats, one Independent and one Progressive. The house will include 162 Republicans, 267 Democrats.

This result presages no vital changes in the New Deal's domestic policies, but rather portends "some more of the same." On the basis of the record of the past two years, the congress is likely to be a fairly independent body, with conservative Democrats frequently joining Republicans in opposition to radical legislation.

Expect Few New Experiments

Many observers believe the temper of the new congress will be to perfect and revise accepted social reforms rather than to embark on new experiments. This belief is heightened by the certainty that foreign affairs will demand increasing attention.

Casualties among conservative and New Deal congressmen were about equally divided. In Indiana, the New Deal's whip, Senator Sherman Minton, was replaced by a conservative Republican. In Delaware, Senator John G. Townsend Jr., a Republican who had opposed the New Deal vigorously, was defeated by a New Deal candidate. In Wisconsin, Senator LaFollette, Progressive, nosed out Fred H. Clausen, a Republican.

In Ohio, Representative Rautzohn, Republican member of the house committee investigating the national labor relations board, and ready critic of the administration, was defeated. But in New York, James Fay, the candidate selected by the President in 1938 to purge John J. O'Connor, anti-New Deal chairman of the house rules committee, was supplanted by a Republican.

In the face of the impressive electoral vote rolled up by the President's third term candidacy, the congressional vote of the minority party held up remarkably well.

The general pattern of Mr. Roosevelt's popular vote indicates the world situation tipped the scales in his favor. Mr. Willkie ran best in the central section where domestic issues and the third term issue took precedence over concern for a continuity of our foreign policies.

As in the past two elections, the class cleavage nurtured by the New Deal also was evident. Supporting Mr. Roosevelt were the unemployed, workers in the low-wage brackets, big city political machines, government jobholders and, of course, the southern states. The industrial sections of Pennsylvania, Ohio, Michigan, New York, Illinois, Indiana, and New England cast heavy votes for the President.

Supporting Mr. Willkie were a majority of farmers, older employes who own their homes and who have accumulated some savings, investors, professional people, executives and higher-bracket employes in business and industry. Significant was a swing of a larger portion of the independent farm vote to Mr. Willkie, despite the farm benefits passed

out by the present administration.

Compared with 1936, when of a total of 44,156,256 votes, 27,476,673, or 62.22 per cent, were cast for Mr. Roosevelt, and only 16,679,583, or 37.78 per cent for the Republican candidate, the minority party's gains this year were impressive. Although a few scattered precincts remained to be counted when this was written, indications were for a vote of about 49,000,000. This was split in a 55 to 45 ratio between Mr. Roosevelt and Mr. Willkie. So close was the popular vote in pivotal states, that, according to Roger W. Babson, statistician of Wellesley, Mass., 1 per cent of the vote properly distributed would have thrown the election to Mr. Willkie.

TIN CONCENTRATES ARE PURCHASED FROM BOLIVIA

Jesse Jones, federal loan administrator, announced that contract had been completed and signed between the Metals Reserve Co. and tin ore producers in Bolivia for the purchase of tin ores and concentrates sufficient to produce 18,000 tons of fine tin a year for the next five years.

The Bolivian government guaranteed faithful performance of the contracts by the tin producers, and proper apportionment between the different mining interests. In order to be of assistance to the Bolivians in the matter of current exchange, the Metals Reserve Co. will advance up to 80 per cent of the value of the tin ores and concentrates on warehouse receipts at the ports of Arica and Antofagasta, Chile, from which ports the ores will be shipped.

STEELWORKERS NOT EXEMPT FROM MILITARY TRAINING

Rumors are prevalent that steel and its allied industries had been declared "essential" as far as the draft is concerned by army officials.

It is understood on high authority that no industry or branch nor any officers of any industry have been granted any special status. Draft

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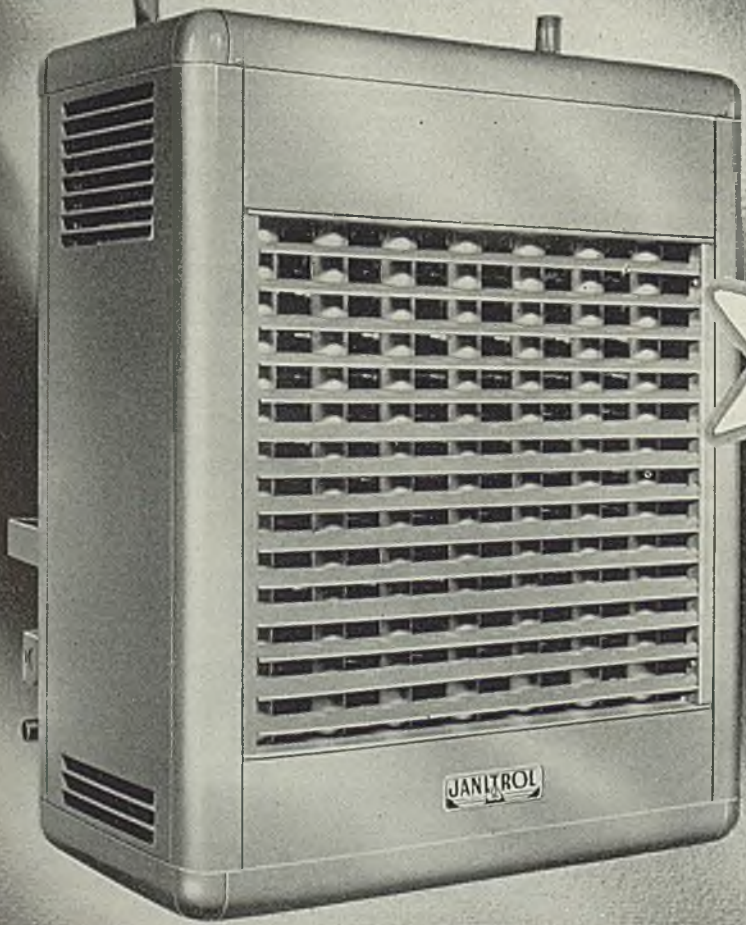
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officials state that there are "no blanket deferents"; each case is to be taken up on its own merit.

BUSINESS CONTINUED GAINS IN OCTOBER, SAYS JONES

Business activity in the United States continued on the upswing during October, according to Secretary of Commerce Jesse H. Jones.

Outlining the chief areas of the advance, the secretary said:

"Everywhere in American economic life the business record points to progress that is definite and specific. Following are seven important factors evidencing this conclusion.

"1. A sharp increase in new business pushed manufacturers' backlogs to a point assuring further industrial expansion through the winter months.

"2. Industrial production passed the previous record high of last December.

"3. Activity in the construction industry is at a new peak for the past ten years.

"4. Rising trend of income payments shared in by all groups of American population.

"5. Substantial increase in employment and payrolls.

"6. Large consumer purchasing of recent months reflects steadily rising buying power.

"7. Electric power output has reached a new record.

"The increased pace of the business upswing is signalized by the substantial gain in new orders received by manufacturers in recent months."

DEFENSE COMMISSION WILL MOVE TO NEW QUARTERS

Sometime between Nov. 15 and Dec. 1 the national defense commission is expected to move into its new building at the foot of Capitol Hill which was originally built as the home of the social security board.

In the federal reserve building, where the executive offices of the commission are now housed, the banking experts will regain some 13,000 square feet of floor space.

The defense commission's 800 employes are now spread through the federal reserve, munitions, north interior and Lafayette buildings and the Potomac apartments. Nearly 450 of the employes are in the munitions building and occupy 42,000 square feet of floor space. The 166 employes in the federal reserve building occupy about one-seventh of that structure's floor space. The commission's personnel division and part of its research and statistics department are working in the Potomac apartments, where the joint army and navy selective service board holds most of the office space.

All the scattered branches of the

commission are expected to be operating in the social security building within a week after the structure is completed. The social security building was originally scheduled for completion Jan. 1, 1941, but congress granted a special "speed-up" appropriation last spring to make the building available in November.

BRITISH STEEL INDUSTRY MAINTAINS PRODUCTION RATE

Despite intensive air attacks, British steel mills during August maintained the high level of operations of preceding months, and, in fact, are reported to have set new production levels, according to a report from the office of the American commercial attache, London. Steel consuming industries, too, are described as having experienced no delays because of lack of necessary supplies.

Demand in all principal producing centers continues unabated for practically all lines of material with the exception of tin plate, the demand for which is down in reflection of the curtailment of the manufacture and use of tin containers.

Tonnage of iron ore taken from British mines rose substantially in July and August with some mines reporting increases of as much as 60 per cent over the corresponding months of 1939. Arrivals of foreign iron ore are reported to be regular with the largest shipments coming from Spain, Brazil, Sierra Leone, and Newfoundland.

German airplanes shot down over England are providing scrap for British furnaces. Material so salvaged is being added to the 1000 tons or more of scrap being collected each week by some 3500 voluntary organizations throughout the country engaged in gathering waste material. An iron and steel scrap exhibition has been held in London to stimulate public interest and stress the importance of this material in the conduct of the war.

GERMANY TO DEVELOP BULGARIAN LEAD, ZINC ORES

Production of lead-zinc ores in the Rhodope mountains of Bulgaria by German interests is scheduled to begin soon, according to a report from American Consul Sydney B. Redecker, Frankfort-on-Main. This enterprise will constitute the leading lead-zinc mining venture in the country and will have an annual output of about 100,000 metric tons of ore with a metal content of between 10,000 and 15,000 tons, chiefly lead.

Concession for the exploitation of these important deposits was granted by the Bulgarian government to a mixed German-Bulgarian concern, the Pirin Co. The company at present employs 800 workers. Ore will be concentrated at the mines and

the concentrate shipped exclusively to Germany for further processing.

Recently Bulgaria has been notably active in conducting prospecting and other work looking to the development of the national mineral resources, which hitherto have been neglected due largely to lack of adequate capital and the technical skill requisite for their exploitation. The outbreak of the present war, seriously curtailing Europe's imports of nonferrous metals from overseas and creating an increased metal shortage in blockaded Continental countries, has given an appreciable impetus to interest in Bulgarian mineral resources on the part of both Bulgaria itself and metal consuming countries, particularly Germany. As there are no blast furnaces in Bulgaria and only limited facilities for processing ores, the entire ore production is reduced abroad. In view of this situation and for the promotion of production of its own minerals, Bulgaria has granted the duty-free importation of metal ingots, bars, and sheets produced abroad from Bulgarian ores.

NONFERROUS CASTINGS TOTAL IN 1939 LOWER THAN IN 1937

Manufacturers of rough nonferrous metal castings, except aluminum, reported moderate decreases in employment, wages, and production for 1939 as compared with 1937, according to preliminary figures compiled from returns of the census of manufactures for 1939.

This industry, as constituted for census purposes, embraces nonferrous metal foundries primarily engaged in manufacturing castings (not including die castings) of all nonferrous metals except aluminum.

The wage earners primarily engaged in manufacturing in this industry in 1939 were 9699, a decrease of 12.1 per cent compared with 11,032 reported for 1937, and their wages, \$12,210,365, were less than the 1937 figure, \$14,098,780, by 13.4 per cent. These decreases may be partially accounted for by the fact that the 1939 census of manufactures questionnaire, for the first time, called for personnel employed in distribution, construction, etc., separately from the manufacturing employes. It is not known how many of the wage earners reported for 1937 were engaged in distribution and construction and how many were engaged in manufacturing. Employes of the plants reported as engaged in distribution and construction activities in 1939 are not included in this preliminary report but will be included in the final report.

Value of products of the industry for 1939 amounted to \$55,639,398 which shows a decrease of 20 per cent from the \$69,528,424 reported for 1937.

Metal Trades Group Develops Machine Operator Training Plan

■ A PLAN for training inexperienced men to become machine operators and specialists has been developed by the National Metal Trades association, Chicago, to assist manufacturers to cope with the skilled labor shortage.

Plan includes instruction outlines for the following occupations: Assembly, upright drill press, radial drill press, engine lathe, turret lathe, hand milling machine, milling machine, cylindrical grinding, surface grinding, shaper, planer, vertical boring mill, horizontal boring machine and vertical turret lathe.

The program is designed for training in the manufacturing plant, under foremen or skilled employees designated to be instructors. It includes, in addition to the instruction outlines, suggestions to management in applying the program, suggestions to the instructor, and a proposed letter to be sent to the learners over the signature of a responsible executive of the company.

List Necessary Instruction Points

The instruction outlines deal neither with detailed information or facts to convey to the learners, nor how and when to present them. They are intended to serve as a check list of instruction points which must be covered if the new employe is to learn to do his job well.

For example, instruction points indicated in the outline for the engine lathe are: Machine description; nature of operations; care of ma-

chine; coolant—how, when and why used; safety; tools; machine controls; loading work; operation details; gaging; removing work; tool grinding.

"Any person, who has become proficient over a period of time," points out the association, "is apt to either overlook some of the essential details of his job when he is explaining them or to assume that the learner already knows them because the details seem so obvious. Whenever, therefore, the person who is responsible for training takes time to analyze the job in terms of what the learner needs to know and sets those things down to make sure the instructor does not overlook them, a better job will be done."

In addition to pointing out the elements of instruction to be covered, the instruction outlines indicate certain reference material for home study which may prove of considerable assistance, if used, by giving the learner information necessary to fully understand his job.

The references in *Machine Shop Technology*, the association's textbook for apprentices, furnish general information on the uses of the machine tool and methods of operation.

Outlines are available from the association, 122 South Michigan avenue, Chicago, either separately or complete with the *Machine Shop Technology* reference material.

■ Adoption of a special label to make possible for the public definite identification of "first quality" porce-

lain enamel was reported recently by the Porcelain Enamel institute, Chicago. The label will certify that products upon which it is displayed are genuine porcelain enamel, guaranteed by the manufacturer to conform to the institute's specification No. 161 and are glass-hard, stainless, rust-proof, odorless, fadeless and burn-proof.

"More Productive Tools Essential to Security"

■ "If we as a nation can fully appreciate the possibilities of progressively expanding productive equipment, we can have a progressive expansion in both standards of living and national defense." This conclusion is reached in a booklet, *The Dynamics of National Strength and Security*, published by Farrel-Birmingham Co. Inc., Ansonia, Conn.

"The part of wisdom lies in a reasonably scientific allocation of our productive effort to three objectives. One is the maintenance and improvement of our scale of living; the second is national defense; and the third is the continuous enlargement of our national productive plant. It is only by obtaining this latter objective that we can have a national living standard and a national defense on an expanding scale in the years ahead.

"It is readily shown that over our national existence we have made progress in almost exactly the same ratio as we have expanded the tools of production and the use of power machinery. . . ."

Both national income and total national employment, the booklet continues, are closely related to manufacturing.


Board of Experts Answers Questions at Enamellers' Forum



■ Featuring the annual forum of the Porcelain Enamel institute in Urbana, Ill., recently, was a quiz bee in which 127 questions asked by enamellers were answered by this board of experts. Members of the board, left to right: P. B. McBride, Porcelain Metals Corp., Louisville, Ky.; B. T. Sweely, Chicago Vitreous

Enamel Products Co., Cicero, Ill.; H. L. Cook, Norge division, Borg-Warner Corp., Chicago; J. E. Hansen, Ferro Enamel Corp., Cleveland; R. R. Danielson, Metal & Thermit Corp., Carteret, N. J.; F. E. Hodek Jr., General Porcelain Enamel & Mfg. Co., Chicago; J. C.

Eckel, Carnegie-Illinois Steel Corp., Pittsburgh; Fred Sutphen, American Rolling Mill Co., Middletown, O.; W. H. Pfeiffer, Frigidaire division, General Motors Corp., Dayton, O.; R. M. King, Ohio State university, Columbus, O.; J. E. Rosenberg, the O. Hommel Co., Pittsburgh. Photo, courtesy, *The Enamelist*.



Silicon-Molybdenum steel is tough when it is hard. Send for data on its use in chipping chisels, hammer bits, and similar applications.

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Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Bombing Plane Parts Displayed to Automakers.

Ford Rushes Work on Aircraft Engine Factory.

Economy Model Automobile Attracts Attention.

Defense Program Spurs Gage Builders' Activity.

DETROIT

■ SPREAD out on tables set up at one end of the Graham-Paige Motors administration building on West Warren avenue here, for the inspection of parts suppliers, are the "innards" of a bombing plane—not all of them, of course, but enough to give a clear idea of the complicated structure of a modern plane of this type. Forgings, castings, stampings, of aluminum, magnesium and stainless steel, they represent a cross section of what the automobile industry and its suppliers are getting set to manufacture in fulfillment of a half-billion dollar order for parts for 12,000 planes.

The display of parts has been arranged by the industry's committee for air defense which has established headquarters in the Graham plant under direction of C. C. Carlton of the Motor Wheel Corp. A staff of army air corps technical experts likewise is on hand to answer questions, in charge of Major Jimmie Doolittle.

Last week a good many representatives of parts suppliers had visited the exhibit and talked with the staff. They were shown blueprints of various assemblies, pictures of manufacturing methods, and they were being asked to inform the committee as to the extent of plant facilities for manufacturing certain items. The suppliers will be subcontractors on the work, furnishing parts to Briggs, Murray and Fisher Body, three companies which will handle most of the wing and fuselage subassemblies, in turn supplying them to the aircraft manufacturers.

The committee is anxious for as

many suppliers as possible to list their facilities for production of these parts. They need not be located in this area. Undoubtedly a good many companies some distance from Detroit would be in a position to furnish some of these castings, forgings, stampings and machined parts. A visit to the committee's headquarters here might prove a profitable investment.

Center of Defense Activity

The Graham plant, incidentally, is shaping up to be quite a center of defense program activity, car building being virtually discontinued. One phase involves contract machining work for elements of Wright aircraft engines, a considerable amount of special machinery having been installed for this work. Another is the recent announcement that the Tucker Aircraft Corp. will place its manufacturing program for \$6,000,000 worth of power-driven aircraft gun turrets in this plant. The Graham management also is angling for other defense contracts for the plant.

Ford equipment buyers are almost swamped with the vast amount of purchasing to be done for the new airplane engine plant now under construction, but they are feeding out orders for machinery and tooling daily in large numbers. They are working against time to get this plant going by early next year, and as one equipment seller expressed it, every time

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a Ford man releases 50 items he finds 60 more requests on his desk which require clearing.

The plan is to duplicate in its entirety the Pratt & Whitney Wasp engine, at least at first until production begins to roll. Ford even has a corps of men in the P&W plant at Hartford, so that as questions come up here, immediate contact can be made with these men and difficulties incident to tooling can be short circuited.

It is possible that after production gets under way, Ford engineers can make certain design changes here and there in the engine which will facilitate stepping up output. It is too early to tell what such changes might be, but with their flair for adapting designs to mass production, Ford engineers can be expected to introduce changes.

Kept currently in the background is a new Ford 12-cylinder airplane engine of about 1500-horsepower size, said to be similar in many respects to the Allison and Rolls-Royce engines, but rated by Ford far ahead of these engines, in fact far ahead of any aircraft engine known today. Should the demand develop, it appears likely this engine may be placed in production along with the Pratt & Whitney Wasps. Such a development, however, is still many months away. Models of the engine have been shown some visitors to the Rouge.

■ WHITE MOTOR CO. in Cleveland is busily engaged in turning out scout cars and "half tracs" for the army, during recent months having received three orders totaling \$45,329,937 for these vehicles. The cars are much alike except for the driving system. Scout cars have four regular wheels on which tires with bullet-sealing tubes are mounted. Drive is through both front and rear wheels. On the "half tracs" the rear axle and wheels are replaced with a half track or crawler tread built around the axle by means of a series of

sprockets and wheels. Both cars have the same chassis and body design. Each has a roller on the front end to help lift the car out of ditches. They are fully covered with armor plate. When subjected to fire there is a strong steel grille which folds down over the radiator and a steel plate with two port-holes which can be dropped down over the bulletproof windshield.

The cars mount three machine guns and will travel 50 miles an hour or more over fields or highways. They will climb a 60 per cent grade with full complement of eight men and equipment, without interference to the fuel system. The guns—two of 30 caliber and one of 50—are mounted on a special gun track which encircles the top rim of the car and permits 360 degrees of action.

■ SINCE Ford's recent introduction of an economy model—or "strip-tease" model as one jokester dubbed it—with a base price of \$665, activity has developed among other car builders to determine the feasibility of introducing similar "stripped" models. The Ford version eliminates all gadgets and accessories, such as bumper guards, dual horns, cigar lighters, twin visors, etc.; leaves off chromium plate and stainless steel trim, sub-

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce			
	1938	1939	1940
Jan.....	226,952	356,692	449,492
Feb.....	202,597	317,520	422,225
March...	238,447	389,495	440,232
April....	237,929	354,266	452,433
May.....	210,174	313,248	412,492
June....	189,402	324,253	362,566
July.....	150,450	218,494	246,171
Aug.....	96,946	103,343	89,866
Sept....	89,623	192,678	284,583
9 mos....	1,642,520	2,570,370	3,160,060
Oct.....	215,286	324,688	.....
Nov.....	390,405	368,541	.....
Dec.....	406,960	469,120	.....
Year....	2,655,171	3,732,608	.....

Estimated by Ward's Reports

Week ended:	1940	1939†
Oct. 12	107,957	75,860
Oct. 19	114,672	70,114
Oct. 26	117,080	78,210
Nov. 2	118,092	82,690
Nov. 9	120,948	86,200

†Comparable week.

stitutes painted moldings for wood grained treatment, and in general whittles the car down to bare transportation. The price of \$665 is about \$35 under the lowest previous price offered by Ford for 1941.

Greatest market for such cars is

in salesmen's fleets, although they also find good prospects in rural areas. There has been a feeling for a long time that a good market exists in this country for so-called "pure transportation" if some car builder would just devise the car and put a low enough price on it. Ford may have started a trend toward such a product, for last week General Motors' divisions were making studies of possibilities in offering models with no "accessory packages" and at considerably reduced prices. By stripping off accessories and nonessential decorative effects it should be possible to cut actual manufacturing cost from \$20-\$40, permitting reductions in retail price of from \$35 to \$60.

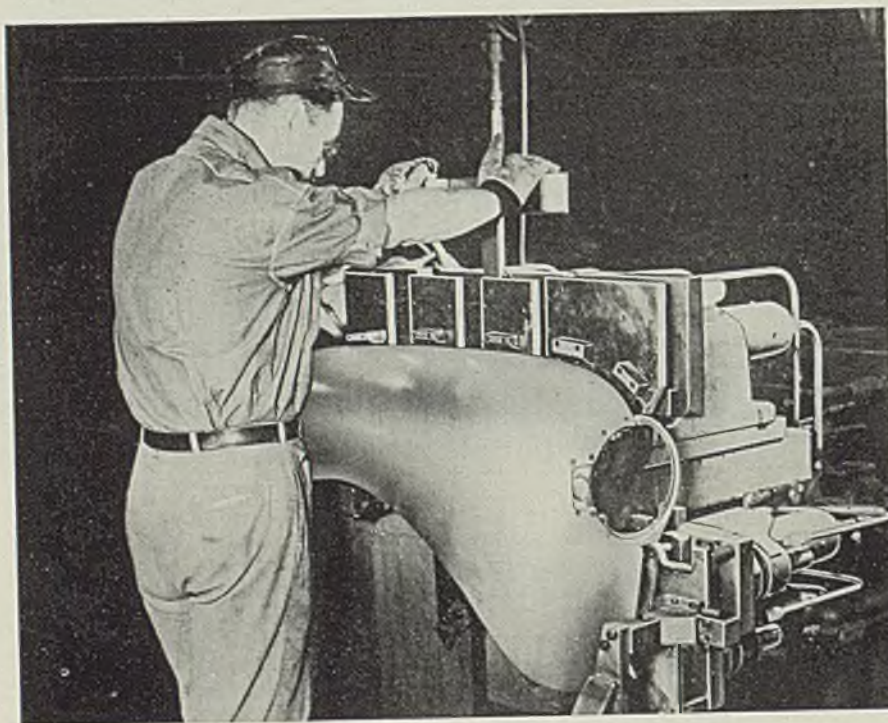
■ LARGELY as the result of defense program activity and foreign war orders, the gage industry this year has shown a phenomenal increase in business, reports from individual manufacturers showing gains ranging from 100 to 600 per cent over a year ago. Primary reason seems to be that the production of war materials to government specifications requires accurate gaging, with the result that companies formerly working to wide tolerances now are finding it necessary to acquire precision inspection tools. This is particularly true among many small shops which are coming into the defense program as subcontractors.

Heavy demand for gages has naturally taxed production resources of producers, particularly of ring, thread and plug gages. As a consequence the tendency is noted among purchasers toward specifying longer-life gages, such as the chromium plated and cemented carbide types.

Lincoln Park Tool & Gage Co. here is running 100 per cent ahead of last year. Detroit Tap & Tool Co. reports demand for thread, plug and ring gages 600 per cent ahead of last year and is just completing a plant addition to double production capacity. Dearborn Gage Co., supplying chrome-plated gage sets, reports business this year about triple the volume of last year, deliveries now about five months and order backlogs building up steadily. Taft-Peirce Mfg. Co. notes gage production has more than doubled the 1939 volume, with chrome plated and carbide types showing a somewhat higher proportion of the total than last year.

Hudson is offering a new accessory, the "vacumotive drive," eliminating clutch pedal operation but retaining manual gearshifting. With the attachment, the driver may shift through the various gear ratios, come to a stop, start ahead or go into reverse, all without touching the clutch pedal.

Speeds Punching of Fenders, Radiator Shells

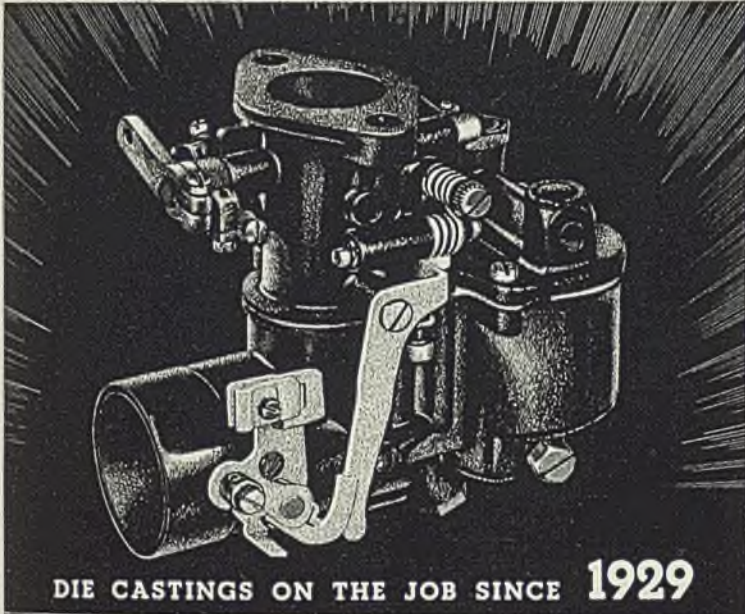


■ Two self-contained hydraulic punching fixtures, designed by Progressive Welder Co., Detroit, speed production punching of fenders and radiator shells for 1941 model automobiles. Individual hydraulic punching units mounted on die mounting brackets permit maximum flexibility for rearrangement to suit possible future design changes. Fixture has capacity for punching about 100 fenders or radiator shells an hour, each with 16 and 34 holes respectively

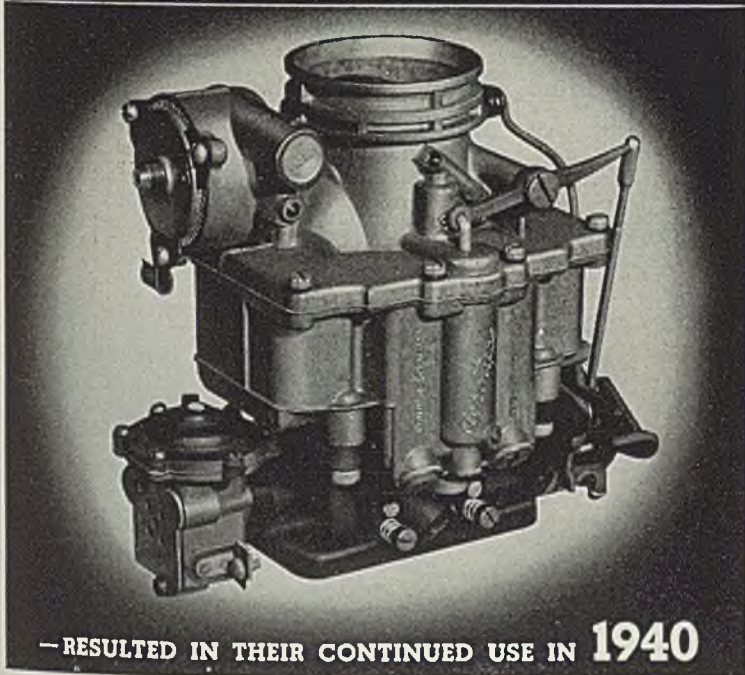
ECONOMIES

—DIE CASTINGS

REDUCE THE NUMBER
OF PARTS



DIE CASTINGS ON THE JOB SINCE 1929



—RESULTED IN THEIR CONTINUED USE IN 1940

● It was quite a shock when a prominent manufacturer of carburetors said that fewer ZINC Alloy Die Castings were used on 1940 models than on those produced in 1929. This was contrary to the increased use of die castings in all of the other major consuming fields.

The reason for this decrease is, however, food for thought for design engineers. To use the words of the carburetor manufacturer: "The fact that we are using less die cast parts in 1940 is no criterion, as die casting designs of today incorporate in one part what might have been two or three parts in 1929." Thus the fact that a comparatively simple carburetor in 1929 employed five ZINC Alloy Die Castings, and a complex carburetor in 1940 uses only four, is of special significance.

Parts reduction means less machining and assembling costs, as well as weight reduction. Have you considered ZINC Alloy Die Castings from this standpoint? Any commercial die caster will be glad to bring you up to date on the physical and economic advantages offered with this metal and production method — or write to The New Jersey Zinc Company, 160 Front St., New York City.



ZINC

ALLOY DIE
CASTINGS

This advertisement is the eleventh of a series. Copies of those preceding gladly mailed on request.

The Research was done, the Alloys were developed, and most Die Castings are made with
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Output of Steel Products For Sale Up 50 Per Cent

Steel products made for sale in September amounted to 4,446,555 net tons, according to the American Iron and Steel Institute. This was 202,510 tons less than in August, the reduction being due to fewer working days in September.

Output in the first nine months this year totaled 33,962,990 tons, 50 per cent more than 22,572,553 tons in the comparable period last year.

Production in September was at the rate of 95.4 per cent of finishing capacity; for nine months, 79.7 per cent.

Sheets again represented the largest tonnage in September, 936,780. Other leading items: Bars, 753,072 tons; plates, 368,684; heavy structural shapes, 310,944 tons.

Export shipments in September totaled 951,555 tons, or 21.4 per cent of output. Following is a tabulation beginning with April this year when the institute compiled figures

on a monthly as well as quarterly basis:

	Output	Exported	Pct.
April ...	3,005,218	371,532	12.37
May	3,576,860	476,761	13.33
June	3,802,485	601,668	15.8
July	4,173,839	835,385	20.0
Aug.	4,649,065	1,053,110	22.6
Sept. ...	4,446,555	951,555	21.4

In the first nine months this year 5,623,100 tons, or 16 1/2 per cent of output, was exported. In the full year 1939 the proportion was 6 per cent, and in 1938, 7 per cent.

AMERICAN IRON AND STEEL INSTITUTE				September - 1940							
Capacity and Production for Sale of Iron and Steel Products				PRODUCTION FOR SALE—NET TONS							
Description	Number of Companies	Items	Annual Capacity Net tons	Current Month			To Date (9 Months 1940)				
				Total	Per cent of capacity	Shipments	Total	Per Cent of capacity	Shipments		
Ingot, blooms, billets, slabs, sheet bars, etc.	24	1	xxxxxxx	631,948	xxx	355,789	108,115	3,892,954	xxx	1,859,053	823,226
Heavy structural shapes	8	2	5,205,300	310,944	73.0	55,638	xxxxxxxx	2,082,099	53.4	289,530	xxxxxxxx
Steel piling	4	3	328,000	25,371	94.5	4,610	xxxxxxxx	137,204	55.9	14,208	xxxxxxxx
Plates—Sheared and Universal	20	4	6,095,450	368,684	73.9	67,231	959	2,881,455	63.1	441,671	15,444
Skelp	8	5	100,007	100,007	xxx	28,814	29,564	566,980	xxx	108,878	203,152
Rails—Standard (over 60 lbs.)	14	6	3,647,600	79,113	26.5	24,825	xxxxxxxx	1,219,854	44.7	168,451	xxxxxxxx
Light (60 lbs. and under)	6	7	306,800	15,305	53.0	9,597	xxxxxxxx	86,540	37.9	32,981	xxxxxxxx
All other (Incl. girder, guard, etc.)	2	8	118,000	1,056	10.9	21	xxxxxxxx	19,098	21.6	2,403	xxxxxxxx
Splice bar and tie plates	15	9	1,300,200	29,017	27.3	887	xxxxxxxx	405,278	41.6	7,396	xxxxxxxx
Bars—Merchant	35	10	xxxxxxx	453,431	xxx	130,799	30,632	3,259,688	xxx	528,292	249,839
Concrete reinforcing—New billet	16	11	xxxxxxx	111,231	xxx	17,064	xxxxxxxx	246,796	xxx	222,268	xxxxxxxx
Rolled	18	12	xxxxxxx	12,344	xxx	1,021	xxxxxxxx	108,042	xxx	5,130	xxxxxxxx
Cold finished—Carbon	18	13	xxxxxxx	60,660	xxx	2,378	xxxxxxxx	482,788	xxx	12,969	xxxxxxxx
Alloy—Hot rolled	16	14	xxxxxxx	98,356	xxx	12,130	8,207	694,714	xxx	60,834	49,420
Cold finished	15	15	xxxxxxx	8,892	xxx	676	xxx	67,708	xxx	2,648	xxxxxxxx
Hoops and baling bands	5	16	xxxxxxx	8,158	xxx	545	xxxxxxxx	77,616	xxx	7,112	xxxxxxxx
TOTAL BARS	54	17	12,372,465	753,072	74.3	184,613	38,839	5,637,533	60.9	840,253	299,829
Tool steel bars (rolled and forged)	15	18	110,220	6,270	69.5	663	xxxxxxxx	50,802	61.6	4,254	xxxxxxxx
Pipe and tube—B. W.	13	19	1,851,860	107,915	71.2	6,564	xxxxxxxx	758,723	54.7	57,023	xxxxxxxx
L. W.	10	20	1,246,340	29,746	29.2	3,087	xxxxxxxx	256,404	27.5	26,018	xxxxxxxx
Electric weld	5	21	735,220	28,162	46.8	2,803	xxxxxxxx	214,241	38.9	22,808	xxxxxxxx
Seamless	15	22	3,159,240	169,860	65.3	45,936	xxxxxxxx	1,309,861	55.4	159,896	xxxxxxxx
Conduit	6	23	151,145	7,784	62.9	83	xxxxxxxx	53,314	47.1	1,450	xxxxxxxx
Mechanical Tubing	13	24	554,825	28,371	62.5	3,563	xxxxxxxx	206,400	49.7	16,430	xxxxxxxx
Wire rods	18	25	xxxxxxx	138,009	xxx	55,873	21,046	379,220	xxx	282,167	157,245
Wire—Drawn	37	26	2,255,210	131,846	71.4	16,976	1,255	1,050,590	62.2	150,077	8,331
Nails and staples	19	27	1,091,690	53,983	60.4	3,755	xxxxxxxx	4,50,038	55.1	48,418	xxxxxxxx
Barbed and twisted	16	28	458,270	17,861	49.8	6,986	xxxxxxxx	154,587	47.1	37,934	xxxxxxxx
Woven wire fence	15	29	772,790	13,503	21.5	118	xxxxxxxx	176,781	30.6	1,678	xxxxxxxx
Bale ties	11	30	119,050	6,115	62.7	93	xxxxxxxx	54,628	61.3	237	xxxxxxxx
All other wire products	5	31	27,030	473	21.4	-	xxxxxxxx	5,964	19.6	-	xxxxxxxx
Fence posts	13	32	147,485	4,314	35.7	118	xxxxxxxx	41,363	37.5	810	xxxxxxxx
Black plate	12	33	653,295	20,476	38.3	372	19	283,808	53.9	35,803	55,982
Tin plate—Hot rolled	9	34	1,201,960	30,286	30.8	1,767	xxxxxxxx	358,646	39.8	72,696	xxxxxxxx
Cold reduced	10	35	2,930,860	162,697	67.8	15,669	xxxxxxxx	1,741,385	79.4	279,659	xxxxxxxx
Sheets—Hot rolled	26	36	xxxxxxx	530,411	xxx	45,094	17,603	4,027,356	xxx	397,584	112,893
Galvanized	16	37	xxxxxxx	138,375	xxx	12,497	xxxxxxxx	1,023,025	xxx	124,011	xxxxxxxx
Cold rolled	18	38	xxxxxxx	219,416	xxx	4,855	xxxxxxxx	1,060,908	xxx	61,471	xxxxxxxx
All other	15	39	xxxxxxx	48,578	xxx	1,954	xxxxxxxx	421,578	xxx	28,789	xxxxxxxx
TOTAL SHEETS	27	40	13,255,610	936,780	86.3	64,488	17,603	7,132,865	71.9	601,859	112,893
Strip—Hot rolled	24	41	3,525,110	137,220	47.5	8,955	19,414	1,049,033	39.7	64,596	123,994
Cold rolled	35	42	1,313,360	70,404	65.5	1,467	xxxxxxxx	532,901	54.2	13,256	xxxxxxxx
Wheels (car, rolled steel)	5	43	424,395	14,603	42.0	42	xxxxxxxx	138,923	45.7	2,431	xxxxxxxx
Axles	5	44	472,280	10,903	28.2	26	xxxxxxxx	66,727	18.9	1,803	xxxxxxxx
Track spikes	11	45	327,275	6,434	24.0	126	xxxxxxxx	80,636	32.9	2,913	xxxxxxxx
All other	3	46	9,100	1,123	150.7	-	xxxxxxxx	7,935	116.5	-	xxxxxxxx
TOTAL STEEL PRODUCTS	134	47	xxxxxxx	4,446,555	xxx	951,555	233,324	33,962,990	xxx	5,623,100	1,780,130
Estimated total steel finishing capacity based on a yield from ingots of 69.9 %	-	48	53,946,300	xxxxxxx	95.4	xxxxxxx	xxxxxxx	xxxxxxx	79.7	xxxxxxx	xxxxxxx
Pig iron, ferro manganese and spiegel	26	49	xxxxxxx	566,136	xxx	53,178	124,024	4,156,479	xxx	422,861	1,113,296
Ingot moulds	4	50	xxxxxxx	48,609	xxx	751	xxxxxxxx	337,076	xxx	3,214	xxxxxxxx
Bars	10	51	160,600	2,890	22.0	-	138	22,407	18.6	106	1,643
Pipe and tubes	3	52	109,377	4,155	46.4	15	xxxxxxxx	29,887	36.5	688	xxxxxxxx
All other	3	53	71,180	1,048	18.0	301	223	9,037	17.0	1,861	2,326
TOTAL IRON PRODUCTS (ITEMS 51 to 53)	12	54	276,247	8,095	39.8	315	361	61,331	29.7	2,665	3,669

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current month 4,212,731 N.T. 95.4 % of Finishing Capacity. To date 32,182,860 N.T. 79.7 % of Finishing Capacity. The above tonnages represent 63.2 % of the ingots produced by companies whose products are included above.

Total Number of Companies Included - 153

National Machinery Holds Open House To Show What Makes Jobs

■ IF THE PEOPLE of Tiffin, O., do not understand the place of the machine in relation to their livelihood and their standard of living, it is not the fault of the National Machinery Co. This company held open-house Oct. 27 to 30 and thousands in all walks of life who attended had visible evidence that the machine, despite contentions by its detractors, creates jobs—and creates them on a vast scale.

First, the path of the visitors led through the production line. On all sides they saw machine tools and other equipment in operation in producing parts for the various types of machines that are built by National. These include automatic bolt, nut, rivet and wire nail making machines, high-speed forging presses and upset forging machines. All production units bore placards stating the amount of money the machines had cost. They also bore cards setting forth the name of the operator, and explaining the kind of work being done.

The path led past machines in process of assembly. These also bore placards identifying them as to purpose and customers.

Climax was a huge exhibition of

hundreds of different manufactured products that are part of every-day life and in the manufacture of which National machines play a part. Included were cameras, telephones, clocks, typewriters, office equipment, electric motors, electric refrigerators, washing machines, radio sets, farming machinery, grocers' scales, models of airplanes and many other widely diversified articles.

Industrial Relations Excellent

The inescapable inference was that the machines manufactured by National make jobs, not only at the National plant, but in thousands of establishments all over the country which turn out these products. Attention was directed to vital parts, without which these products could not exist, that were produced on National machines.

A large placard on the wall of the products exhibition room bore this thought-provoking statement: "The most important thing to every man is his job, so he should know how jobs are created. Every man, and particularly the young man, should know that his chance for a job is greatly increased by invention and

development and new enterprises."

The atmosphere in which the open-house was conducted was particularly favorable because of National's industrial relations. Keystone policy is that of keeping men on the payroll continuously. For many years National has made it a policy never to "fire" employes for any but the gravest offenses. When orders drop off—as during the depression—nobody is "fired." Instead, the work is shared. During the depths of the depression the work-week at National dropped as low as one and a half days, but all the men were sure at least of a living for themselves and families.

Another feature of National's industrial relations is avoidance of minor irritants. There are no "Don't" signs in the plant. About the only signs are those which bear the slogan "Quality Comes First."

In industrial relations the management functions with and through an employe-elected shop committee. The men do their own policing and see to it that company policies are executed. Another factor is that more than one-third of National's 300 employes are stockholders.

Then there is an unusually liberal policy whereby the company helps employes solve their individual problems. The management regards this as fundamental. It always is ready to advise and assist in financial and legal matters. While it has regular sick, accident and death benefits, and its own hospitalization plan, the disposition is to go to any lengths required when emergencies arise. Several men in the plant declare they owe their lives to treatment by medical and surgical specialists, brought by the company to Tiffin especially to treat them.

In other words, while there are regular plans that cover assistance to employes, they are subject to any "stretching" that may be required from time to time in unusual cases.

■ Fifteen thousand people visited the National Machinery Co.'s plant during a four-day open house. Plant was in operation to show guests how machinery is built—and how jobs are created



A Job for the "Rich People"

■ ONE of the things definitely established in the 1940 presidential campaign is that there exists today a class consciousness without precedent in this country. The eggs and tomatoes that were hurled at Willkie were not meant for him personally. They were aimed at him as the symbol of "the interests". They were the means of expressing an antagonism that is deeply felt by so many "poor people" against the "rich people" in general.

Anyone who has invited comments in recent years from men and women situated in the lower income brackets, and who has kept his ears open, particularly during the last few months, knows that these folk hold a grudge against the "rich people". They see them as exploiters of the poor. When the New Dealers castigate the "money-changers," "tories" and "princes of privilege" the poor hear the sort of talk that they like. Even a Roosevelt has to have some kind of a fire before he can fan it into a flame.

Many "poor people" believe, passionately, that one of the reasons why Roosevelt has been unable to do more for the underdog than he has is because the "rich people" are unwilling to co-operate with him.

While it is unfortunate that so few persons in the lower income groups are equipped mentally to understand simple economics, their sincerity, their patriotism and their desirability as American citizens cannot be questioned. They love their country, sing the national anthem with emotion and cheerfully register for the draft. They also love their families and want their fair share of the good things of life. Their discontent arises from a passionate conviction that the "rich people" are enjoying these things at their expense.

In view of this widely held conception one thing is sure. Roosevelt will continue to give every evidence of being on the side of the underdog, the common man. Period-

ically some sort of show will be put on to dramatize this idea. The effect may not be to stimulate confidence on the part of many individuals and groups of individuals who, through investing, and managing investments, provide the overwhelming majority of jobs in this country.

Yet, such Americans cannot lose confidence in this country. They will do everything they can to advance the interests of the country as a whole. They will do all that they can to work for national unity, particularly in times when disunity might prove suicidal.

They can work to this end more intelligently if they do it in the determination that the present widely held attitude toward the "rich people" be changed.

Who are the "rich people"? Why, they include almost anybody who lives in a smart residential section, who sends a son or daughter to an "ivy" league college, who belongs to a country club, who drives a higher-priced car. They need not be "rich"—they need only live on the "right" side of the tracks, enjoy the better things of life.

Every individual, every family in this group can do a great deal to eliminate class consciousness in this country. They can do it by returning to the old-fashioned virtues, by exercising sympathy, charity and understanding, right where they live, in their homes and in their communities. They can bring it about by demonstrating that neighbors are friends and that it is not necessary to go to a politician or government bureau when help is needed.

Unless the "rich people" are able to justify their place in the economic scale, they eventually will disappear in the United States just as they have in some other countries.

EC Kreutzberg

The BUSINESS TREND



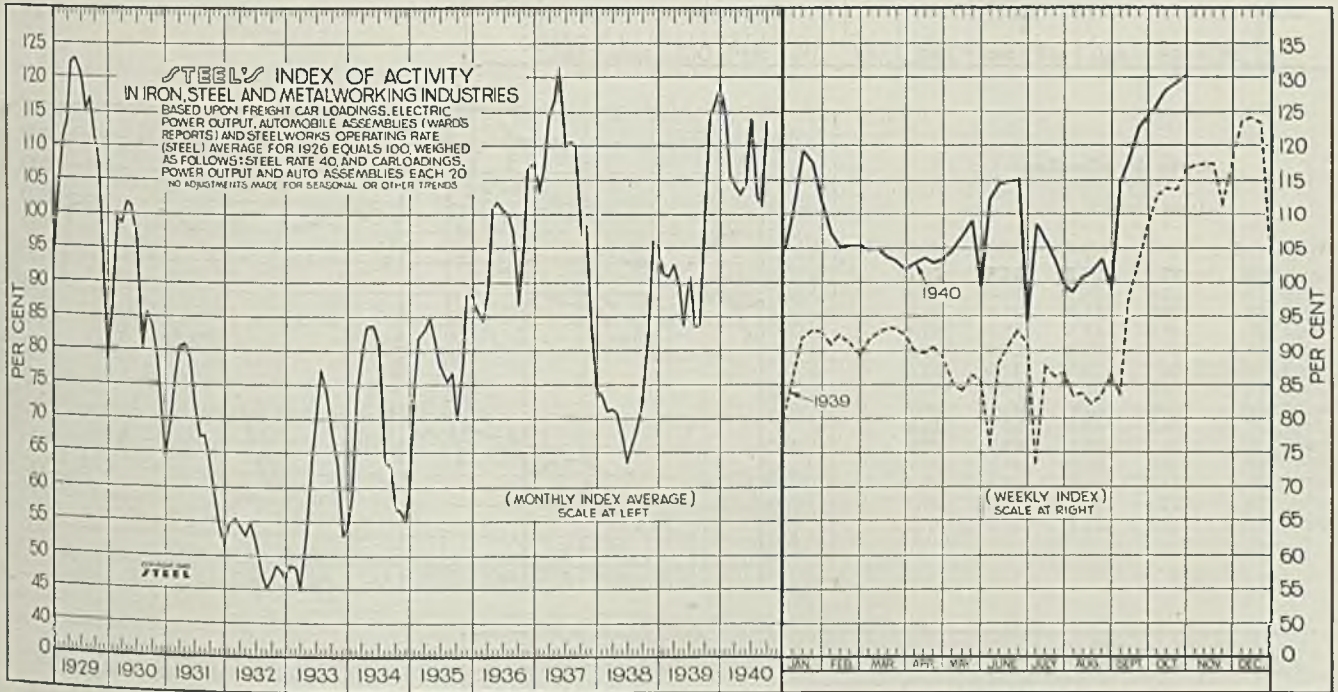
New Demand Continues Upward Tendency

INDUSTRIAL activity recorded further improvement during the latest period. Backlog of unfilled orders continue to expand as volume of incoming business exceeds output in many instances.

Inventory position of most consumers is substantially greater than earlier in the year but is not considered excessive due to the near capacity operations now maintained and prospects of further expansion in output over the coming months.

During the week ended Nov. 2 STEEL'S index of activity in the iron, steel and metal-working industries

edged upward to a new high level of 130.2. This represents a gain of 0.3 point over the previous period and compares with 117.1 in the like week a year ago. Steelmaking operations reached an all-time high on a tonnage basis of 96.5 per cent in the week of Nov. 2. Further gains in the national steel rate will be restricted due to the necessary furnace repairs. Order backlogs are sufficient to sustain the present high level of operations through the remainder of this year. Electric power output again moved into new high ground during the latest period.



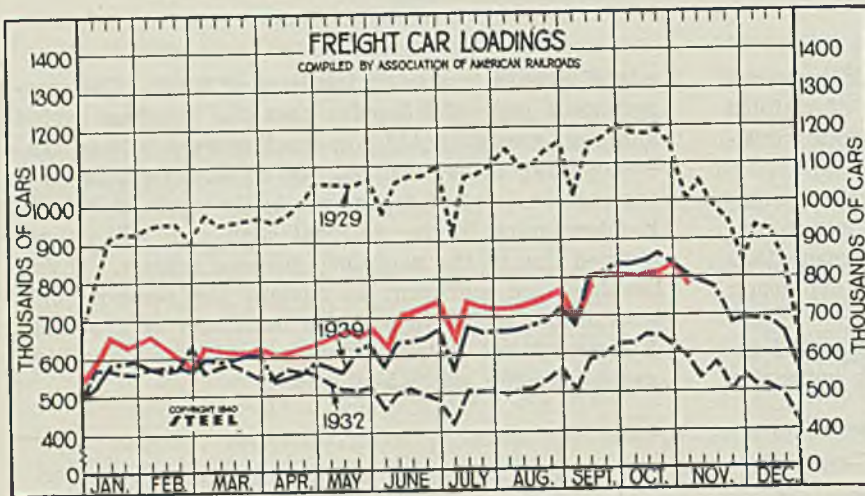
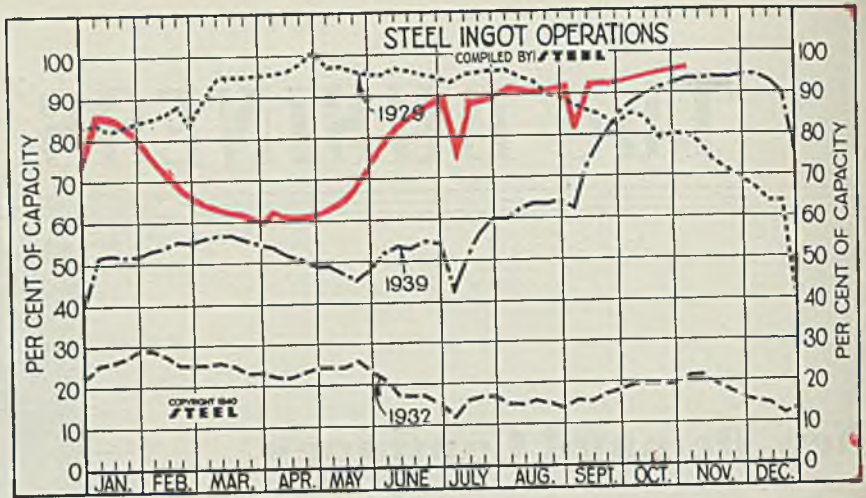
STEEL'S index of activity gained 0.3 points to 130.2 in the week ended Nov. 2:

Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Aug. 17	100.8	82.2	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
Aug. 24	101.4	83.4	Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
Aug. 31	103.5	86.3	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
Sept. 7	98.7	83.7	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
Sept. 14	114.9	97.5	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
Sept. 21	117.7	103.0	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
Sept. 28	122.8	107.9	July	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Oct. 5	124.4	112.5	Aug.	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Oct. 12	126.0	113.9	Sept.	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct. 19	128.3	113.6	Oct.	.....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Oct. 26	129.9	116.2	Nov.	.....	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Nov. 2	130.2	117.1	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
Aug. 3....	90.5	60.0	40.0	84.5
Aug. 10....	90.5	62.0	40.0	84.0
Aug. 17....	90.0	63.5	41.5	81.0
Aug. 24....	90.5	63.5	43.5	83.0
Aug. 31....	91.5	64.0	44.5	83.0
Sept. 7....	82.0	62.0	41.5	72.0
Sept. 14....	93.0	74.0	46.0	80.0
Sept. 21....	93.0	79.5	48.0	76.0
Sept. 28....	93.0	84.0	47.0	74.0
Oct. 5....	93.5	87.5	48.5	66.0
Oct. 12....	94.5	89.5	51.5	63.0
Oct. 19....	95.0	91.0	51.5	53.0
Oct. 26....	95.5	92.0	54.5	51.0
Nov. 2....	96.5	93.0	57.5	47.0



Freight Car Loadings

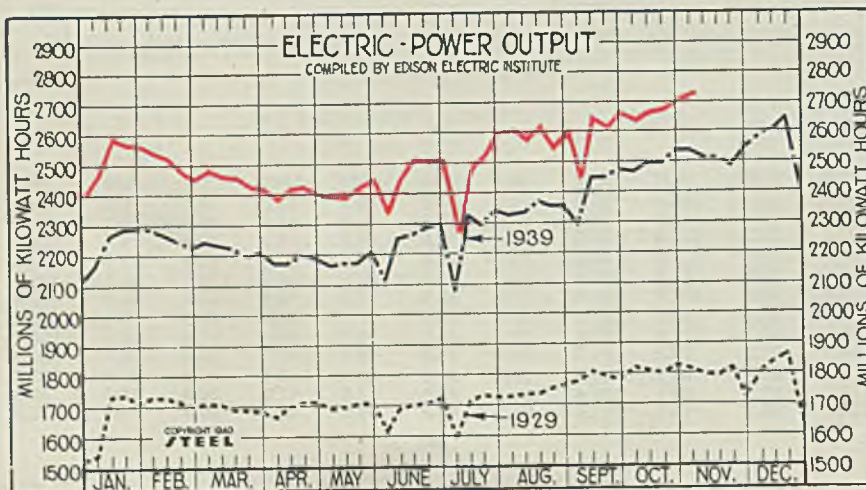
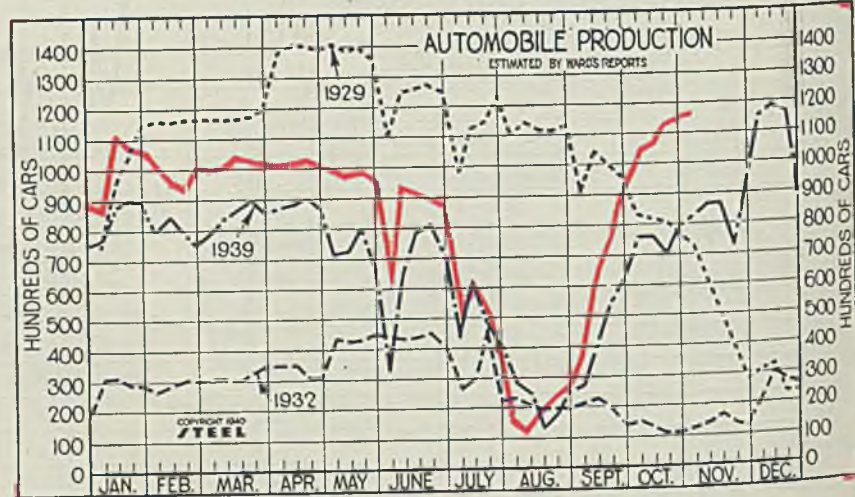
(1000 Cars)

Week ended	1940	1939	1938	1937
Aug. 3.....	718	661	584	770
Aug. 10.....	727	665	590	777
Aug. 17.....	743	674	598	781
Aug. 24.....	761	688	621	787
Aug. 31.....	769	722	648	805
Sept. 7.....	695	667	569	711
Sept. 14.....	804	806	660	827
Sept. 21.....	813	815	676	840
Sept. 28.....	822	835	698	847
Oct. 5.....	806	835	703	815
Oct. 12.....	812	845	727	810
Oct. 19.....	814	861	706	773
Oct. 26.....	838	834	709	772
Nov. 2.....	795	806	673	732

Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
Aug. 3....	17.4	28.3	14.8	78.7
Aug. 10....	12.6	24.9	13.8	103.3
Aug. 17....	20.5	13.0	23.9	93.3
Aug. 24....	23.7	17.5	18.7	83.3
Aug. 31....	27.6	25.2	22.2	64.2
Sept. 7....	39.7	26.9	17.5	59.0
Sept. 14....	66.6	41.2	16.1	30.1
Sept. 21....	78.8	53.9	20.4	28.0
Sept. 28....	95.9	62.8	25.4	45.8
Oct. 5....	105.2	76.1	37.7	72.0
Oct. 12....	108.0	75.9	50.5	89.7
Oct. 19....	114.7	70.1	68.4	91.9
Oct. 26....	117.1	78.2	73.3	90.2
Nov. 2....	118.1	82.7	80.0	89.8



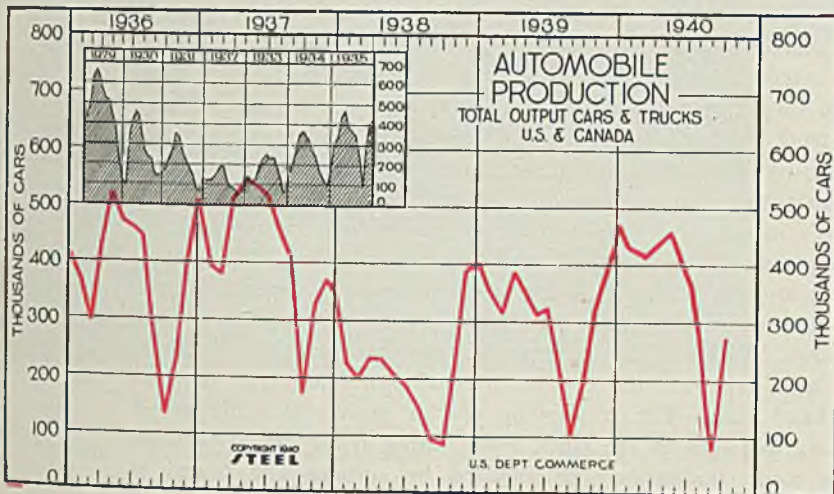
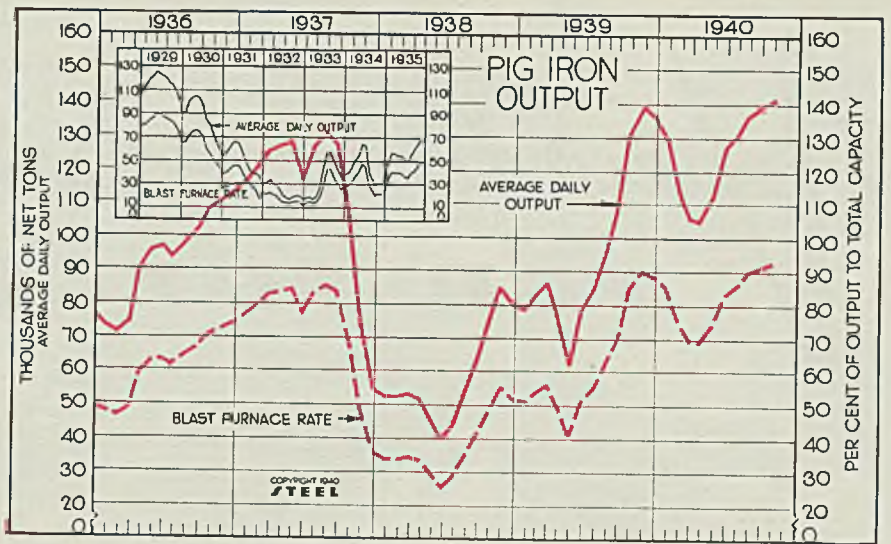
Electric Power Output

(Million KWH)

Week ended	1940	1939	1938	1937
Aug. 3....	2,605	2,325	2,116	2,262
Aug. 10....	2,589	2,333	2,134	2,301
Aug. 17....	2,606	2,368	2,139	2,304
Aug. 24....	2,571	2,354	2,134	2,295
Aug. 31....	2,601	2,357	2,149	2,321
Sept. 7....	2,463	2,290	2,048	2,154
Sept. 14....	2,639	2,444	2,215	2,281
Sept. 21....	2,629	2,449	2,154	2,266
Sept. 28....	2,670	2,470	2,139	2,273
Oct. 5....	2,641	2,465	2,154	2,280
Oct. 12....	2,665	2,495	2,183	2,276
Oct. 19....	2,687	2,494	2,214	2,282
Oct. 26....	2,711	2,539	2,226	2,255
Nov. 2....	2,734	2,537	2,207	2,202

Pig Iron Production

	Daily average			Blast furnace		
	Net Tons			Rate (%)		
	1940	1939	1938	1940	1939	1938
Jan.	129,825	78,596	52,201	85.4	51.0	33.6
Feb.	113,943	82,407	52,254	75.0	53.5	33.6
Mar.	105,502	86,465	53,117	69.5	56.1	34.2
Apr.	104,635	76,732	51,819	68.9	49.8	33.4
May	112,811	62,052	45,556	74.2	40.2	29.4
June	127,103	79,125	39,601	83.6	51.4	25.5
July	130,984	85,121	43,827	86.1	55.0	28.2
Aug.	136,599	96,122	54,031	89.9	62.4	34.8
Sept.	139,085	107,298	62,835	91.5	69.7	40.5
Oct.	141,426	131,053	74,697	93.0	85.2	48.0
Nov.	.....	138,883	85,369	.....	90.3	55.0
Dec.	.....	136,119	79,943	.....	88.5	51.4
Ave.	.....	86,375	51,752	.....	62.6	37.3



Automobile Production

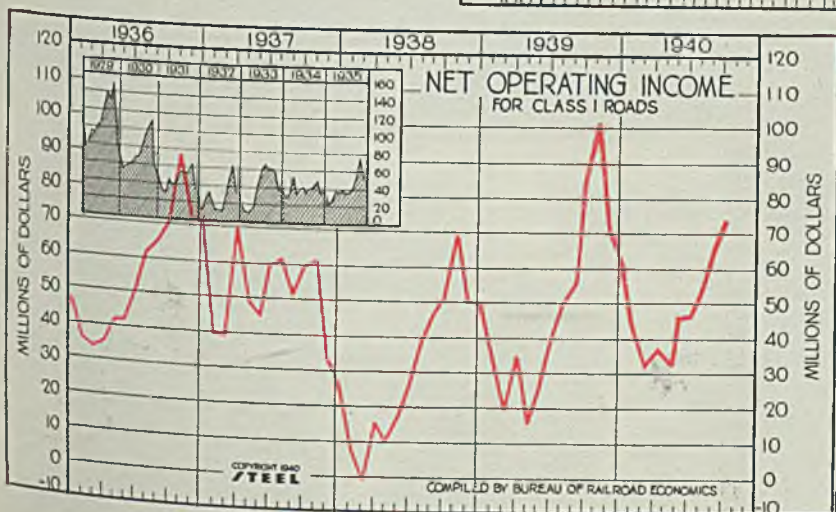
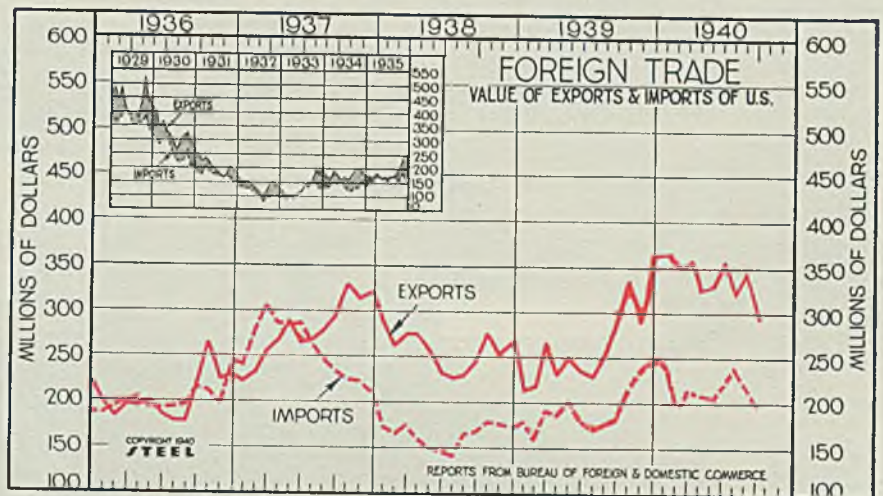
(Unit: 1000 Cars)

	1940	1939	1938	1937	1936
Jan.	449.3	357.0	227.1	399.2	377.2
Feb.	421.8	317.5	202.6	383.9	300.8
March	440.2	389.5	238.6	519.0	438.9
April	452.4	354.3	238.1	553.4	527.6
May	412.5	313.2	210.2	540.4	480.5
June	362.6	324.2	189.4	521.1	469.4
July	246.2	218.5	150.4	456.9	451.2
Aug.	89.9	103.3	96.9	405.1	275.9
Sept.	284.6	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

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	350.2	236.1	211.4	178.9
July	317.0	229.6	232.3	168.9
Aug.	349.9	250.8	220.5	175.8
Sept.	295.2	289.0	194.9	181.5
Oct.	.....	332.1	.....	215.3
Nov.	.....	292.7	.....	235.4
Dec.	.....	367.8	.....	247.0
Total	.....	\$3,177.0	.....	\$2,318.3



Class I Railroads Net Operating Income

(Unit: \$1,000,000)

	1940	1939	1938	1937
Jan.	\$45.57	\$32.89	\$7.14	\$38.87
Feb.	32.62	18.59	1.91*	38.78
Mar.	36.73	34.32	14.73	69.88
April	33.82	15.32	9.40	48.36
May	47.08	25.10	16.67	44.24
June	47.42	39.10	25.16	59.35
July	57.08	49.01	38.43	60.99
Aug.	66.01	54.59	45.42	50.76
Sept.	74.19	86.43	50.36	59.62
Oct.	.....	101.62	68.57	60.86
Nov.	.....	70.35	49.67	32.44
Dec.	.....	60.95	49.37	25.99
Average	.....	\$49.02	\$31.02	\$49.18

*Indicates deficit.

New Mobile Repair Shops

FOR THE ARMY

ORDNANCE maintenance mobile shop trucks are used for cleaning and repairing rifles, pistols, machine guns, artillery of all sizes except heavy railway mounts, tanks, combats and other track-laying vehicles as well as all automotive equipment furnished the army by the ordnance department. Number of vehicles required for the shop organization varies with type and quantity of materiel maintained. For instance, one or more small arms trucks especially equipped could easily handle maintenance of ordnance weapons and materiel furnished air corps squadrons. In other cases such as an ordnance company attached to a mechanized cavalry outfit, a very complete set of vehicles would be required ranging from spare parts trucks and cargo trucks to three or more shop trucks which probably would include a machine shop truck, a welding shop truck, an automotive shop truck and tank maintenance truck.

Shown in accompanying illustrations are units typical of those to be purchased by the army in large quantities. Fig. 1 below, for instance, shows typical lineup of vehicles ready for a day's march. All shop and special trucks basically are built on the same chassis making interchangeability of trucks a matter of switching bodies only. Shop truck bodies are the same and differ internally only in tools and accessories. Trucks having canvas covered tops are used for cargo, spare parts and artillery repair truck purposes. Types of bodies may be classified generally as either cargo or shop type. Cargo type use the canvas covered tops. Shop type tops are raised by a hydraulic hand pump—Fig. 2 showing one in process of being raised. This affords the necessary clearance in the truck body during repair yet low overall clearance when on the road. Bodies may be enclosed by curtains and heated to facilitate operations during severe weather. Curtains also may be unfastened and stretched out in tent fashion to provide a protected area around the truck. The cargo type bodies as shown in Fig. 6 are easily fitted with cases or chests to store and move a large quantity of materiel. Certain portable machines also are carried.

Shop trucks are designed with a view to maximum efficiency in type and arrangement of equipment. Electric power for shop trucks comes from a 5-kilowatt alternating-current gasoline-driven generator mounted on each shop vehicle except the welding truck which has only a 1-kilowatt generator. Any vehicle can produce current and transmit it to several vehicles by means of interchangeable plug and cable connections. Portable generators also are available.



Fig. 2. (Right) — Top on welding truck being raised by operating hand pump. Hydraulic system permits one side to rise before the other if it should bind. Note sides open up and down to form convenient platforms and roof extensions

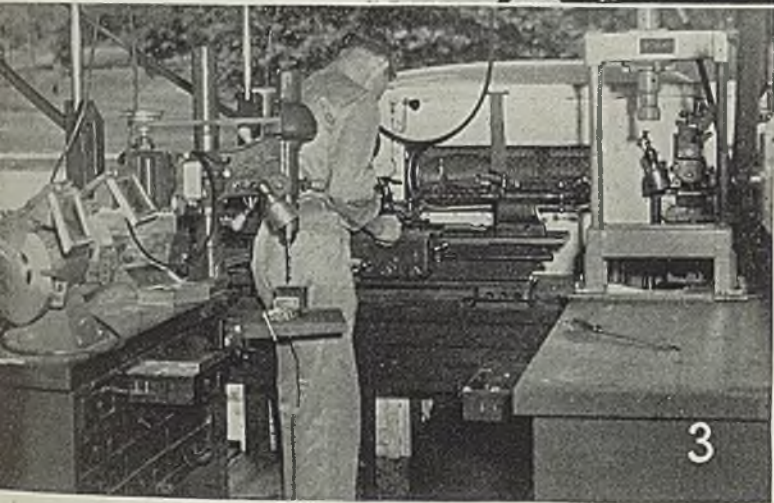
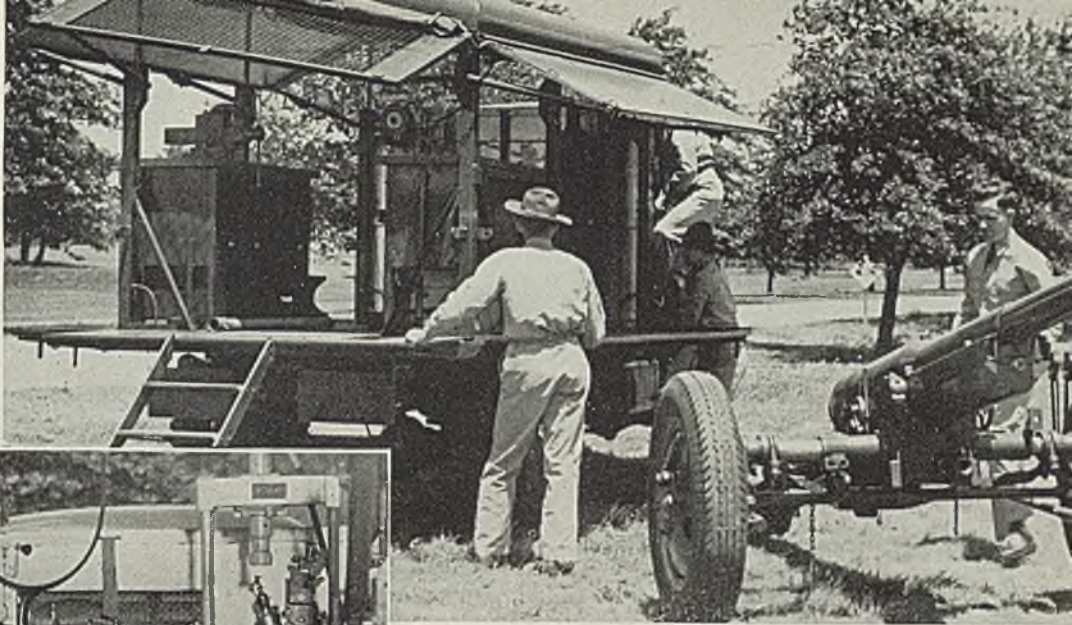


Fig. 3. (Above)—Interior of machine shop body. Note ample roof clearance, careful arrangement of equipment for ease and speed of operation. Also shown here is manner in which curtains are carried inside truck body

Fig. 4. (Below)—A 30-caliber fixed automatic aircraft weapon being repaired. Note this small arms repair truck has provision for grinder and drills as well as other small power tools

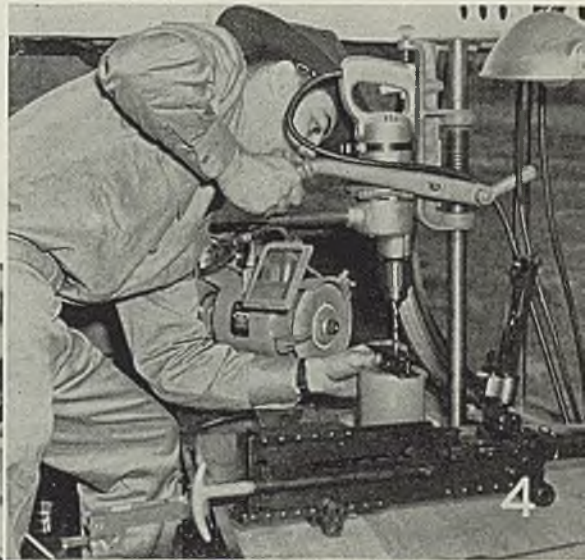


Fig. 6. (Below)—Here a cargo type body is being used as a spare parts truck. Chests are held in place by a readily removable rack device which permits two men to remove all the heavy chests. Portable electric hacksaw is provided for each maintenance company

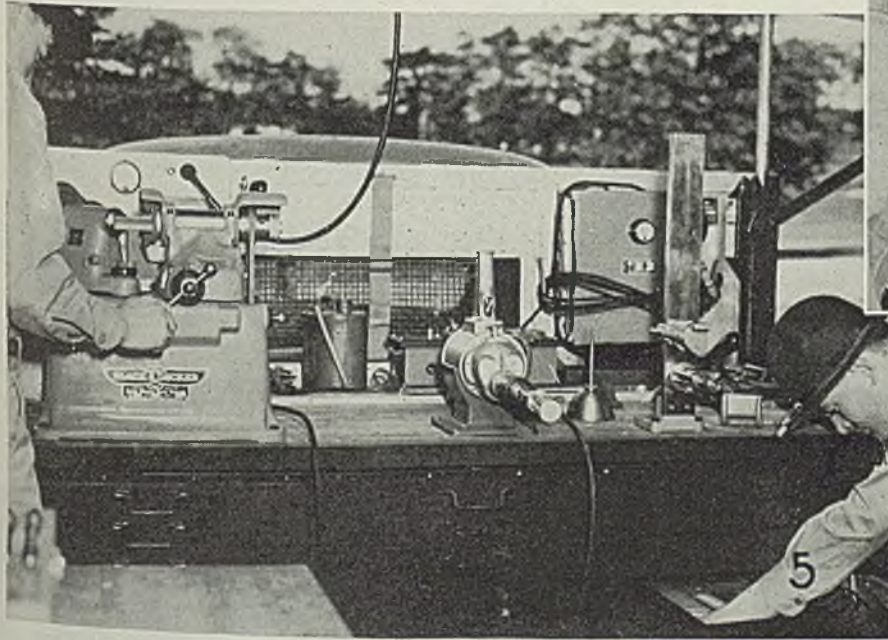
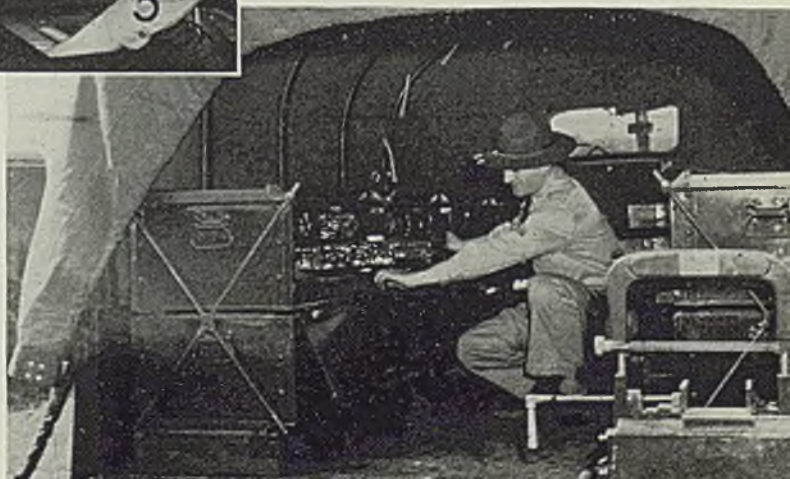


Fig. 5. (Above)—Automotive repair truck has complete complement of equipment to allow all major automotive maintenance operations to be handled quickly in the field. Drawers carrying large volume of small parts are locked shut by vertical bars

Fig. 1. (Left)—Lineup of shop and cargo vehicles for a day's march. Shop trucks have roofs lowered to obtain normal road height. Chassis are same, only bodies differ



Drying and Baking

with

Radiant

ENERGY

With 7 to 112 square inches of incandescent radiating surface per unit, gas radiants have tremendous infra-red energy output so dry and bake at exceptional speeds. Hot convection currents preclude cold drafts, flush out evaporated solvents, penetrate "shadows"

Part III

■ *Part I explained basic factors essential to most profitable use of either incandescent lamps or gas radiants as the energy source. Part II last week detailed application of incandescent-lamp radiant-energy ovens. Concluding this series, Part III this week covers use of gas radiants as the energy source.*

■ **GAS RADIANTS**, gas-fired infra-red-ray heating units, offer an extremely efficient source of radiant energy and are being increasingly applied to many types of industrial heating jobs, among them the drying and baking of metal coatings. In many instances, the heating characteristics as well as the low cost of operation of gas radiants have recommended them over other radiant-heat-producing devices.

Essentially, these units consist of concave surfaces of highest grade refractory, adjacent to which precisely controlled flames of premixed gas and air so burn as to develop refractory surface temperatures from 1500 to 3000 degrees Fahr. All the gas is completely combusted before leaving the concavity. The incandescent surface radiates infra-red energy in generous quantities and controlled directioning. Fig. 12 diagrammatically illustrates the two most used shapes of gas radiants—one presenting a near-spherical incandescent concavity to the work, and the other presenting a similar concave annulus or ring. In either case a uniform degree of incandescence

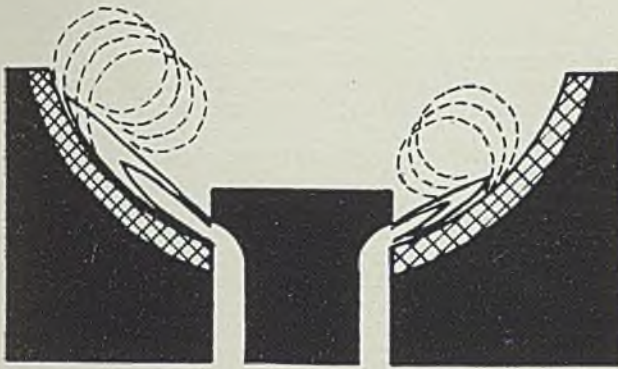
is secured over the greater part of the refractory concavity.

A most important attribute of gas infra-red radiants is the large surface which does the radiating. In the smallest and most used size, over 7 square inches of refractory surface is incandescent, and larger sizes offer radiating areas up to 16 times as large. Obviously this great incandescent mass and area permits an enormous output of radiant energy. The wave-length distribution of the infra-red heat developed by gas radiants is most propitious—a larger percentage of it being in the desirable infra-red heating zone and a smaller percentage in the visible spectrums. One manufacturer claims that 99 per cent of the total radiation from his gas radiant is "in the form of efficient infra-red." The net result is exceptional speed of baking or curing finishes.

According to exhaustive research work currently being conducted by the Industrial Gas Research committee of the American Gas association, the radiant energy alone from small gas radiant burners has in numerous tests cured finishes in one-half to one-third of the time required by other radiant energy sources

A correlated abstract prepared largely from material in papers by Howard Haynes, Nela Park Engineering department, General Electric Co., Cleveland; H. J. Bennett, Glidden Co., Cleveland; D. J. Stedefeld, chief chemist, Clinton Co., Chicago; D. A. Jacobson, field engineer, Burdett Mfg. Co., Chicago; Hale A. Clark, Michigan Consolidated Gas Co., Detroit; F. O. Hess, president, Selas Co., Philadelphia; Infra-Red-Ray Heating Clinic of American Gas Association's industrial gas conference at Toledo, O.

STEEL



BURDETT TYPE

SELAS TYPE

—all test conditions, finishes, metal samples, unit spacings and such being identical. The gas fuel costs under these conditions were found to be one-half to one-fifth those of the other radiant-energy sources. When these preliminary tests are extended, substantiated and reported upon (probably next Spring), more specific design information in this connection can be offered.

Another virtue of the gas-refractory type of radiant is that the surface temperature of the radiating concavity is built up as furnace temperature increases. Specifically, a gas radiant which, at a given burner pressure and input, will present 9 square inches of radiating surface at 2000 degrees Fahr. when operating in open air, will have an incandescent refractory temperature of 2400 degrees Fahr. when the oven temperature has reached 1800 degrees Fahr. In addition, gas radiants provide a wide latitude of heat-input adjustment by simply varying the burner pressure.

Also not to be neglected in considering gas radiants are the extra beneficial effects of the hot convection currents in the working space necessarily

Fig. 13—A simple method of installing gas radiants with 9-inch spacing, center to center. The metal sheet is stainless for simple construction and high reflectivity. Another sheet 1 inch behind this provides the dead air space necessary for efficient insulation characteristics. Sheet shows black here because photographic exposure was made to get detail of radiants, overexposing the sheet

Fig. 14. (Right)—A corner of a test oven used in current American Gas association researches to evaluate radiant drying versus convection drying and to compare radiant energy sources. Here radiants are arranged in a square rather than a hexagonal pattern. Test piece, sprayed with test finish, may or may not be rotated

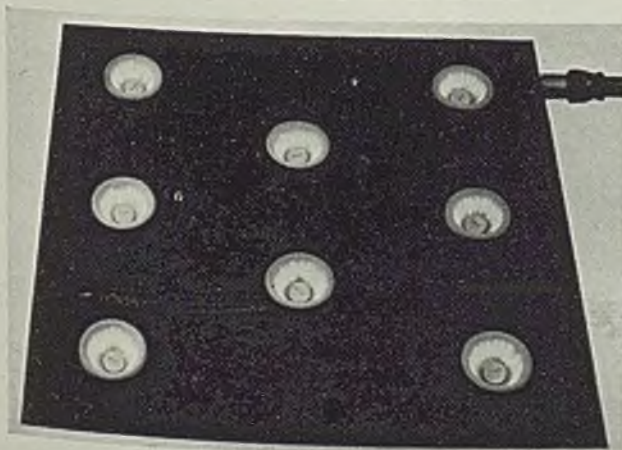
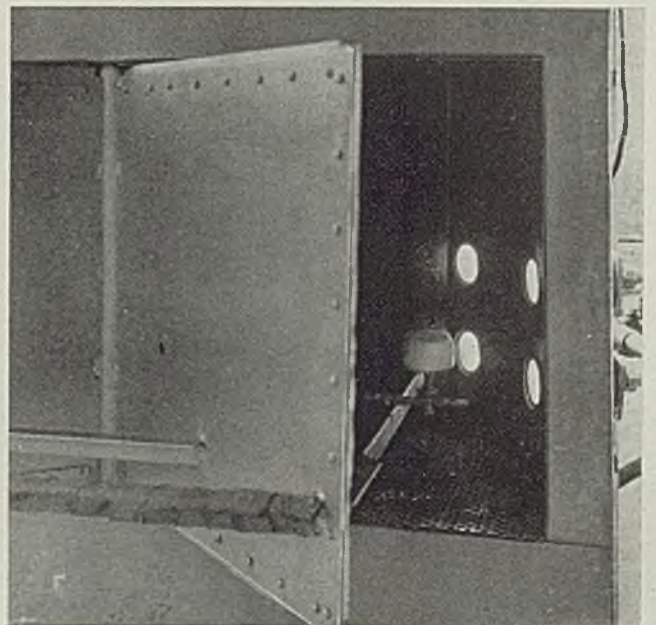


Fig. 12—These are typical types of gas radiants as seen in cross section. Cross-hatched areas represent the radiant "skin" of the refractory bowl or annular ring which attains temperatures up to 3000 degrees Fahr. Position of flames and convulsion of products of combustion back toward radiant surface are shown

set up by the movement of the hot products of combustion. These hot convection currents represent but a fraction of the total heat output, and can easily be kept away from the work if desired—although their plus values can and should be put to good use in any heating operation.

In finish baking, the hot flue gases obtained in addition to the radiant heat output are especially valuable in: (1) Flushing the evaporated solvents from the baking space, (2) ensuring heat penetration even into the "shadows" which have always caused so much trouble in infra-red-ray baking, and (3) precluding cold drafts into the oven by the simple expedient of maintaining a beneficial flow of hot gases in the opposite direction. In most infra-red-ray heating to date, designers have had to go to considerable trouble to scotch cold drafts around the work. Additional virtues of the limited hot convection currents associated with gas-fired infra-red-ray heating and worthwhile in any heat application are: (4) An extra mite of efficiency in utilizing the total heat content of the fuel, and (5) the availability of these hot convection currents for preheating functions if properly directed by small fans within the heating



chamber or by the furnace construction itself so that they flow into suitable work-preheating chambers.

To demonstrate the worth of the hot convection gases associated with gas infra-red-ray heating, American Gas association researchers have conducted tests wherein Pyrex glass baffles cut off the hot gas and permitted only the infra-red radiation to strike the work. Also, they have compared the curing times of test pieces receiving both the radiant and the convected heat, and pieces so shielded as to profit only from the hot convected currents. It has been definitely indicated that curing times are appreciably shortened by the existence of the hot convected gases in addition to the radiant heat output.

In designing for gas radiants, even as in all infra-red-ray heating, it is advised that users work in close co-operation with the manufacturers of the radiants themselves. It is absolutely impossible to design infra-red-ray finish baking equipment, however fueled, on paper without preliminary tests conducted on the parts and with the finishes to be used, and drawing upon the experience of similar successful installations. In general, gas radiants should not be located closer than 6 inches from the work and may be moved back almost any distance. Greatest effectiveness is obtained if elements are not more than 2 or 3 feet away from the work.

Any lateral spacing of gas radiants (center to center) can be

arranged for, down to a compact hexagonal nest of 3-inch-diameter units in a solid bank. If relatively small heat inputs over large areas are required, wide burner spacings (up to 2 or 3 feet center to center) are quite feasible.

In such cases, the construction of the heating chamber walls is important. Any closed-wall construction can, of course, be used, although, if the burners are not being adapted to existing equipment, simple stainless steel walls (preferably double to provide dead air insulation between) are the cheapest and most effective. The polished surface helps to refract the infra-red radiation back on the work, and the dead air space provides adequate insulation and baffling. In infra-red-ray baking, refractory walls are expensive and make the furnace slow in establishing new temperature conditions if temperature adjustment is a factor.

Gas radiants may be placed in any position—their distribution and positioning in the chamber walls and about the work being dependent upon the shape, mass and conveyed speed of the work itself. At the very outside, a single minute is adequate for heating up both radiants and ovens to operating conditions. Lighting tubes or automatic pilots can make the ignition of the gas units absurdly simple.

Radiants for finish baking have already been applied successfully by many producers. Shown in Fig. 15 is a representative job using the

Burdett annular type of radiant to bake 4375 pounds per hour of cycle frames, wheels, fenders, chair seats, wagon bodies, and the like for the American National Co., Toledo, O., manufacturer of children's vehicles and tubular lawn furniture. The parts traverse the heat zone in 19 minutes to dry and bake and slightly more than 11 gallons of synthetic finishes in a wide variety of colors (and containing approximately 20 per cent thinner) are used. Previous method of baking with indirect steam heat required 1 hour and 15 minutes.

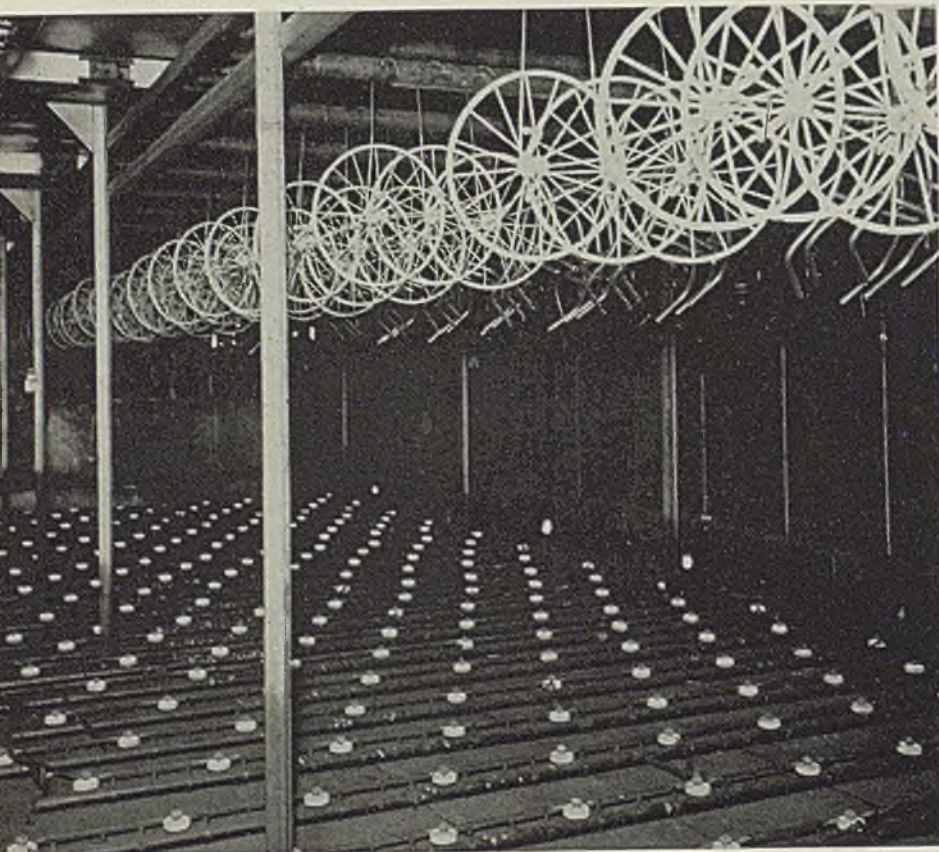
Adaptable to Many Uses

In order to keep the air both in the radiant oven and in the shop sufficiently "sweet," it is necessary to exhaust 4500 cubic feet per minute of air from the radiant oven. Hence, it is obvious that a certain amount of convected air heating is done and that the installation would not be successful without it. Even so, the gas consumption does not exceed 1950 cubic feet per hour of natural gas. Thus, in this instance, only 2½ cubic feet of gas are burned for each pound of work handled. Tests have shown that this consumption could easily be cut in half if less ventilation were permissible or lighter work with less metal bulk were being finished.

Jobs utilizing the Selas type of gas radiant with 6-inch spacing (center to center) are used in New England for baking finishes on the brass parts of cosmetic containers and for the finishing of stamped steel clock cases. Five installations exist for baking paint on the interior of glassware by directing the infra-red heat from gas radiants through the glass body of the part itself. Another installation involves an ingenious new method of baking "dragon's blood" and engraver's lacquer on engraving plates in a New York engraving establishment.

Dozens of applications for gas radiants, over and above finish baking, have been made—for continuous strip annealing, stress relieving in steel bottles, pack carburizing, wire drawing, high-speed drying of printing ink, varnish cooking, ceramic glazing, etc. The experience obtained in these fields should be of immeasurable help in adapting gas radiants to the new job of baking and drying organic finishes by means of infra-red radiation.

Fig. 15—Several hundred gas radiants disposed on the floor of this oven bake synthetic enamel finishes by a combination of radiant and convected air heating. Such combinations appear to be most effective solution to many drying and baking problems today. Oven here is only partially loaded for photographic purposes



Cans

TO HOLD THE BOUNTY OF A NATION

A few years ago only the few could afford vegetables out of season. Today vegetables in sanitary tin cans bring their healthful vitamins the year 'round to every family in the land, at trifling cost.

Every year America uses *ten billion* tin cans, which make it possible to save and distribute 300 million dollars worth of food and other perishables for the benefit of the public.

America is more healthful with these vegetables added to its winter diet, farmers have millions in extra income, food prices are lower -- all because of cans.

And this is only *one* use of steel. Our transportation, homes, clothing, amusements, national defense -- everything depends on steel for its material or on steel machinery for its construction. And steel, in turn, depends on *men* to make it right. Here at Youngstown we are constantly making improvements to keep our mills as modern as science can develop. But all the equipment in the world can't equal *men* in the making of fine steels. We are proud of our workmen who are spending their lives making the finest TIN PLATE that skill and care can produce.

Tin Plate - Sheets - Plates - Pipe and Tubular
Products - Conduit - Bars - Rods - Wire - Nails -
Tie Plates and Spikes

25-22C



THE
YOUNGSTOWN
SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

Strengthening Anneal Developed For Nickel-Chromium Irons

■ WHILE it is known that the 4½ per cent nickel and 1½ per cent chromium white cast irons provide improved hardness and abrasion resistance over conventional unalloyed white cast iron, it is not so well recognized that this alloy iron also offers added toughness which can be further increased by the low-temperature annealing regularly employed for the relief of casting stresses, according to the International Nickel Co. Inc., 67 Wall street, New York.

Table I shows results typical of the superior properties which can be developed in this type of alloyed white iron by suitable heat treatment. The unalloyed white iron does not respond readily to heat treatment. However, a low-temperature anneal increases both transverse strength and deflection,

recommended that the alloyed castings be treated as follows for maximum strength and resistance to shock:

First, heat slowly to between 400 and 600 degrees Fahr., holding for 1 hour per inch of section thickness plus 3 to 6 hours and cool to 200 degrees Fahr. at a slow rate. A period of 16 to 20 hours is desirable. As a better alternative, large sand castings cooled to between 1400 and 1200 degrees Fahr. from the casting temperature may be placed in a furnace preheated to the 600 to 700-degree range and permitted to cool at a controlled rate of 30 to 60 degrees Fahr. per hour to 700 degrees Fahr. The rate of cooling from 700 to 200 degrees Fahr. should not be faster than 25 degrees per hour. Thus such castings should cool down gradually for 20 hours or longer.

TABLE I—How Anneal Strengthens Nickel-Chromium White Cast Irons

Type	Load pounds	Transverse* Deflection inches	Brinell hardness No.
Plain Iron			
Sand cast	3105	0.069	418
†Annealed	2545	0.068	430
Nickel-chromium			
Sand cast	2890	0.085	627
†Annealed	4570	0.113	632
Plain Iron			
Chill cast	4370	0.076	532
††Annealed	4140	0.080	488
Nickel-chromium			
Chill cast	4220	0.106	707
††Annealed	5530	0.116	713

*1.2-inch arbitration bars, 12-inch span.
†Annealed for 24 hours at 375 degrees Fahr.
††Annealed for 3 hours at 400 degrees Fahr.

and consequently toughness, without altering hardness appreciably in the alloyed iron. The superiority of the stress-relieved alloy iron is quite striking, especially when the high hardness values also are taken into account. In addition, chill cast white alloyed iron is superior in strength properties to the sand cast variety, a fact contrary to popular conception.

It is customary to submit the alloyed white cast iron to the low-temperature anneal in the range of 400 to 600 degrees Fahr. to relieve the casting stresses which normally exist in the material when cooled to room temperature. It is particularly desirable in castings of complicated design and varying cross section. Certain test specimens have shown a 50 per cent increase in tensile strength when annealed for 3 hours at 400 degrees Fahr. as compared with unannealed sand cast bars of the same composition. As result of these and other laboratory tests and field experiences, it is rec-

Second, the chilled castings, particularly large ones, should be stripped of their chills after solidifying throughout and permitted to cool in sand, in an insulated pit or a preheated furnace as mentioned above. If the cooling rate from 700 to 200 degrees Fahr. exceeds 30 degrees per hour, they should be reheated to within 400 to 600 degrees Fahr. and slow cooled as previously described.

Properly following these directions for the anneal will largely eliminate cracking of castings in the mold and will avoid spalling, chipping and cracking in service, consequently insuring that the benefit of the high abrasion resistance of the alloy is fully realized by increased life in actual installation.

Introduces New Series Of Rust Preventives

■ A new series of rust preventives including liquid rust-inhibiting non-

drying products built from a newly developed base, is announced by E. F. Houghton & Co., Third and Somerset street, Philadelphia. It includes grease-type (non-drying) products, drying, hard-film products, semidrying (waxy film) and soluble rust preventives.

The new basic material provides a homogeneous film with a high degree of cohesion as well as adhesion to metals. It wets out the surface rapidly making a nontacky unbroken film impervious to atmospheric conditions.

Products are provided to meet government and industrial specifications. Also developed is a new method of accelerated testing of rust prevention to aid industry in selecting the most adequate anticorrosive covering.

Link-Belt Reclassifies Line of Bearings

■ Realizing difficulties encountered in trying to distinguish between the series numbers assigned to the various types of antifriction bearing units, Link-Belt Co., 519 North Holmes avenue, Indianapolis, is "humanizing" the presentation of its five types by comparing them with prize fighters, and reclassifying the group according to the various weights of fighters known to the ring.

The five different types include Series 100 ball bearings and Series 400, 500, 600, and 7200 self-aligning roller bearings. The new classifications decided upon are: Flyweight for the Series 100; Welterweight, Series 400; Middleweight, Series 500; Heavyweight, Series 600 and Alternate Heavyweight, Series 7200.

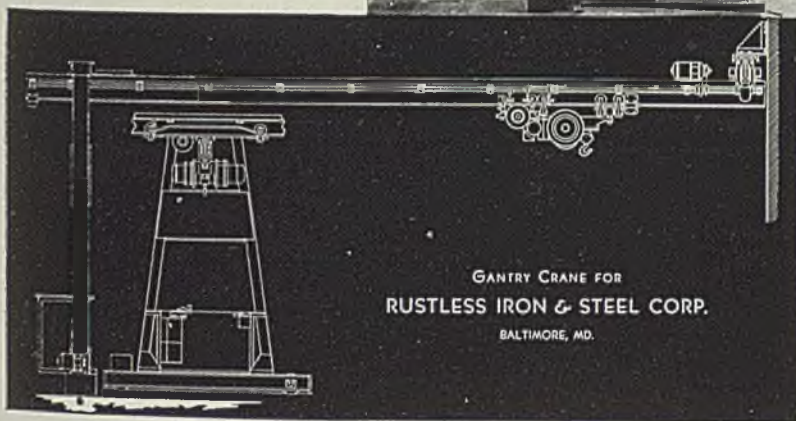
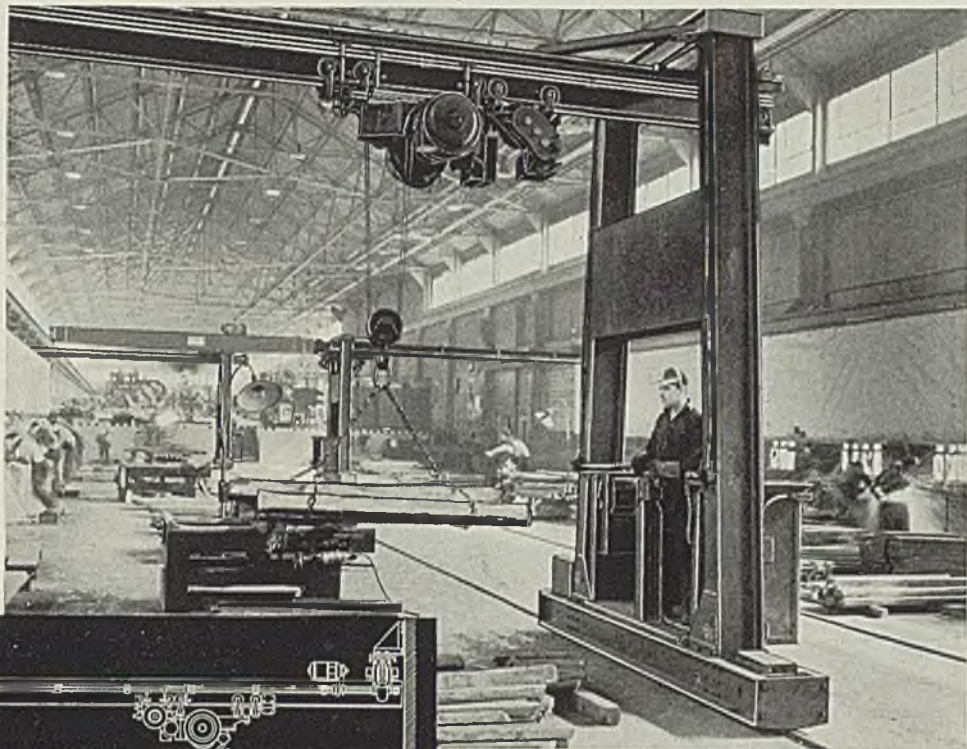
The line as a whole will be known as Friction Fighter bearings, since the term describes a characteristic of the antifriction bearing.

Offers "Talk" on Eye Accidents

■ To help decrease industrial eye accidents, American Optical Co., Southbridge, Mass., has prepared an interesting illustrated talk on the cost and causes of accidents with suggestions to eliminate the causes and lower the costs.

The talk is supported by charts, and has been prepared for delivery before safety engineers, management executives and people or organizations interested in the safety movement. Copies can be borrowed from the company which also will be glad to supply a speaker if one is desired. Easily delivered in 30 minutes or less, the talk is free of advertising. The theme of the message is "Eyes Are Expensive Targets," and the point is amply proved by factual matter and statistics.

We are proud
of this job at
RUSTLESS



2-ton Gantry Cranes operate at 100 f.p.m. by MonoTractor drive. 30 ft. bridges are equipped with electric hoists propelled at 350 f. p. m. by spur geared Mono-Tractors. Full control from cab.

For the job of handling 2-ton loads of billet to and from grinders in their new mill, Rustless Iron & Steel Corp. chose American MonoRail Gantry Cranes.

These free-moving cranes operate beneath the heavy box crane to allow quick transfer of light billets between operations at a lower handling cost than would be possible otherwise.

Their sturdy construction marks the type of special design created by American MonoRail engineers to meet unusual condition. With the use of standard units such as the American MonoTractors, such equipment can be fabricated at no excessive initial investment.

It is the extreme flexibility of such standard parts that makes it possible for American MonoRail engineers to meet special requirements without extra cost. Their service is available for consultation in any handling problem at no obligation.

A 250 page book used as a technical reference for all data covering Mono-Rail Equipment will be sent on letterhead request.



**THE AMERICAN
MONORAIL COMPANY**

13102 Athens Ave. Cleveland, Ohio

NEW STAINLESS PLANT

Works of Rustless Iron & Steel Corp. at Baltimore are devoted exclusively to the production of stainless steel ingots, billets, bars and wire from virgin chrome ore to the finished product

■ RUSTLESS IRON AND STEEL CORP., Baltimore, held "open-house" on Nov. 8 to celebrate completion of an expansion and improvement program inaugurated in 1935. The inspection party consisted of some 800 invited guests that included steel company executives, stainless steel fabricators, jobbers, distributors,

financiers, editors and others interested in the industry.

At a dinner in the evening, C. E. Tuttle, chairman of the board of directors and president, hailed the completion of this program as a refutation of the defeatist philosophy that no frontiers remain in America.

"Rather," he declared, "we believe that we see a true expression of the limitless opportunity that is before us, of the spirit of free enterprise that in the last 100 years has produced the highest standard of living established anywhere in the world."

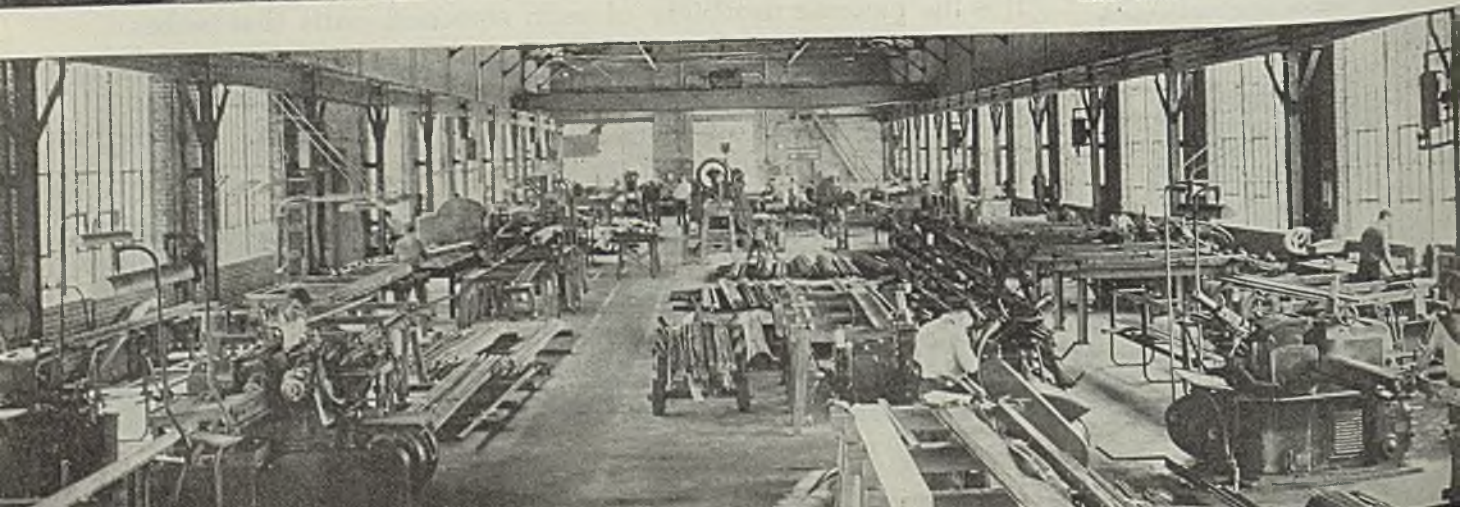
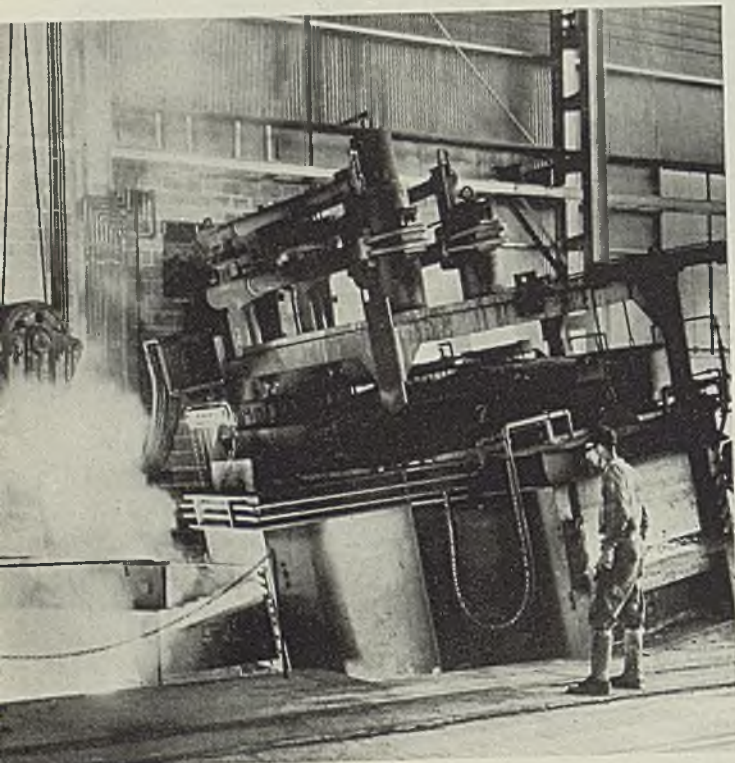
The concluding portion of the expansion program that was unveiled on Nov. 8 represents an expenditure of about \$2,500,000. It involves the following new equipment, all for producing in various forms the company's only product—stainless steel:

- Two 16-ton electric melting furnaces.
- One 28-inch billet, sheet-bar and slab mill.
- One 3-stand, 12-inch mill for bars and rods.
- One 7-stand, 9-inch mill for bars and rods.
- One cold mill for special bar and wire shapes.

The new building is 1800 feet long and the production arrangement is of the straightline type. Ingots go into the new mill from the storage yard at one end and completely finished stainless steel bars and

Tapping one of the new 16-ton electric furnaces in the new melt shop. The five electric furnaces operated by the company have an aggregate melting capacity of 75,000 tons per year

ingot storage yard which is spanned by a 10-ton crane. All ingots are numbered by identification as to analysis and heat



wire are loaded at the other end on trucks and railroad cars for delivery. The new addition expands Rustless' capacity 40,000 to 75,000 tons per year. Another notable feature is that the expansion program has increased the number of employes on the Rustless payroll from 450 two years ago to 1400 at present.

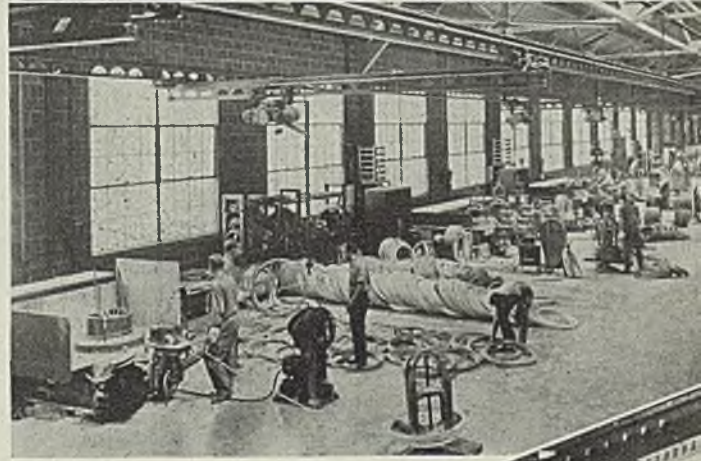
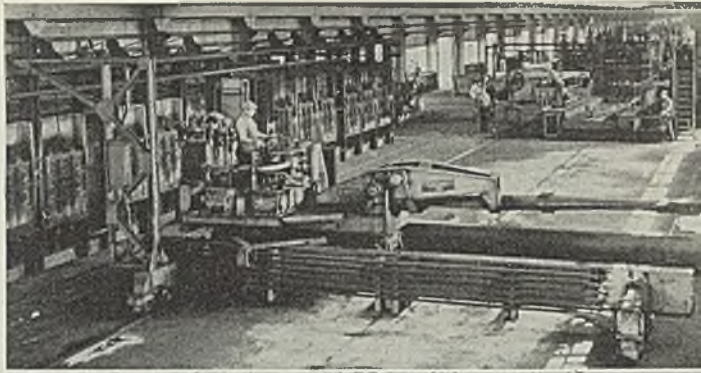
In studying the stainless steel industry in the light of its expansion program, the company has developed some interesting statistics based on data published by the American Iron and Steel institute. These show that the production of stainless steel has been growing at a much faster rate than the production of steel as a whole. With 1934 ingot production as 100 per cent, the comparative growth in production of stainless steel and all steel is as follows:

Year	Stainless steel, %	All steel, %
1934	100	100
1935	132	131
1936	182	183
1937	280	194
1938	172	109
1939	321	181

Rustless also calculates that whereas ingot production for the stainless steel industry as a whole, considering 1934 as 100 per cent, had grown to 321 per cent by the end of 1939, its own production had increased to 790 per cent. Its own increase up to June 30, 1940, is figured at 998 per cent.

Unique feature of the Rustless method of stainless steel manufacture is that it can utilize chromium from any one or combination of three sources, natural chrome ore, ferro-chromium or stainless steel scrap. Its processes are covered by patents or applications for patents which have resulted from research by the company's own chemical and metallurgical engineers.

The company's products are sold in the form of billets, bars and wire to industrial users, and in the form of ingots, blooms, slabs, billets, sheet bars to converting mills for processing into sheets, strip and plates.

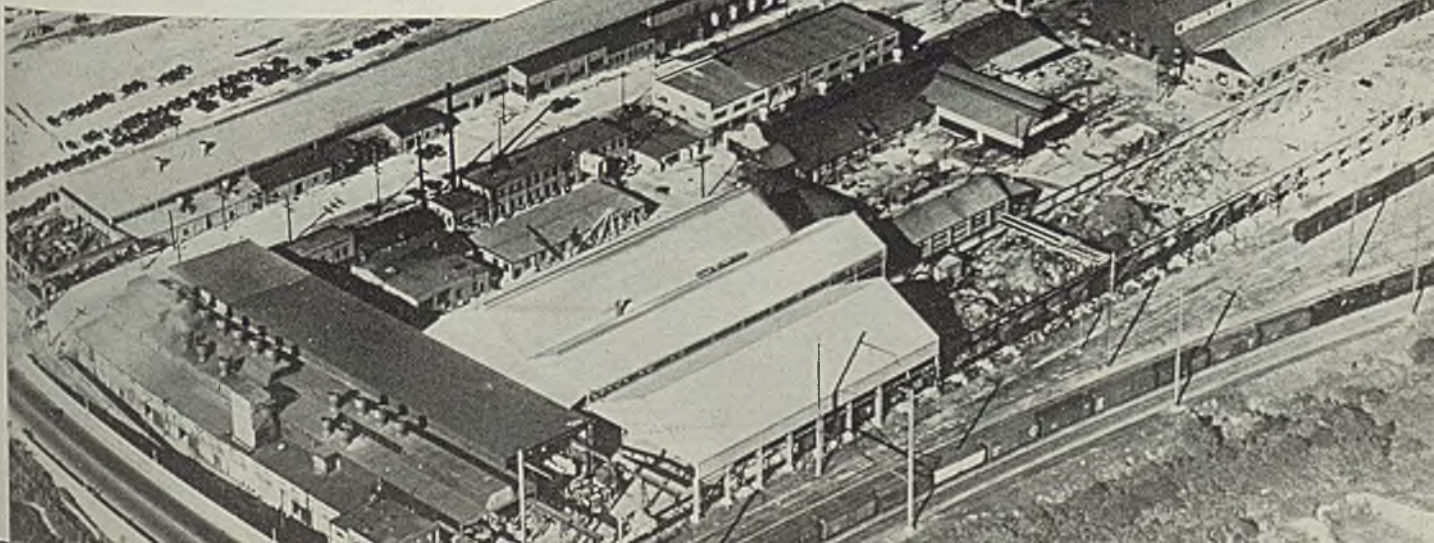


Specially-designed charging machine which transfers ingots from the heating furnaces to the approach table of the 28-inch mill. All heating furnaces are equipped with modern temperature controls

Hot rolled annealed bars are cold drawn in this finishing department to the required specification. High surface finish is imparted by grinders and polishers

Interior of wire drawing department. Various draw benches are served by monorail hoists

Airplane view of Rustless Iron & Steel Corp.'s plant at Baltimore, devoted entirely to the production of stainless steel. The new 1800-foot straight-line production unit is shown at the extreme left

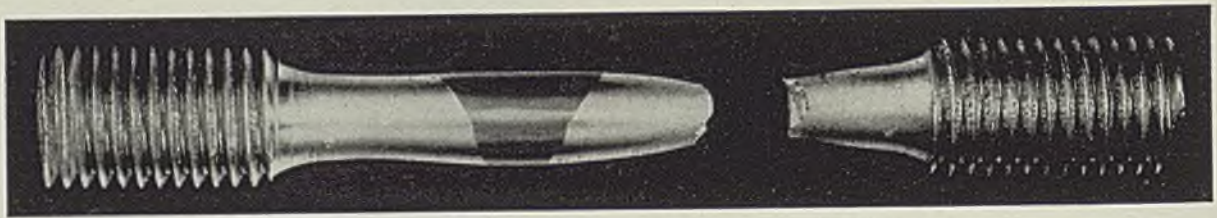




By **W. B. SCOTT**
Metallurgist
Ampco Metal Inc.
Milwaukee

Aluminum-Bronze Welds

Development of series of coated aluminum-bronze welding rods permits making bronze welds that exhibit higher strengths than mild steel. Hardness values obtainable up to 387 brinell



■ THE WORKING of bronze is an ancient art and welding is, perhaps, the most modern of metallurgical techniques. The use of welding to coat base metals to form the so-called alloy-clad pieces has permitted tremendous savings as well as new fields of application for both ferrous and nonferrous materials.

Aluminum bronze, one of the present day ramifications of this ancient alloy series, has, however, proved to be one of the last fields of the welder's conquest. The entire story of bronze has been a slow and sporadic attainment of strength and hardness in the copper-base alloys. Tin, zinc, lead, manganese, aluminum and other additions have been made until now these copper alloys rival the steels in physical properties. Because of the readily appreciated but seldom understood characteristics that may be classified loosely as bearing properties, the bronzes have been used for

Exceptionally high strength of the aluminum-bronze weld is demonstrated here. This specimen broke at 84,000 pounds per square inch after 27 per cent elongation in 2 inches with the V-notch Grade-18 Ampco-Weld still retaining its original diameter. Steel is SAE 1020, standard 0.505-inch diameter tensile test bar

parts mated with steel wherever problems of wear were involved. The high-aluminum bronzes containing iron up to 3 or 4 per cent have been outstanding in this regard in all industrial work. These alloys are also highly resistant to corrosion, shock and fatigue.

The properties of the aluminum bronzes as represented by Ampco Metals include six grades with tensile strengths ranging from 60,000 to 85,000 pounds per square inch, yield strengths from 22,000 to 45,000 pounds per square inch, per cent elongation in 2 inches from 0 to 27

per cent, hardness from 109 to 352 brinell.

The wear resistance of these alloys is difficult to tabulate, largely because each alloy is more or less tailor made for certain applications. Wherever the cost and maintenance have dictated the economy, these aluminum bronzes have been used. It is only now that the design engineer and maintenance man have had the means of putting this wear-resistance right at the point where wear-resistance is required, and at the same time been allowed to keep well within the most stringent cost limitations.

Brazing and the use of bronze welded material have been known for some time but the hardness and strength of joints made with available material had a definite ceiling, too low for many requirements. The relationship between inventor and necessity has always been regarded as a natural one. Thus the development of an aluminum bronze welding rod was largely a matter of diligence and ingenuity on the part of the workers in this field. The advantages of aluminum bronze had long been realized and the demand for a satisfactory weld material was fully developed.

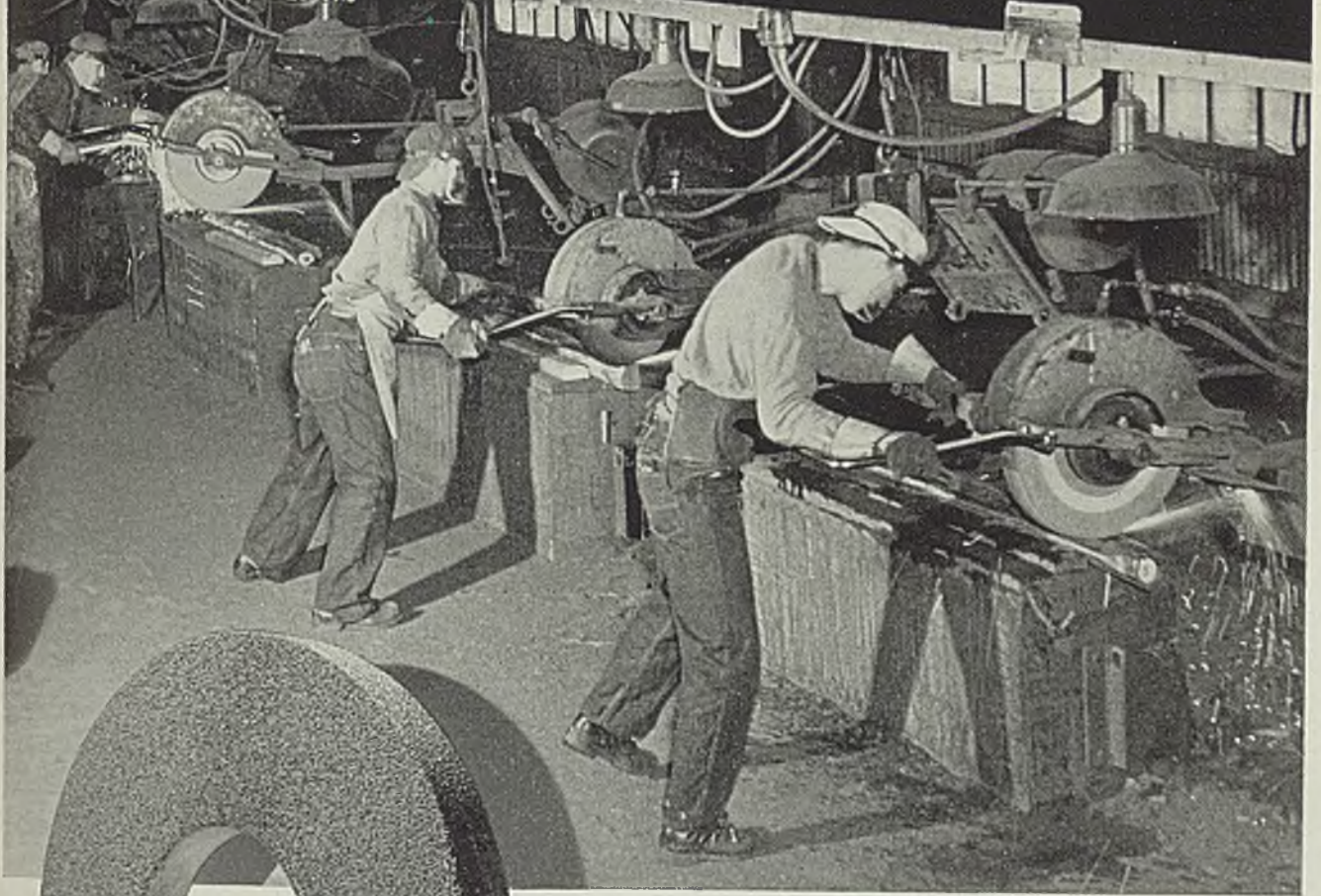
The new aluminum-bronze welding rod introduced by Ampco Metal Inc., Milwaukee, producers of high-grade industrial bronzes, is new from the standpoint of the flux coating, the first and only aluminum-bronze welding rod so treated, it is claimed. Also exceptional physical properties are obtained

TABLE I—Physical Properties of Weld Metals

Weld Material	Rockwell (B Scale)	Ult. Str. P.S.I.	Elongation % in 2"
Copper-Tin-Lead (80-10-10)	83	39,600	9.5
Copper-Tin-Zinc (88-10-2)	90	44,300	10.0
Phosphor Bronze	90	51,700	18.0
Commercial Bronze (90 Cu, 10 Zn)		36,500	31.0
Manganese Bronze	60	55,000	14-18
*Grade 12 "Ampco-Weld"	63	61,500	24.5
*Grade 16 "Ampco-Weld"	79	87,000	16.0
*Grade 18 "Ampco-Weld"	89	92,500	12.5
*Grade 20 "Ampco-Weld"	94	76,500	8.5
*Grade 21 "Ampco-Weld"	29**	79,500	4.5
*Grade 22 "Ampco-Weld"	38**	96,000	0.5

*Actual test bar of all weld metal. **On C scale.

BILLET GRINDING AT RUSTLESS



... Done at Minimum Cost
with **ALUNDUM WHEELS**

MODERN—that's the keynote of the new mill of Rustless Iron & Steel Corporation at Baltimore. And the cleaning room is no exception—it is up-to-date in every detail of layout and equipment. It is efficient for it includes Norton Grinding Wheels for removing scale and seams from the stainless steel billets.

From the Norton research laboratories have come newly developed formulae for resinoid and rubber bonds. Combined with the features of hard, tough Alundum abrasive they have resulted in grinding wheels that can cut billet cleaning costs for you as they have for Rustless.

Call in a Norton Service engineer.

NORTON COMPANY, WORCESTER, MASS.

New York Chicago Detroit Philadelphia
Pittsburgh Hartford Cleveland Hamilton, Ont.

NORTON ABRASIVES

TABLE II—Currents for Metallic Arc Welding

Work Thicknesses	3/8"	1/2"	3/4"	1"	1 1/2"	2"
Aluminum Bronze (Ampco)	175	190	210	230	250	275
Ordinary Bronze	185	190	200	210	220	250
Manganese Bronze*	200	215	230	250	275	310
Cast Iron	120	135	150	160	175	180
Steel	175	190	210	230	250	275

*Special Coating.

TABLE III—Currents for Carbon Arc Welding

Work Thickness Inch	Filler Rod Diameter Inch	Carbon Diameter Inch	Recommended Amperage
1/4	3/16	1/8	135
1/4	1/8	3/16	175
3/8	1/8	1/8	185
1/2	1/4	1/2	250

in the weld metal itself.

The tensile piece shown in Fig. 1 is a standard 0.505-inch test bar turned from SAE 1020 steel, with a V-notch weld of Grade 18 Ampco-Weld. This bar broke in the steel after 27 per cent elongation in a 2-inch, gage length, at 84,000 pounds per square inch. Note that the steel elongated at both sides of the weld section finally to break with the typical cup fracture. The aluminum-bronze weld material, however, is still near its original diameter with little apparent elongation. Table I shows the physical properties of weld metal made from the various grades of Ampco metal.

The strength of the weld-metal is, of course, of great importance, but inasmuch as the strength of these Ampco-Weld alloys is greater than that of many of the metals with which it is used, the hardness is the real point of interest. This hardness and resistance to deformation are the chief factors in determining the need for using the new welding rod. An examination of the structure of the metals is quite helpful in appreciating these physical characteristics.

Micrographs shown here illustrate the structures of the various members of the Ampco-Weld series. Grades 12 and 16 are essentially

crystals of alpha bronze in a matrix of beta. Grades 18 and 20 are close to the uniform eutectic structure, characteristic of the high-copper alloys. Grades 21 and 22 are extremely hard alloys and show the so-called Ampco phase which is held responsible for the great resistance to wear of these metals.

The following is a thumb-nail sketch of the different grades, with respect to their properties and application.

Grade 12 is relatively soft and tough; has a somewhat lower melting point than the other Ampco alloys and flows freely, thus permitting its use at a lower work temperature. In repair work, it is recommended that the oxyacetylene flame be employed although its use is not limited to the gas process. This grade is suitable for welding cast iron and steel parts, and repairing gears not subject to extreme wear or heavy stresses.

Grade 16 comes closest to meeting the requirements of an all-purpose rod. It may be used for joining both ferrous and nonferrous alloys with either the oxyacetylene flame or electric arc. It has superior bearing characteristics combined with unusual resistance to wear and squashing out. The machinability of Grades 16 and 18

compares favorably with that of other nonferrous alloys.

Grade 18 possibly is easiest to apply and possesses the best all-around combination of physical properties. The type of welding used does not affect its physical strength or hardness values.

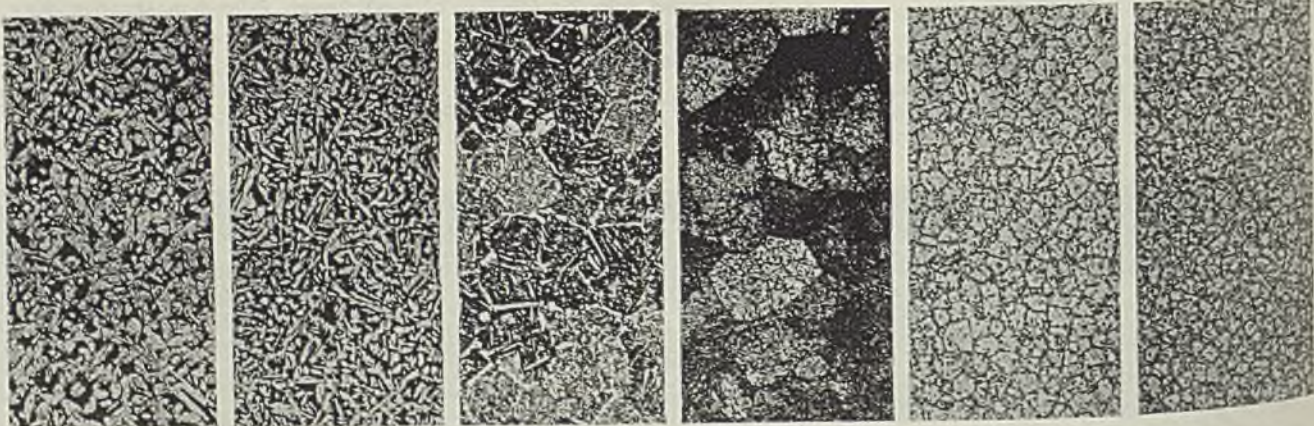
Grade 20 is the first of the harder grades, consequently it has lower elongation. Easily applied, it can be used for repair work, or for overlays where the size of the casting and the application are such as to prevent the economical use of cast aluminum-bronze.

Grade 21 has an exceptionally high hardness ranging from 275 to 310 brinell when applied with the oxyacetylene torch, and from 300 to 335 when applied with a metallic arc. Because of the physical properties, it is suitable for forming and drawing dies on carbon and stainless steel, where freedom from scratching and galling is desired.

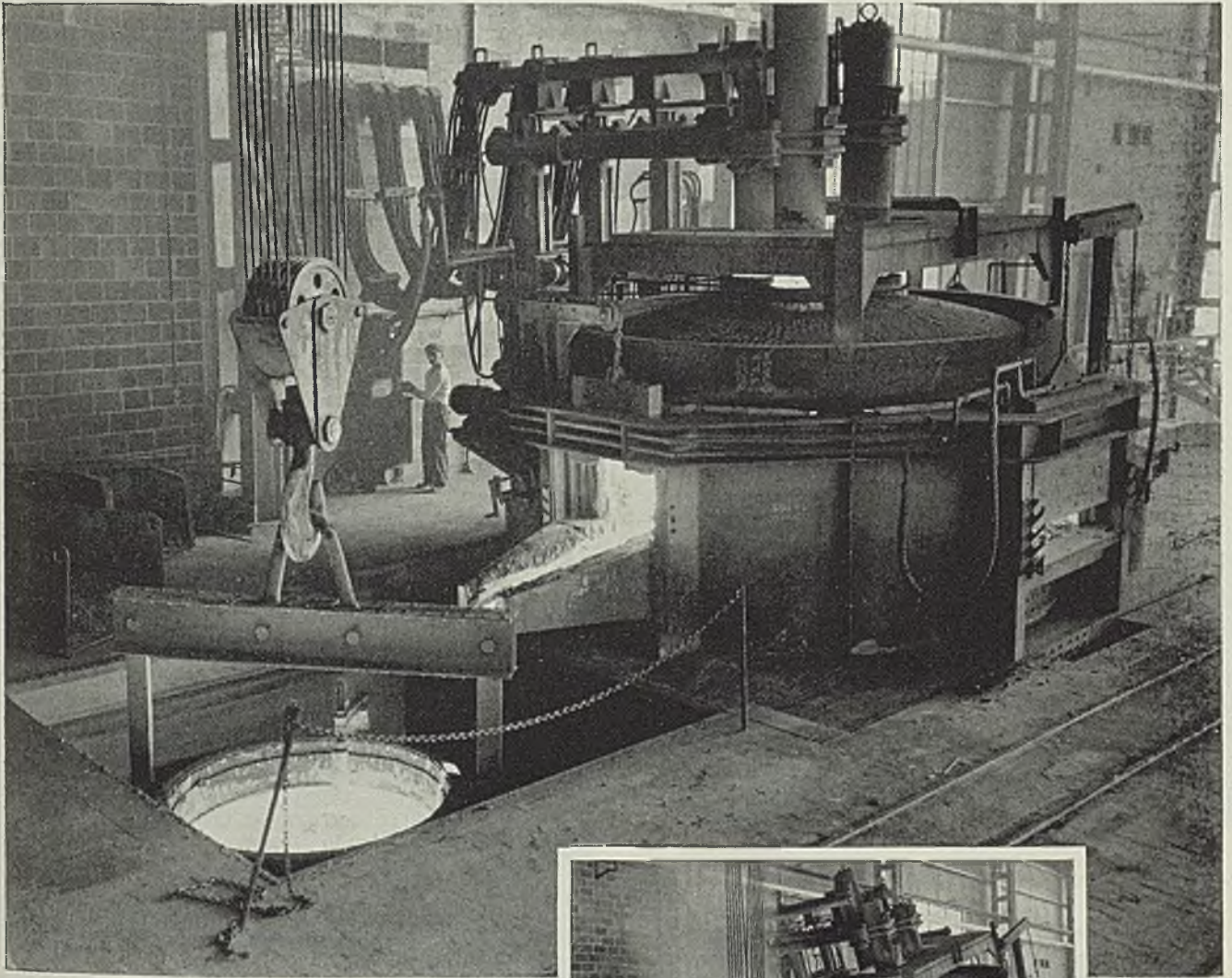
Grade 22 is extremely hard, being the hardest grade regularly produced and testing up to 367 brinell. Its field of service is limited to overlay application where its low elongation will not cause difficulties. Its customary application is on long-run forming dies and where deep draws on heavy gage stock are involved. Because of its extreme hardness, grinding is recommended where a finished surface is required. Application with a metallic arc is preferred, and slightly higher generator currents are called for.

Recommendations for Use: The oxyacetylene welding practice is still finding extensive use and these rods are readily applied by this method. Since these alloys melt at lower temperatures than most ferrous alloys, it is not necessary to preheat the entire casting. Welding requires only local preheating to a high cherry red, making it possible to repair large structures without dismantling. Welds are generally stronger than the base metal itself. If the surface of the metal upon which aluminum-bronze weld is to be deposited is heated

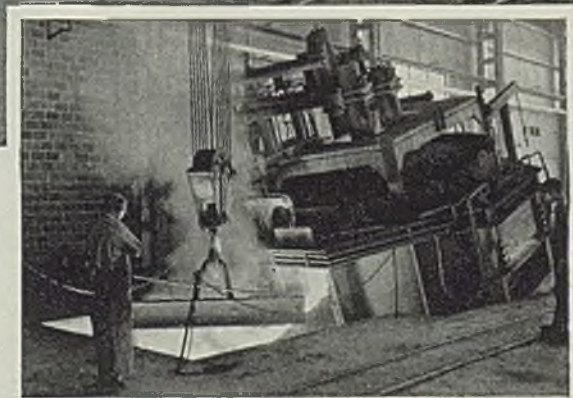
From left to right are grain structures in Grades 12, soft; 16, tough; 18, strong; 20, hard; 21, very hard; 22, extremely hard



Five *Heroult* Electric Furnaces serve *Rustless Iron and Steel Corporation* in their new *Baltimore Plant*



Heroult Electric Furnace — Type 15. This furnace embodies the latest design in all-welded and reinforced construction. Special features include low-inertia electrode winches and roller bearing electrode arms—resulting in high sensitivity of control for the production of low carbon “Rustless” steels. Built by American Bridge Company for Rustless Iron and Steel Corporation’s new Baltimore plant.



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UNITED STATES STEEL

to a temperature approaching fluidity, the weld metal will flow freely and good fusion will result. Due to the small area heated by the torch, little or no change occurs in the structure of iron or steel.

In welding nonferrous alloys with an oxyacetylene flame, the work must always be done in the forehand position, using a neutral to slightly oxidizing flame. A small area of the base metal should be brought to a high cherry red and the flame withdrawn sufficiently to permit the end of the weld rod to be melted by the outer envelope of the flame and deposited onto the heated area. Never allow the inner cone to come into direct contact with the welding rod because a low temperature is best for the bronze alloy rod.

The slag coating of the rod assures correct fluxing of the molten metal. Melting at a temperature near 1800 degrees Fahr., the free-flowing characteristics of the rod enable the operator to apply it with the usual gas equipment. A thorough ventilation of the welding enclosure is recommended.

In metallic arc welding, care must be taken to keep the length of arc constant. The weld rod should be applied at a steady rate of speed for a uniform weld deposit.

The proper length of arc is determined by the size of the electrode and the material being welded. Whenever possible, it is suggested that a "figure 8" movement of the electrode be employed, thus spreading the heat over a wider area and preventing the possibility of undercutting along the edges of the weld. The figure 8 method increases heating of the base metal to a molten or plastic state, so good fusion will result. It also aids in

eliminating porosity and entrapped slag by keeping the weld metal molten underneath the slag coating.

Since the positive electrode develops two-thirds of the heat of the arc, it is recommended that reverse polarity (electrode positive) be used in metallic arc welding. Globules of molten metal deposited on the weld work have a tendency to spread out into a crater, due to the drive of the arc. At the end of each bead, this crater can be entirely filled by shortening the arc until the rod itself short-circuits against the work.

Table II indicates recommended currents for 3/16-inch rod on materials and work thicknesses frequently encountered. For 1/8-inch rod, currents should be 50 per cent less; 1/4-inch rod, 33 per cent more.

Carbon arc welding differs from metallic arc welding in that a straight polarity (electrode negative) is always used, and the weld rod is fed into the arc stream formed between the base metal and the carbon or graphite electrode. The manner of feeding the weld rod into the weld is similar to that employed in the oxyacetylene process already described. Table III shows recommended sizes and amperage for carbon arc welding.

All metals undergo structural changes as a result of the heat generated during the arc welding operation. These changes are greatly affected by the rate of cooling from the molten state of the weld metal. Quite often such structural changes can be compensated for or modified by preheating the base metal and depositing multiple beads.

In general, however, there is no necessity for preheating low-carbon

steels that may be welded readily. Steels of higher carbon content, 0.30 per cent or more, require preheating to prevent cracks. It might also be well to caution regarding the formation of carbon gases due to the excessive heating of high-carbon ferrous metals. High-carbon steels and cast iron should not be heated by the welding arc for too long a period.

Should the weld become brittle due to rapid cooling of the high-carbon constituents, this condition can be corrected by a heat treatment consisting of reheating to 1400 degrees Fahr. maximum followed by furnace cooling in the case of small sections. Large sections may be air-cooled. Heat treatment after welding tends to lower the tensile strength slightly and increases the ductility. It also results in slower contraction of the weld and base metal, thus minimizing any tendency to develop cracks. However, annealing after welding will not remedy troubles encountered during the welding process, such as porosity and slag inclusions.

Low Welding Current Advisable

In welding wrought or cast iron, it is recommended that rod no larger than 3/16-inch diameter be used. The welding current should be held as low as possible, and only about 2 inches of weld deposited at any time, followed by a thorough wire-brushing in preparation for the subsequent bead.

In overlay welding of cast iron, it might be well to mention that two layers should be applied to provide an overlay of sufficient thickness if machining is required later. Then after machining, the finished surface will fall within the outermost layer. The reason for this recommendation is that the layer of weld metal closest to the ferrous base contains iron structures which are brittle and difficult to machine.

Overhead welding usually calls for a shorter arc and correspondingly lower voltage than that in the downward position. Welding machines with a separately excited field have a manual control which allows the voltage to be regulated for overhead or downward welding. Those machines which have no independent voltage control may cause slight inconvenience in welding at the lower current ranges.

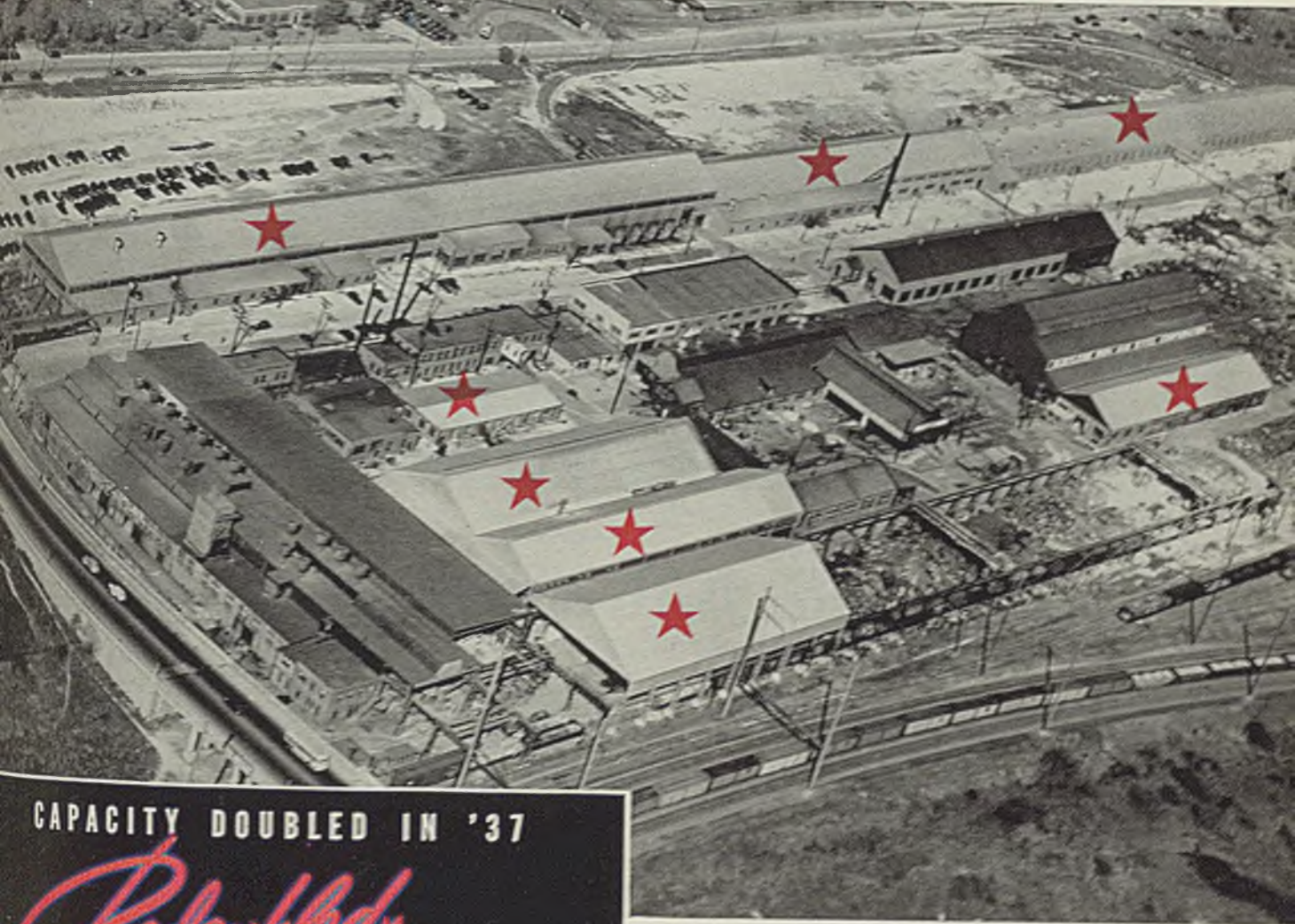
The use of a short arc offsets this difficulty, which usually is experienced with the longer arc. A short arc decreases oxidation of the deposited weld metal along with spatter as well as the tendency to produce rough, irregular weld deposits. The short arc also tends to increase the puddling action, which is essential to good fusion, minimum porosity and minimum slag inclusions.

Arc-Welded Frames for Cranes



■ Note, here, all work of arc-weld joints will be made in the frame of this 15-ton craning crane when it is completed by Lewis Welding & Engineering Corp., 88 Addison road, Cleveland. It will weigh about 3000 pounds and contain more than 70 pieces of various grades of steel. Pieces used on this are turned out of wire of less a month by the company. Courtesy General Electric Co., Schenectady, N. Y.

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General view of strip mill slab yard showing scarfing beds and facilities provided for handling material

Scarfig Billets and Slabs

Beds laid out to accommodate eight crews which manipulate 3-foot torches equipped with six preheat and one high-pressure port. Gas handled through piping system designed with many safety features

■ **CONDITIONING** the surface of billets, blooms, slabs and other intermediate shapes by burning out defects with oxyacetylene, a process generally known as scarfing, has become current practice in most steel plants. Compared with chipping, the method formerly used, scarfing offers important advantages, such as lower cost and greater speed of operation, and in certain cases smaller space requirement. With proper training a scarfer is soon able to remove all common surface defects such as seams, scabs, slivers, tears, laps, etc., as effectively as can be done by chipping or grinding.

At the Lackawanna, N. Y., plant of Bethlehem Steel Co. scarfing is carried out at two points, in the general billet yard and in the slab yard of the continuous sheet and strip mill.

Three billet scarfing beds are used, each 39 feet long, extending the full width of the building. Windows in the side and endwalls of the building, and in the wide roof

monitor provide an abundance of daylight. The skids or scarfing benches are laid out to accommodate all sections and lengths of billets and blooms. They can be moved about by magnet hoist to accommodate different sizes. One bed, used for scarfing 2½-inch and 1¾-inch billets, is equipped with 24-inch high skids, the other two beds, used for sizes ranging from 4 x 4 to 9 x 8-inches, have 18-inch skids. The steel scarfed is generally of the low-carbon or medium-carbon type.

A scarfing crew is made up of one scarfer, one inspector, and one cleaner. An extra cleaner also is assigned to every two crews, helping where he is most needed, to prevent any crew from falling behind. The different steps in the operation must be properly co-ordinated, so that the scarfer always has sufficient work ahead. Ample space is provided to prevent loss of time due to crowding. A total of eight crews may work at the same time, without any trouble.

The steel is placed on the beds

in 12-ton lifts and laid out by the cleaner, who also turns it when one side has been completed. Billets are turned with hand wrenches, heavy booms with turning hook, and bars.

Prior to inspection the steel is cleaned with a wire brush, to remove loose scale and to expose the surface defects which are marked by the inspector. Scarfig is carried out with a 3-foot torch, equipped with a tip having six preheat ports, and one good high-pressure port.

The scarfer moves the torch along the surface of the steel, cutting a path the depth and width of which are governed by the speed of the movement. A series of parallel cuts are taken when wide defects are removed, and when the entire surface is taken off. In making parallel cuts it is important to produce clean edges, free from partly oxidized metal and sharp fins. The tendency to finning is to some extent governed by the grade of the steel. Low-carbon steel, for in-

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KARBATE**
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"Karbate" is a brand of material, of carbon or graphite base, which is impervious to the seepage of fluids under pressure. Graphite and "Karbate" No. 2 have high thermal conductivity and excellent heat transfer properties.

CONSTRUCTION MATERIALS

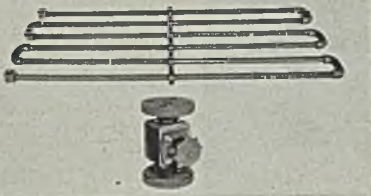


Carbon and Graphite Brick, Flat Tile, Blocks, Beams and other structural shapes are used for the construction or lining of many types of processing equipment because of their high resistance to corrosion and their ability to resist the destructive effects of severe thermal shock. Graphite construction materials are used where high thermal conductivity is needed.

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Carbon, Graphite and "Karbate" pipe and fittings are available in sizes from 1/2 inch to 6 inches I.D. Saunders type valves of "Karbate" construction are also available. These corrosion resistant products are used for the construction of drain lines, heating coils — both steam and gas-flame types, and other types of conveying, circulating and heat exchange equipment. Carbon or "Karbate" No. 1 is recommended where high heat transfer properties are not desired. Graphite and "Karbate" No. 2 pipe have heat transfer properties equal to steel pipe of corresponding I.D. Plain Carbon

and Graphite pipe and fittings are sufficiently impervious to convey fluids at low pressure without disturbing seepage. Graphite pipe heat exchangers are being used to heat corrosive baths with low pressure steam and eliminate the dilution resulting from injection of steam in the bath. At higher pressures, or where all seepage must be prevented, "Karbate" materials are recommended.

CARBON INGOT MOLD PLUGS



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Scarfer conditioning the surface of billets

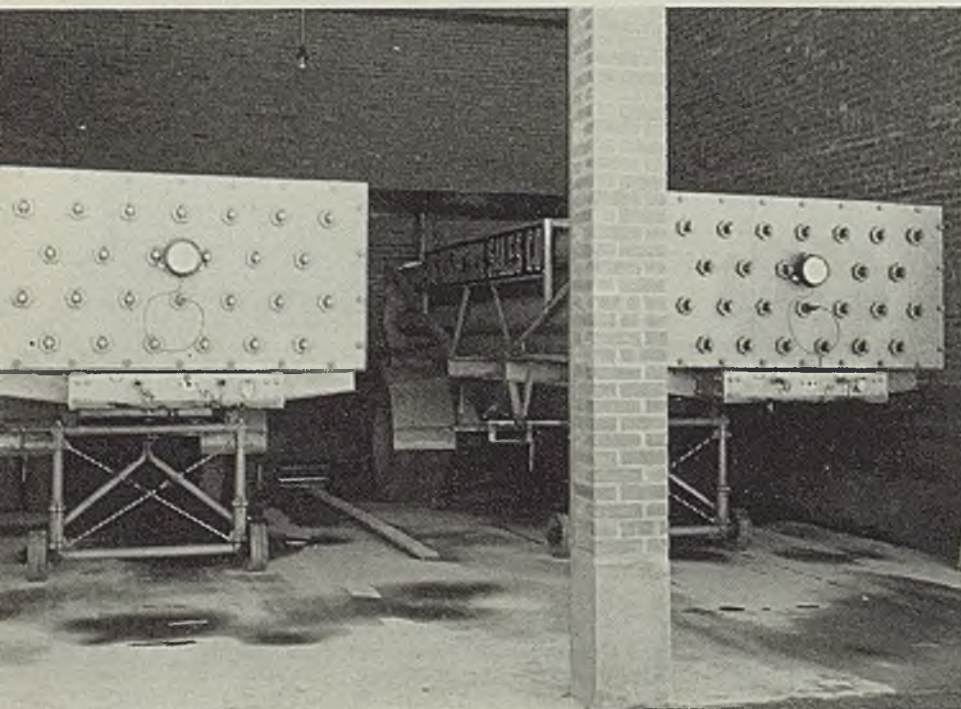
stance, has a greater tendency to form fins than high-carbon steel.

After the scarfing has been completed the cleaner removes flash and slag with a chisel bar and wire brush. The inspector then goes over the steel, to make sure that the defects have been properly removed. If not, they are marked again, and the scarfing is repeated until a satisfactory surface has been obtained. When all sides have been scarfed the steel is piled in crane lifts for

transfer to the billet yard, or assembled in bundles of proper weight for shipment.

Due to the many variables involved, production figures are difficult to appraise, and must always be viewed in the light of the type and the condition of the steel scarfed. In scarfing billets and blooms an output of 7 to 9 tons per torch hour may be considered a fair average, with an oxygen consumption of 50 to 60 cubic feet per ton

Type of trucks used for delivering oxygen to strip mill slab yard



of steel, and an oxygen-acetylene ratio of about 20 to 1, by volume. The cost of oxygen and acetylene is normally about a fourth of the total scarfing cost.

Handling of Gases

Elaborate precautions are taken to insure safe and efficient handling of the gases. Acetylene is purchased in cylinders of 275 cubic feet capacity and stored in the gas distribution building adjacent to the billet yard. This is a 1-story brick structure consisting of an acetylene manifold room, acetylene storage room, oxygen control room, and a covered oxygen trailer station, open at the front.

Four banks of six cylinders each are hooked up to the main acetylene line through manifolds. Only two banks discharge at a time, the other two being held ready to cut in when the first are exhausted. A pressure of 9 pounds per square inch is maintained in the acetylene line.

Each cylinder discharges through an individual water seal. A larger water seal also is provided in the main line at the exit where as a further precaution the line is equipped with a branch extending through the roof of the building. This branch line is covered with a burn-out disk of low-melting metal. In case of a flash back from the scarfing beds the disk will instantaneously melt, diverting the flash to the atmosphere. Mechanized flash-back arresters are also provided in the pig tail lines leading from each cylinder to the manifold (in addition to the permanent arresters built into the cylinder valves).

During discharging the valves are opened about only a quarter turn, so that a bank can be turned off quickly in case of emergency.

The temperature in the manifold room and in the acetylene storage is kept from 80 to 90 degrees Fahr., which has been found to give the best condition for discharging. A supply of six to eight dozen cylinders is generally on hand in the storage.

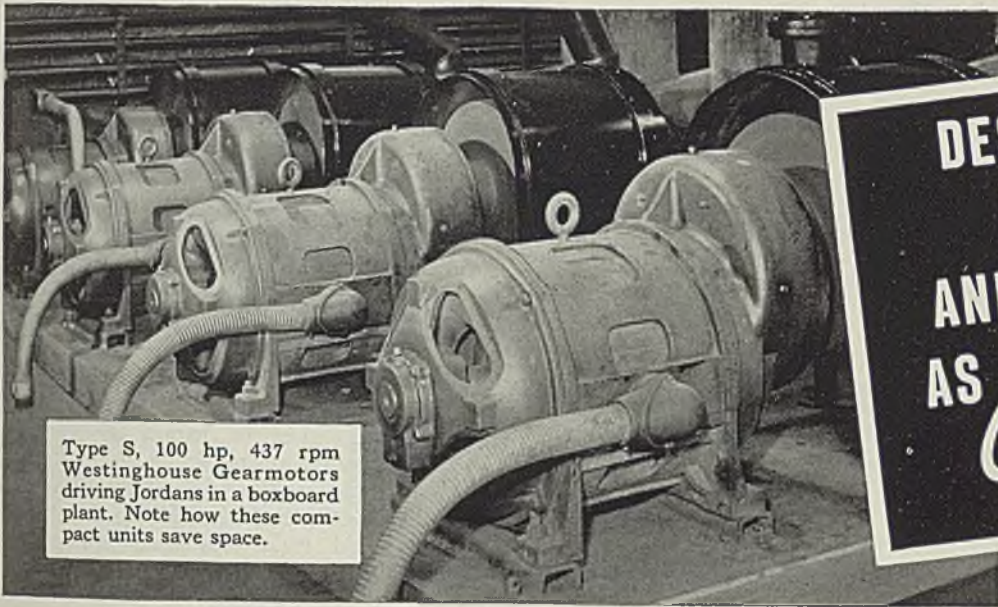
The building is equipped with roof ventilators. All light fixtures are vapor proof, and the electric switches are placed on the outside of the building. The hand truck used for handling the cylinders is equipped with rubber tires to prevent any danger from sparks.

Oxygen is supplied from trailers of 40,000 cubic feet capacity and 2200 to 2400 pounds pressure. Two trailers are always kept on hand, one discharging, the other ready to be cut in. In discharging the pressure is reduced to 110 pounds. A siren blows a warning signal if the line pressure drops below 90 pounds.

Oxygen is conducted to the scarfing bed in a 3-inch pipe line, made

(Please turn to Page 78)

WESTINGHOUSE GEARMOTORS



Type S, 100 hp, 437 rpm Westinghouse Gearmotors driving Jordans in a boxboard plant. Note how these compact units save space.

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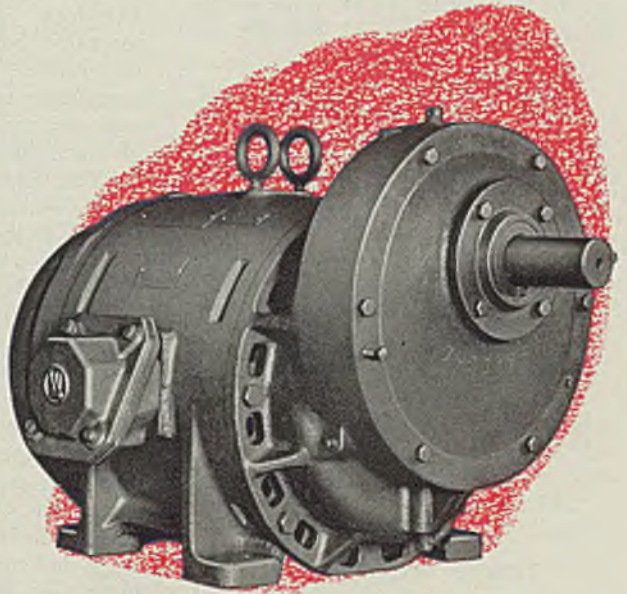
Westinghouse engineers have made it easy to select an efficient stock slow-speed drive and get maximum performance for all types of applications. With a Westinghouse Gearmotor trouble-free service and low maintenance is assured because Westinghouse Gearmotors are *designed, built, and tested* as complete units.

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Westinghouse

GEARED DRIVES



BETWEEN HEATS

WITH *Shorty*



■ Say fellers:

I was goin' over to the bessemer department the other day to watch the boys change bottoms on one of the vessels, 'n as I was passing through the mixer building ol' Ty Davis stops me and sez: "Y' know, Shorty, it's a good thing Capt. Bill Jones thought of havin' a mixer 'round where there 's some bessemers blowin', or we'd be makin' a mess of things nowadays."

Jus' as soon as he mentions Capt. Jones' name I recalled that Ty's dad worked for the captain back in the 70's at the ol' Edgar Thomson Steel Co. at Braddock, Pa. 'N so I sez to Ty: "Come on in the scale house and mebbe y' can tell me somethin' interestin' 'bout the captain."

'N when we get seated inside—Ty on the one end of 'is desk 'n me on the swivel chair—he sez, "Whadda ya mean somethin' interestin'?"

"O somethin' your dad might 'ave told you 'bout the captain when they were knockin' out tonnage with the little bessemer vessels back in their day."

"Let's see," he sez. "Dad told me once 'bout the captain takin' a trip to Tennessee. Seems as though a feller by the name of Lloyd left Pittsburgh to become superintendent of a little stack in Chattanooga. A few days later Capt. Bill followed the Lloyd family cuz he was sweet on Harriet Lloyd and by gosh he married her before he left the South."

"Whaddaya mean 'fore he left the South?"; I sez.

Trouble Started Brewin'

"Y' see the captain helped build the little blast furnace his father-in-law was runnin' 'n then he started workin' in Webster's machine shop 'n then he started runnin' a billiard room. But matters got pretty hot for northerners in Chattanooga 'n gettin' in a row with a crowd of young bloods, Capt. Bill cleaned out the whole lot in short order with a billiard cue."

"Anyone get hurt?"; I sez.

"Naw but the cops arrested Jones. He knew a lot of 'em though and that night they took 'im to the railroad yards, put 'im in the cab with the engineer 'n when he got to Nashville

he got on another engine goin' to Louisville. Jones worked his way on a boat to Cincinnati and Pittsburgh 'n finally landed in Johnstown, Pa.

"Understand the captain helped, designed, erected and perfected the ol' bessemer plant at Johnstown?"; I sez.

"Yeh, that's what dad tol' me. He was the right-hand man of George Fritz, the superintendent. Guess when Fritz died all the fellers sort of 'xpected that the captain would fall into 'is job but they gave it to someone else. The captain resigned but he tol' 'is boss he'd stay 'till the erection of the iron truss roof over the rollin' buildin' was finished. Guess 'is boss didn't want it that way so Jones left and went to work for William P. Shinn, head of the Edgar Thomson Steel Co. at Braddock. He started in as master mechanic but 'twasn't long 'fore he was super. The first seven blast furnaces were erected under his direction and supervision. Dad sez the fellers all liked the captain."

"Yeh, I understand they did," I sez.

"Jus' to show y'. You've heard 'em tell of the Johnstown flood, haven't y'? Well when Capt. Bill heard 'bout the thing, he sez to the fellers 'round his plant, 'Boys, we gotta give the Cambria boys a helpin' hand.' 'N you know what he did, Shorty?"

"Naw," I sez. "What?"

"Well, sir, the captain loaded a big gang of the Edgar Thomson fellers on a flat car and headed 'em toward Johnstown. They helped the boys at the Cambria plant with the cleanup work and then came back to their own plant and reported to Captain Bill."

"Whaddaya know 'bout the captain and 'is mixer?"; I asked.

"Nothin' much 'cept he got sick 'n tired of the bessemer havin' to work up iron of all kinds of analyses with sulphurs and silicons on the high and low side and he sez, 'we gotta have a vessel big enough to hold a lotta hot metal so when we pour 'er in, she'll come out with a uniform analysis.' 'N so he designed one somethin' like a tea pot 'n she did the work right from the start. Dad sez after they got 'er workin' the bessemers went to town on tonnage."

"Guess you're right 'bout the mix-

er, Ty, when y' say she was one of the most important inventions in the development of the bessemer process. Fac' is, mixers like the one we got outside this scale house here holdin' 1200 tons of hot metal was a life-saver even to open-hearth shops. Whaddaya say? You agree?"

"Yeh, you're right. It would be a funny chargin' floor that didn't have a mixer buildin' at the end of 'er."

"Guess Capt. Bill never lived to see the patent papers on his mixer issued, did he, Ty?"; I sez.

Replies in the Negative

"Naw, don't think so. But he got word from Washington 'fore he died that 'is patent was allowed. Wish he could see this here mixer turnin' over when she 's pourin' out a few tons for the tiltin' furnaces down on the end of the chargin' floor," sez Ty, doublin' up his fist 'n usin' his thumb to point over 'is shoulder to the cylindrical vessel outside the scale house. "It'd make 'im sorta feel good, I betcha."

"Yeh, s'ppose so. Sorta tough on a feller to pass out of the picture when he 's ringin' up on 'is cash register \$50,000 a year, eh? Understand that was 'is salary and share in the profits."

"I remember of my dad comin' home from the plant the day the gas 'xplosion at one of the blast furnaces, and tellin' us all 'bout it that night at the supper table. It was on a Thursday, Sept. 26, 1889. The captain got pretty badly hurt 'n he died a couple of days later. Dad sez to us boys, 'Men are always doin' two things—buildin' houses and diggin' graves. Houses to live in 'n graves to lie in. The leaves soon will be fallin' 'n they'll lie 'round in the woods, protectin' the roots and nourishin' the growth of the bush 'n tree. 'N so the past lives on 'n looks at us from under the eyebrows of the present."

"Guess Capt. Bill Jones was like your dad sez, Ty. He puts 'is mixer on paper, we get the idea 'n the vessel outside the window here stands as a monument to 'is name."

* * *

Well, fellers, that 's the story of Capt. Bill. 'N when you're walkin' down the chargin' aisle past your open hearths, I sorta feel that your ears will catch the echo of the motor as she starts the mixer pourin' 'n that your memory will name the designer who made one thing lead the way to a world of better things in the shop where steel is made.

Well so-long fellers.

Shorty Long

STEEL

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Standardization in the Steel Industry

Principle makes for efficiency and economy in production and eliminates confusion in performance of a wide variety of steel and alloy grades. Underlying information is being codified

IN THE STEEL INDUSTRY, standardization has not been irrationally revered, but it has not, by any means, been treated as a stranger. Almost 50 years ago the Association of American Steel Manufacturers, after due experiment and investigation, adopted a set of standards relating to the physical properties and chemical composition of boiler plate, structural steel and rivet stock. The specifications served a useful purpose in their time, but with continual advancement in the technique of steel making and with new requirements arising in the trade, they became obsolete and have long since been superseded by others.

Of Longstanding Importance

Standardization of products, which is logically of more direct interest to the consumer than standardization of processes, has been playing an increasingly important role in the steel industry for several decades. One of the interesting examples is the standardization effected in the series of wide flange beams, whereby the respective numbers produced by the several manufacturers are readily interchangeable. The provision of the convenient and logical geometric series of beams was, of itself, an effective move toward simplification and economy; the added feature of interchangeability enhanced the value of this whole project for the structural industry. Similar benefits were realized when sheet steel piling was rationalized as to design, then standardized, and produced in sections best suited to meet the conditions encountered in engineering practice.

Pig iron is regularly produced in

By R. E. ZIMMERMAN

Vice President in Charge of Research
and Technology
U. S. Steel Corp., Pittsburgh

grades which have been set up as standard for specific purposes. Each fully integrated steelmaker may produce whatever kind of iron he chooses for his own open-hearth or bessemer operations, but he does not have any such leeway in supplying iron for foundry purposes. As a matter of fact, even in the case of the metal intended for conversion into steel, the supposed degree of freedom is something of an illusion, because economic considerations as well as metallurgical factors demand that iron for open-hearth and bessemer practice be held to certain properly determined standards.

The circumstances that many steel products fall into the category of capital goods attaches a special significance to the standardization of their properties. Large users of steel, fabricators and manufacturers, are accustomed to draw upon more than one source of supply for their materials, often for the production of the same or identical parts. This means that the performance of steel from the different sources must be substantially uniform, or in other words, it must be produced to meet definitely prescribed standards. Drawing and machining qualities, weldability, resilience, hardenability, resistance to elongation at elevated temperatures, and electromagnetic characteristics

are examples of properties which must be controlled within specified limits if market participation is to be expected. The kind of standardization necessary to provide for the conditions just described affects a wide variety of steel products, such as bars, sheets, wire and tubing in both carbon steel and alloy grades.

Explains Increased Costs

To illustrate one of the important factors which makes a reasonable degree of standardization attractive to both producers and consumers, some recent words on the subject will be repeated or paraphrased as follows:

Diversification tends to diminish the tonnage involved in the various items scheduled for production in the steel mill. Needless diversification and the small order walk hand in hand. Now the steel producer is not at all unappreciative of small orders, particularly when conditions are such that they may be combined and consolidated for execution at the mill. A hundred relatively small orders, if they involve only standard products without much variety need not present a serious problem as to melting, rolling or processing. As variety increases, however, the expense of production mounts rapidly. To roll only 5 tons of a certain selected shape costs \$8.80 more per ton than to roll 100 tons; in another case the added cost amounts to \$12.95, and in a third instance the excess is more than \$15 per ton. Figures applying to 1 ton, as against 100 or 50, or even 5 tons, are almost startling, for the addi-

From a paper presented before the National Association of Purchasing Agents, Cincinnati, June 3.

(Please turn to Page 86)

QUICKER DELIVERIES OF ALLOY STEELS



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Finishes

HOT ROLLED; MACHINE STRAIGHTENED; TURNED

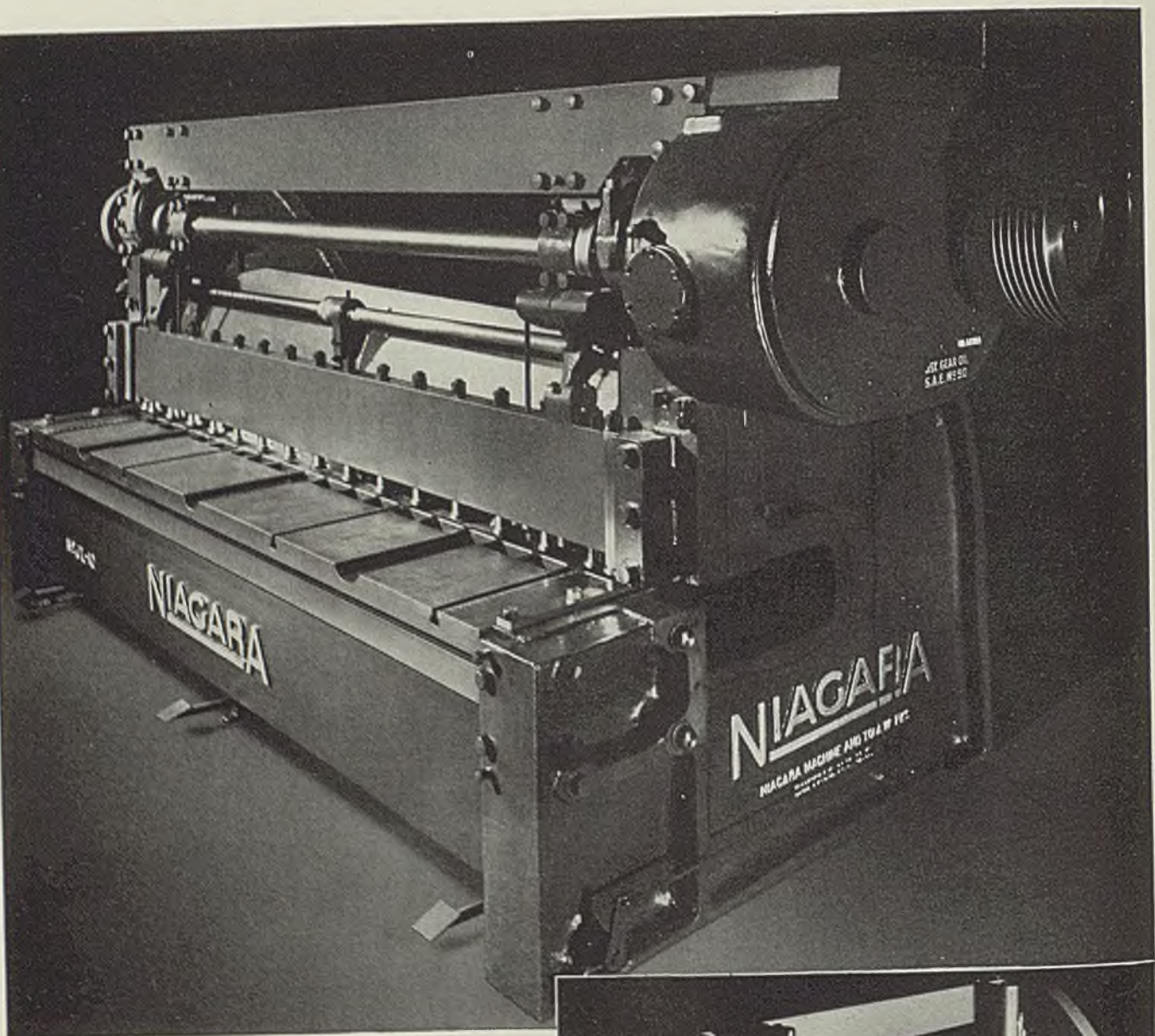
Conditions

AS ROLLED; HEAT TREATED; ANNEALED
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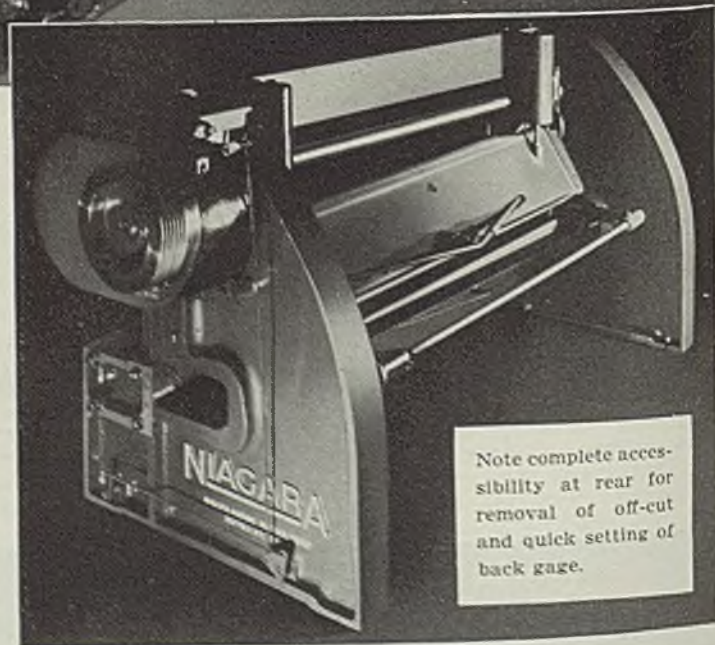
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Niagara Power Squaring Shears are built with capacities up to $\frac{3}{4}$ inch and all cutting lengths. Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo, N. Y. Branches: Cleveland, Detroit, New York.



Survey Shows

Modernizing Handling Equipment Speeds Production, Builds Profits

Case histories reveal modern handling facilities increase production as much as 80 per cent by cutting out potential "bottle-necks". Also lessen floor wear considerably and increase safety

■ FULL SPEED ahead on production. Speed, speed and more speed are essential to adequate defense. A survey just completed for STEEL in eastern metalworking plants discloses definitely that capacity of handling systems is only 70 per cent of production capacity; that top production speed cannot be attained if intraplant transportation is obsolete or inadequate.

About 15 per cent of the plants visited had purchased modern materials handling equipment during the past year and their managements reported that they could not begin to handle the increased business stimulated by defense or make as substantial profits, had they retained their old industrial rolling stock because it was too slow and inadequate to meet the demand for speedier movement of products throughout the plant.

Our survey revealed that modern materials handling equipment increases production speed and decreases production cost, two definite objectives that metalworking plant managements must attain these days if they expect to do their bit in making America safe for Americans and their business safe for profits.

During previous surveys for STEEL, we have casually inspected the intraplant methods of handling goods and found vast room for improvement. That condition we now find still exists but there is a noticeable trend toward modernization of

By FRED MERISH
Pompton Lakes, N. J.

methods and equipment stimulated by the demand for speedy output of defense orders. However, not more than 30 per cent of the metalworking plants covered on our itinerary were taking advantage of the modern facilities available for speeding up intraplant haulage.

About 70 per cent of the plants visited could achieve greater production speed in all departments, avoid congestion and minimize delays by replacing older units with streamlined models or using mechanical devices to facilitate industrial haulage now done by hand. In all these plants, deliveries were falling behind the increasing inrush of orders because there were too many "bottle-necks," too much lost motion due to unnecessary rehandling of materials, too many congested points choking production and holding back the steady flow of materials in process. All of these "bottle-necks" can be removed by modernizing the materials handling equipment.

Intraplant movement in all departments came under our scrutiny, raw materials receiving, raw storage, fabricating operations, including stamping, forging, machining, welding, heat treating, forming, surface finishing, warehousing, shipping, issuing from stock and assembly. In 60 per cent of those

departments needing modernization, we found that obsolete equipment was slowing down production schedules, in the remaining departments products were being moved by hand when devices are available to do the work faster and more economically. We found room for improvement in every department of metalworking, from raw materials to finished "package," from unloading through manufacturing, packaging, storage to outward transportation. There is no valid reason for this deficiency in these crucial times because modern materials handling equipment may be purchased to meet all moving tasks reviewed on this field study, to provide the speed necessary to turn out production to the tempo of preparedness demand.

Materials handling equipment reviewed on this field study may be classified as follows:

Industrial rolling stock: Floor trucks, tractors, trailers, tractor-trailer trains.

Lifting equipment: Lift trucks, stackers, tiering machines, jacks, hoists, cranes, elevators, grabs, cradles.

Conveyors, chutes, slides.
Die handling equipment.

Equipment built specially to plant requirements.

Accessories: Casters, rubber-tired wheels, platforms, pallets, skids of various types such as rack body, stake and bin; remote control de-

vices, tote boxes, stock boxes, safety stops, storage racks, scoops, forks, rams, crane hook adapters.

Space does not permit a detailed report of all equipment reviewed so we give the highlights and offer a few typical case histories taken from the many on our survey work sheets to show that the modernization of materials handling equipment is essential to production. We reviewed a wide variety of

fourth the time required by older methods, sometimes less—and replace the die with the same speed when desired.

Many were the uses to which the modern units were put in some of the plants covered. Batches of materials in tote pans on conveyors were deflected at a number of stations in one machining department, lift trucks handled forgings on skids, stacked tote boxes, moved

tion to handle the increased storage, which had been contemplated, thus saving this concern a substantial outlay of working funds.

In some plants, we found modern power trucks doing guard duty around processing machines, spotting products for process very near the machines and picking them up after operations, thereby opening up those deadly "bottle-necks" found so often around machines, relieving pressure in aisles and speeding up output all along the line.

Materials handling equipment, singly or in group, is flexible enough to adapt itself to every loading, unloading or intraplant transportation problem, which it will solve economically and efficiently if properly co-ordinated to suit demands. For example, one management was having trouble taking materials to and from stores. A combination lift truck and storage rack system was installed, multiplying floor space four times, reducing the handling of parts by two-thirds and increasing efficiency and speed of operation at least 5 per cent. The elimination of lost motion, speedier loading and unloading effected additional economies.

This installation kept men and machines busier, permitted the plant to increase production substantially without adding floor space, minimized confusion and waste. Parts and materials are now stored or brought to machines quickly—no undersupply of materials holding up workers, no oversupply hogging space when not wanted.

Executives interviewed where modern materials handling equipment had been installed reported production speed-up, in one case, estimated at 80 per cent in the

A *N investment in modern handling equipment totalling only 10 per cent of first cost of production equipment may reduce manufacturing costs as much as 50 per cent*

units, conveyors of many types, apron, belt, chain, slat and oven; trucks and lifting equipment, hand-operated and motor-driven, portable and stationary elevators, forked trucks for delivering coiled wire from box cars and tiering them high in warehouse racks, high lift trucks and low lift trucks, hand trucks with removable platforms to eliminate unnecessary handling, tiering machines to tier to ceiling, heights impossible to reach with hand labor, portable hand cranes and cranes with hairpin hooks to handle rod in bundles, spiral chutes to lower parts, conveyors carrying finished products from assembly lines to packing room to storage to shipping department to loading platform to box car, high-speed hoists from ¼ to 40-ton capacity, truck cranes for unloading cars of long bar stock, plates, heavy boxes, etc., overhead handling equipment of various types with cradles, grabs and even scales attached to eliminate rehandling for weighing, tractors, trailers and power trucks "tailored" to fit the job, high lift, low lift, platform, elevating, ram, fork, tilting, tiering and pallet.

Six plants had purchased power trucks for handling dies, three plants purchased portable lifters for this purpose. Superintendents reported that die-handling time was cut in half after modernization. The die truck speeds up operations 30 per cent or more in some departments by reducing idle press time and accelerating the movement of dies to and from storage. Die handling is an expensive, dangerous job where handling equipment is obsolete and dies run high in tonnage. Big savings are possible in handling and setting heavy dies. A die truck can snake a 5 or 50-ton die out of a press with a winch, deliver it to outdoor storage yard or indoor storage rack in one-

stampings, transported tin plate and sheet steel in and out of warehouse, fed machines with materials, kept stock at proper machine height for continuous feeding so that there were no "air pockets" in production, loaded highway trucks, were used for re-lamping and servicing overhead factory lighting. Yes, modern materials handling equipment is tops in flexibility, which, with the big variety of modern units available, makes for many unusual adaptations and combinations of loading, unloading and plant hauling operations.

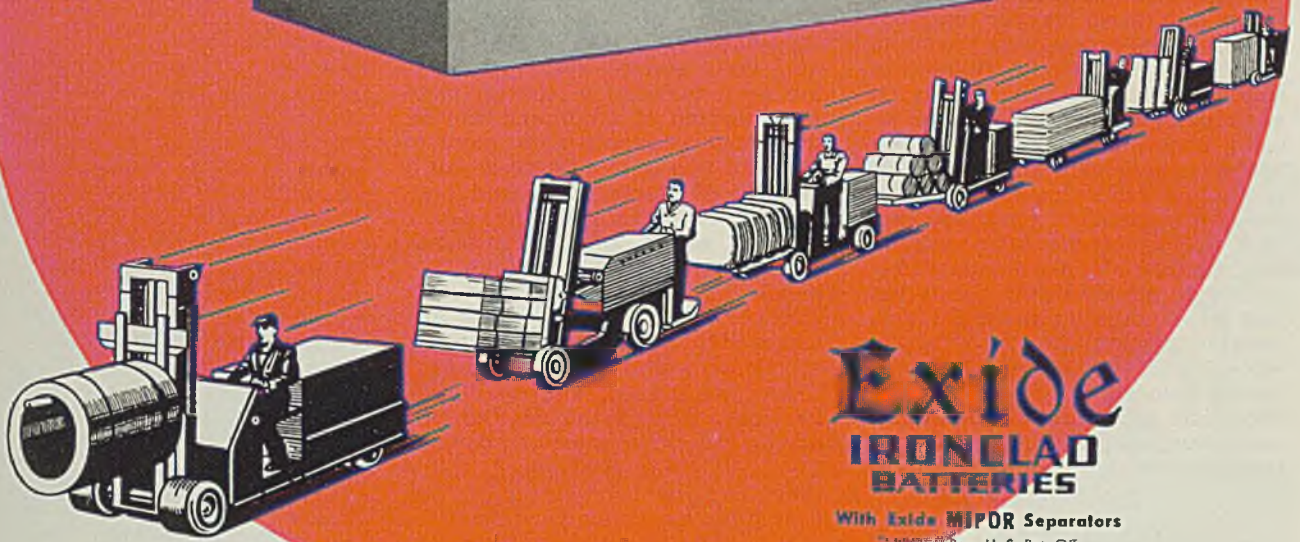
In one New England plant, skid loads of stampings on hand-lift trucks were coupled to a power tractor for long-haul work. Materials are heavy in this plant, so the management decided to utilize skids in combination with hand-lift units and industrial tractors. Result was a speeding up of opera-

A *TIN-PLATE user saves \$72 per car by equipping his plant to receive loads on pallets as tin-plate supplier saves 10 cents on every base box of plate loaded on pallets and passes this saving on to his customers*

tions of nearly 40 per cent. Skids of various kinds were utilized to excellent advantage in a number of plants reviewed.

Another unusual adaptation was found in a New York plant where conveyors with tiering machines provide a means whereby the management can utilize the maximum cubical content of the warehouse, increasing space formerly available by about 60 per cent and eliminating the necessity of building an addi-

machining department. Yet other plants reviewed were as obsolete as pack horses or prairie schooners on industrial haulage. We noticed too many overloaded trailers and trucks, equipment that was adequate years ago when stampings were lighter but not robust enough now to handle the weightier stock. There also was too much handwork done. Also, too much rehandling of materials kept production in low, a defect easily corrected with mod-



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ern power trucks, hoists and conveyors.

Up to here, we have discussed materials handling equipment from the standpoint of speedier production. Its ability to cut costs was also definitely established on this field study, and is of equal importance because the lower the costs, the higher the profits. In these days staying out in front is not only a matter of turning out production at top speed but of keeping

efficiency, and now eliminated with tractors and lifters. When sharp-edged materials, such as sheet steel, are handled with modern pickup devices, the danger of injury to hands is minimized. Jolting, jarring overloads rolling over battered floors bring danger to operators and damage to materials. Because of the heavy loads handled in his plant, one manager felt squeamish about purchasing lifting equipment fearful, at first, that

chines. After a conveyor system was installed in combination with power trucks and hand-lift machines, handling time was reduced to 25 per cent of process time or 11 hours handling materials for every 44 hours processing them. Compared to the cost of processing machinery used in metalworking plants, the investment in materials handling equipment is not high. Some plants invested less than 10 per cent of the first cost of their processing units in modern handling equipment. Yet this comparatively small outlay may reduce costs as much as 50 per cent.

POWER truck is designed to place floor-to-ceiling tier in box car at each trip—eliminating handling and stacking by hand—cutting loading time 35 per cent in addition to lowering costs

costs at minimum to meet competitive prices and to checkmate higher wages and taxes. Proper materials handling equipment cuts costs in many different ways: It reduces direct and indirect labor costs; it minimizes costly "time out" for repairs, abnormally high on obsolete haulage equipment; it maintains production schedules easily as expensive production tools are not kept waiting because of poor routing of materials, a common defect noticed in metalworking plants visited where obsolete materials handling equipment did duty; it provides increased storage space, minimizes damage and rejections, reduces idle machine time, minimizes costly rehandling of materials and products, decreases accidents and keeps floors and aisles free of congestion.

The maintenance of equipment, floors and stock is much lower on modern units. Repair bills on new equipment averaged about 15 per cent of the same expense on obsolete units, said the modernizers interviewed. In some plants, 10 to 20 per cent of the trucks were out for repairs all the time, old jalopies wasting profits in many different ways, from high maintenance on their own aged bodies to high labor costs on processing machines. Floors in these plants were bad. Old equipment ruins floors. The easy swiveling, easy rolling casters and wheels, sometimes rubber-tired on modern units, greatly increase the life of floors and equipment.

A big reduction in accidents was reported after new equipment was installed, particularly where tiering machines had replaced hand piling. One superintendent stated that lifting heavy pieces caused strained backs and hernias, obviously a bane to production effi-

ciency, and now eliminated with tractors and lifters. When sharp-edged materials, such as sheet steel, are handled with modern pickup devices, the danger of injury to hands is minimized. Jolting, jarring overloads rolling over battered floors bring danger to operators and damage to materials. Because of the heavy loads handled in his plant, one manager felt squeamish about purchasing lifting equipment fearful, at first, that

the tiering machines contemplated could not safely or efficiently move around the floor with heavy loads suspended in midair. When the new units started operating, picking up a ton skid of the tin plate from the top of a pile and moving it without assistance from place to place he was soon convinced. In a number of plants, we found platform lift trucks handling heavy tonnage easily and safely, loads that obsolete equipment could not handle. Modern equipment is built stronger, for easier operation and longer life. Side sway was noticed in all plants where obsolete hand-lift trucks were used, and side sway hastens wear and wobbles the load dangerously, increasing the damage hazard. Users interviewed stated that skid and hand-lift trucks are useful for the many short hauls in a metalworking plant.

RPAIRS on new handling equipment average only 15 per cent of same expenses on obsolete units. Tiering machines increase storage space 60 per cent—eliminate need for building new warehouses

Space is not available to detail all the case histories gathered in regard to labor savings but here is one, typical of many others on our survey work sheets, that shows how unprofitable it is to use obsolete materials handling equipment. In one New York plant, before modernization the handling time ran about 80 per cent of production. In other words, for every 44 hours of processing, 36 hours were spent bringing materials to and from ma-

only a tremendous saving in labor but a saving in space, both of which cut production costs. High tiering of skid-loaded materials increases the available storage space as loads may be piled to the ceiling, yet there is easy access to products, particularly heavy or bulky units. Waste motion in handling is eliminated.

Streamlined industrial trucks transport and tier materials, re-

(Please turn to Page 37)

PRECISION AND SPEED

WITH

SOUTH BEND LATHES

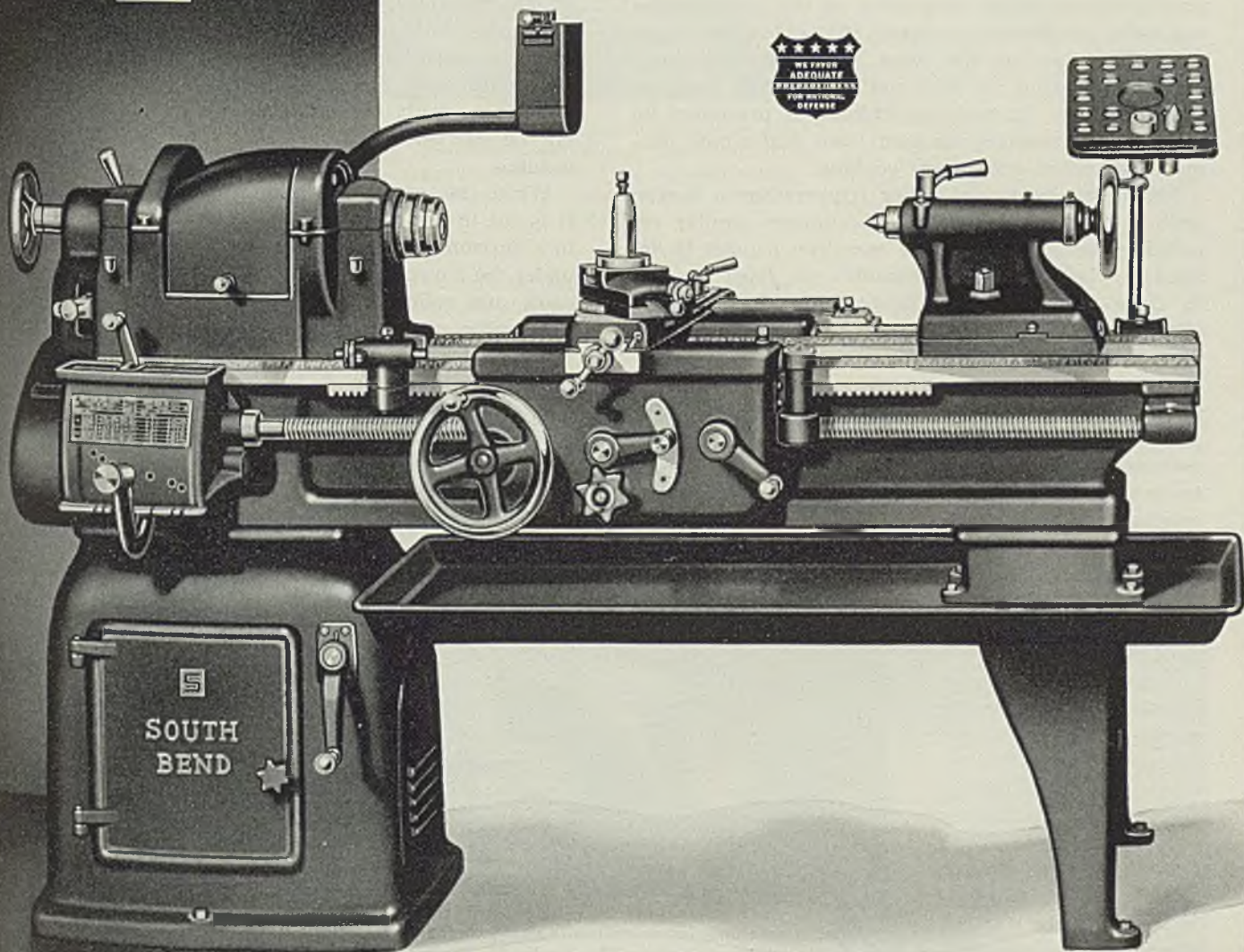


To make a profit, in these highly competitive times, machine operations must be performed quickly and accurately. High spindle speeds and extreme rigidity are essential for efficient machining with sintered carbide or diamond tipped tools, especially when finishing die castings, plastics and other fast cutting materials. Precision and speed are therefore important factors to consider when selecting a lathe.

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Features responsible for the excellent performance of South Bend Lathes include an alloy steel spindle with hardened and superfinished bearing surfaces, a one-piece double wall apron with steel gears running in oil, a powerful worm drive and multiple disc friction clutch for operating the power carriage feeds, and a direct belt drive to the spindle.

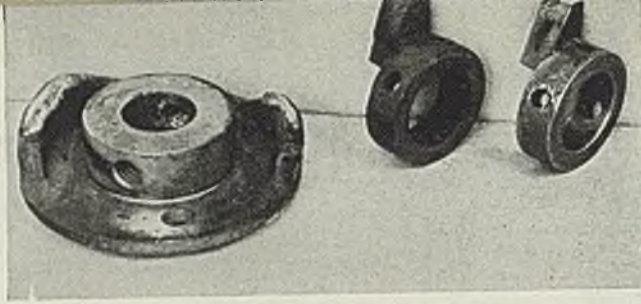
South Bend Lathes are manufactured in five sizes, 9" to 16" swing. If you are considering the installation of a lathe, write for our new catalog describing the New Series "S" South Bend Lathe.



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The rebuilt cast iron cam at left and roller tripper at center are ready for machining. A worn tripper is shown at right

Rebuilding Worn Cast Iron Surfaces

■ IN THE rebuilding of gray cast iron parts, soft machinable welds are readily obtainable by careful procedure and attention to detail. Hard spots within the rebuilt areas must be avoided. This means that the operator must weld carefully and take into consideration a number of factors which, if not properly controlled, will result in an unsatisfactory deposit of cast iron over the rebuilt area.

Hard welds or hard spots are caused by the presence of small pieces of oxide, by cooling of the weld puddle due to sudden immersion of the cold welding rod, or by careless manipulation of the blowpipe which allows portions of the weld to solidify suddenly. Proper preheating of both rod and casting helps to avoid chilling. In addition, chilling is prevented by thoroughly protecting the part from drafts both during welding and subsequent cooling.

Rebuilding cams and roller trippers for a button drilling machine is typical of countless similar rebuilding operations where a cast iron deposit is desired to be readily machinable yet hard enough to have good wearing properties. Due to the abrasive action of dust resulting from the drilling operations, these parts usually wear out in about a year. Rebuilding the cams becomes necessary when wear extends $\frac{1}{8}$ -inch below the original contacting surfaces. Roller trippers are permitted to wear as much as $\frac{1}{4}$ -inch before they are reclaimed by welding.

Since the machine on which these parts are used is of foreign design, it is estimated that it would take months to obtain new parts, if they could be obtained at all. Use of the oxyacetylene process, however, greatly simplifies the work of the plant maintenance operator because the

parts can be rebuilt over and over again. Those shown in the accompanying illustrations were photographed while being reclaimed for the seventh time.

First step in the cast iron rebuilding operation is the careful cleaning of the areas to be rebuilt. Small parts are usually ground or chipped to clean metal with a hammer and cold chisel. Heavy sections may be prepared with the cutting blowpipe or pneumatic chipping hammer. Any traces of scale, cutting slag, rust, grease or dirt which then remain are removed by emery wheel, sand blast or wire brush. Since impurities will cause porous spots and blowholes in the weld, cleaning must be thorough and should extend sufficiently beyond the edges of the area which is to be rebuilt so that undesirable materials will not be carried over into the molten puddle during welding.

When the gray iron part is thoroughly cleaned, it is set in position so that the welding can be done in a horizontal plane and the entire casting is heated under the blowpipe flame to a dull red. For the small cams and roller trippers shown, the operator uses a blowpipe equipped with a No. 4 tip; large castings

usually require the use of a preheating furnace. The neutral flame is then directed over the area to be rebuilt. As the base metal begins to melt, a surface skin of oxide is formed which must be broken to obtain proper fusion. This is accomplished by stirring the molten puddle with the end of the $\frac{3}{16}$ or $\frac{1}{4}$ -inch diameter cast iron welding rod, and by using flux.

To assure thorough fusion, the operator also welds slowly, applying only sufficient heat to make the cast iron flow readily. Rapid welding and overheating of the metal are avoided be-



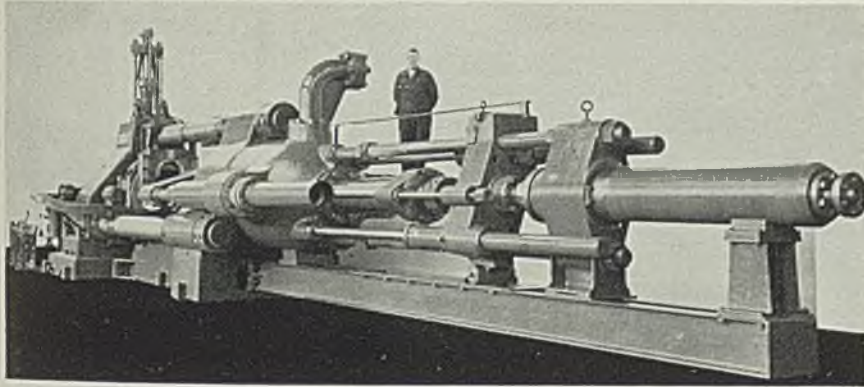
This worn cam is being rebuilt with cast iron for the seventh time. Illustrations courtesy The Linde Air Products Co., 30 East Forty-second street, New York

cause both these factors tend to increase the amount of undesirable gas bubbles and oxide inclusions in the weld. All included pieces of oxide appear in the molten metal as white specks or brightly glowing globules about the size of a pinhead. These are carefully and systematically worked to the surface and then to the edge of the puddle with the blowpipe flame, but the tip of the inner cone is at no time allowed to touch the surface of the puddle. They are then skimmed out with the fluxed end of the welding rod.

When all oxide inclusions have been removed and the puddle surface appears clean, weld metal is added to build up the surface. The end of the rod is heated in outer

edge of the flame, dipped into the flux, and then melted in the puddle. Chilling of the metal, which results in undesirable hardness, is avoided by heating the rod to a temperature just below its melting point before introducing it into the puddle.

When the part has been rebuilt to size, the surface is reheated slightly to smooth it out. Any impurities which appear during this operation are removed as previously described. Then the part is carefully protected from drafts with a covering of asbestos paper and allowed to cool slowly. To test the rebuilt area for machinability, the operator uses an ordinary file. If the deposited metal files easily, it indicates a good job.



Press Extrudes Ferrous, Nonferrous Tubing

■ All of the currently known stainless steels and other special ferrous and nonferrous alloys, which do not work well by rolling, welding or piercing, can be extruded without difficulty by means of a new 2000-ton capacity press announced by Farrel-Birmingham Co. Inc., Ansonia, Conn. With it aluminum alloys are extruded in numerous semi-finished shapes which are more readily worked into final dimensions.

Billets to be extruded can be taken as rough cast billets coming from the foundry after being cut to the proper length. The skin of the billets, formed mostly by oxidation, remains as a thin shell in the container after extrusion, so the extruded product is formed of clean material only.

Tubes and rods manufactured by the unit shown above are not only sound in structure but possess good metallurgical and physical properties and good surface conditions. Consequently the number of draws for finishing can be reduced considerably.

The amount of scrap—consisting of the thin shell of the billet and the discard—is low, so the difference in weight of the billets charged into the container and of the extruded

Tubes and rods manufactured by the extrusion press shown in the accompanying illustration are not only sound in structure but possess good physical properties

product is only about 8 to 10 per cent in the case of tubes and about 10 to 12 per cent when manufacturing rods. The concentricity of the extruded tubes is well within the commercial limits, and it will be within plus or minus 5 per cent of the wall thickness. These units are available in several capacities.

Telescope Detects Defects in Gun Barrels

■ A bore inspection telescope which provides a clear and detailed view of the inner walls of gun barrels, tubing, pipes, boiler tubes, and other inaccessible recesses is announced by Gaertner Scientific Corp., 1201 Wrightwood avenue, Chicago. It detects small holes, cracks, pits, scratches and other defects and inspection can be made in tubes 1 to 4 inches in diameter and, by means of extensions, to a depth of 20½ feet.

The main unit of the telescope permits inspection of tubing to a depth of 4½ feet. It consists of an illuminating head, a telescope tube containing the necessary optics, and

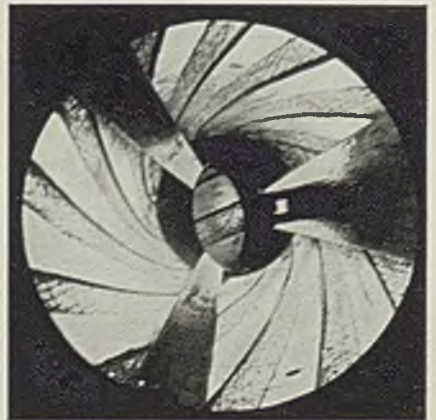
a removable eyepiece. Extension tubes, each 4 feet long, and containing the necessary optics can be added to the main unit to increase correspondingly the depth of inspection. As many as four of these tubes can be added.

The method of connecting the extensions ensure a rigid tube. The illuminating head carries a special tubular lamp the clear portion of which is 6 inches long. It is provided with an adjustable inclined mirror, which enables the observer not only to look along the inner walls of the bore, but also to obtain a direct view at right angles to the wall as shown by the accompanying illustration. The image of the wall formed by the mirror appears in the center of the field of view. The view is such as would be seen were it possible to place the eye within 2 to 8 inches of the point being inspected.

The telescope is simple to use. The observer merely lowers it into the bore to be inspected. The inside walls at the corresponding depth are continuously visible in the eyepiece. When the instrument has been lowered to the full length of the main unit, and if inspection to a greater depth is required, it is necessary only to remove the eyepiece and insert in its place an extension tube, placing the eyepiece in the upper end of the extension tube instead of in the main unit. If the eyepiece supplied with the main unit is used, the image is inverted (as in an ordinary microscope) whenever an odd number of extension tubes is employed. In most cases, this is of no more importance than it is in the case of a microscope, but for those who wish the image always to have the same orientation, a special eyepiece is available.

The instrument, designated as M2125, is of stainless steel tubing, specially straightened. It is supplied with three spare lamps, 25 feet of lamp cord, 6-volt transformer and a wooden case accommodating all extension tubes.

Field of bore inspection telescope



Scarfig Billets

(Concluded from Page 64)

of copper bearing steel with welded joints. A 2-inch line of the same type is used for acetylene. Both lines are laid in a wooden box, completely imbedded in pitch, and the box is buried in a trench 6 feet deep, to prevent any damage from heavy rolling equipment or dropped crane loads. At a point where the trench passes under the acid line to the pickling tanks both pipes are enclosed in a welded sheath of lead, as an extra precaution.

Throughout the entire installation the oxygen pipe lines are painted green, the acetylene lines red.

Sixteen outlets for the torches are provided at the scarfing beds, four at each sidewall, and eight at the center. These are arranged in steel boxes buried to ground level to protect them from damage by moving or falling crane lifts. Holes cut in the covers of the boxes provide adequate ventilation to prevent accumulation of gases in case of leaks. The pipes in the boxes are covered with sand to protect them against sparks which may fly through the openings in the covers.

Once every day all joints and valves throughout the entire system are tested for leaks with soap solution. Branch pipes extending through the roof of the building and sealed with burn-out disks are provided at the entrance and at the extreme end of the building.

Scarfig Slabs

Two scarfing beds, one at each end of the storage building, are used for conditioning the slabs in the continuous sheet and strip mill. The beds are equipped with 8 x 8-inch and 14 x 9-inch skids. The scarfer walks on top of the slabs using a 4-foot torch, equipped with 3/16-inch starting rod and a standard tip, which is one size larger than that used in scarfing billets.

As the slabs are brought to the storage building they are loaded and placed on the scarfing beds in crane lifts. First, all inspection and scarfing of the edges are completed, and the slabs are laid out on the beds with a 10-ton gantry crane and magnet. After one side has been cleaned, scarfed, and inspected the slabs are turned over with the magnet and the other side completed. The conditioned slabs then are placed in storage or taken to the heating furnaces.

A scarfing crew consists of two scarfers, two cleaners, one inspector, one crane operator, one gantry operator, and two crane helpers. Depending upon the condition of the

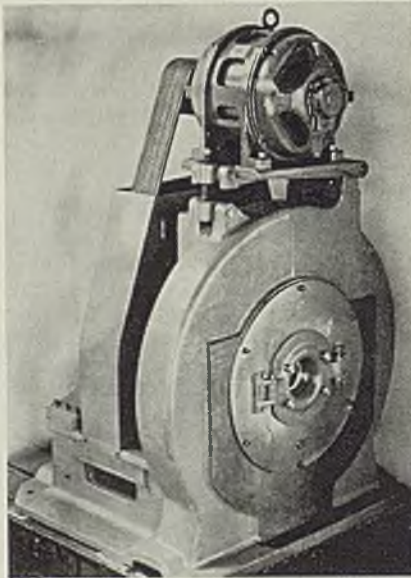
slabs such a crew will scarf 1000 to 1500 tons per 8-hour shift, using about 20 cubic feet of oxygen and 0.4 pound of carbide per ton.

Oxygen is received in trailers and reduced to a line pressure of 100 to 110 pounds. Acetylene is made at the plant, in three generators, and delivered to the scarfing beds at 6 to 8 pounds pressure. All-welded copper bearing pipe is used throughout, 2-inch pipe for oxygen and 1 1/2-inch pipe for acetylene. The acetylene line is equipped with a number of water seals and burn-out disks to prevent flash-backs to the generators.

New Machine Bands Shells by Swaging

■ Shells now are being banded satisfactorily in a new machine developed by Standard Machinery Co., Providence, R. I. Shown in the accompanying illustration, it is an adaptation of the rotary swager which this company has manufactured for many years. Following firing tests this method of banding has been approved.

Tests at the Frankford arsenal,



One of these machines now in use bands 37-millimeter shells at the rate of six pieces per minute

Philadelphia, of bands taken from the shells after swaging revealed the tensile strength of the gilder's metal to average 37,000 pounds per square inch as compared with the 35,000 pounds per square inch required. Percentage of elongation ranged between 37 and 43 per cent as against allowable minimum of 15 per cent. These figures are important in showing that the swag-

ing operation does not cause brittleness that might lead to breakage of the band in firing.

The feeding fixture of the machine contains an adjustable device for locating the copper band in its proper position over the shell groove. The shell is centered by the use of a mandrel in the powder cavity. Output is rapid; one machine now in use is banding 37-millimeter shells at the rate of six pieces per minute. After completion of the swaging operation the shell is stripped from the mandrel automatically.

Less banding metal is required when the swaging method is employed. This is because swaging leaves a smooth surface and hence does not require excess stock for later removal in finish turning. Resultant savings of gilder's metal, depending on size of the shell, ranges from 16 to 20 per cent.

Shells ranging from the 1.1-inch to the 155-millimeter size may be banded on the new swagers and feeds.

Armco Plans Spanish Engineering Dictionary

■ Engineering students in Central and South America are participating in a contest to encourage closer technical relations through development of a more standardized vocabulary of engineering terms in Spanish and English. Contest is sponsored by the International Corp. of American Rolling Mill Co., Middletown, O.

Confusion currently attendant upon marked variations in interpretation of the same engineering term in different parts of the Spanish-speaking Western Hemisphere was responsible. For example, the word generally accepted for back-fill as related to excavation and back-fill work is in a few countries interpreted to mean stuffing for roast fowl.

Known as the E. A. Emerson Engineering Award for 1940, the contest provides a \$100 prize to the student in each accredited Central and South American university who submits the best report on Spanish terminology, metric tables and formulae used in a drainage handbook published by Armco International Corp.

The winning papers will be eligible to participate in the grand award, with \$1000 prize.

From those papers words and terms acceptable in the maximum number of South American countries will be determined. Similar contests will be conducted later in other engineering fields and a composite acceptable Spanish-American dictionary of engineering terms will be developed.

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RODS COULDN'T HANDLE"



NOW, more than ever before, the General Electric line of rods is ready to answer every deposition problem of speedy, dependable welding.

Approved by every major board of authority, our complete line provides a long-awaited source of supply for electrodes to handle ALL major work classifications.

From an operator's viewpoint, G-E heavily coated electrodes are mighty easy to use — special flux coatings help assure

high-quality welds, with fewer rejects and less re-working. Gas escape is speedy and complete, allowing clean welds and easy removal of slag blanket and spatter.

G-E heavily coated electrodes produce sufficient "cupping effect" on the electrode to direct the arc to the working area in a sharp, highly concentrated manner that gives complete control and ease of working. You can do more work per day when your electrodes handle easily, work fast, and give ample penetration deep into each joint.

GENERAL  **ELECTRIC**
673-12

Announces Course in Oxyacetylene Welding

■ A comprehensive course of classroom exercises and lectures covering oxyacetylene welding and cutting processes is reported by Air Reduction Sales Co., 60 East Forty-second street, New York. It consists of two separate books — one containing a complete set of work sheets—the other lecture material to be used as a supplement to the first.

The book of classroom exercises embodies the fundamentals for those interested in gaining a working knowledge of the art. Its 22 chapters describe the practice of both oxyacetylene welding and cutting.

The course of lectures describes the history of the art, the proper-

ties of its materials, its theories and its practical applications in industry. The book tends to broaden the application of the manipulative skill of the reader. The book containing the exercises sells for 50 cents per copy—lecture books are \$1 each.

Study of Strategic Mineral Supplies

■ *Strategic Mineral Supplies*, by G. A. Roush; cloth, 485 pages, 6 x 9 inches; published by McGraw-Hill Book Co., New York; price \$5.

The body of this work is based on a series of articles appearing in *The Military Engineer*, a series for which the Toulmin medal for 1938 was awarded by the Society of American Military Engineers. The various chapters have been revised and brought up to date, each being

submitted to specialists in the several fields, to eliminate technical errors.

It presents a concise picture, from both a military and general industrial viewpoint, of the status of the United States with respect to strategic military supplies, those materials of mineral origin of which the domestic supply is inadequate to meet demand. Each of the 12 minerals is discussed in detail as to uses, substitutes, ore reserves, sources of supply, both domestic and foreign, imports, exports, stocks, tariff and political and commercial control, as they affect the domestic situation.

Importance of this work is enhanced by the world situation of wars and disruption of commercial interchange, and the possibility of the United States being drawn into the struggle.

Down-Draft Exhaust Aids Finishing Department

■ AMONG the modern equipment installed in the recent new addition to the plant of the Landis Tool Co., Waynesboro, Pa., is a water-wash down-draft exhaust system in the finishing department.

The accompanying illustration portrays quite clearly most of its many advantages over older types of exhaust systems. The spray operation takes place over a gridded opening in the floor and powerful suction created by fans in the exhaust ducts below the floor carry the spray vapors down through the floor grating. This exhausted air then is cleaned by the water wash method which prevents the discharge of heavy solid paint residues.

This type of exhaust was developed especially for use in connection with spray painting heavy products such as the machines produced by Landis Tool. Production of machine tools most certainly is not continuous as it takes a long

time to build machines which can be spray finished in a few minutes. So the finishing station is not in constant use. Were it the enclosed type of spray booth, it would take up valuable floor space when not in use.

The downdraft system, however, frees this space for other operations when it is not being used for spraying.

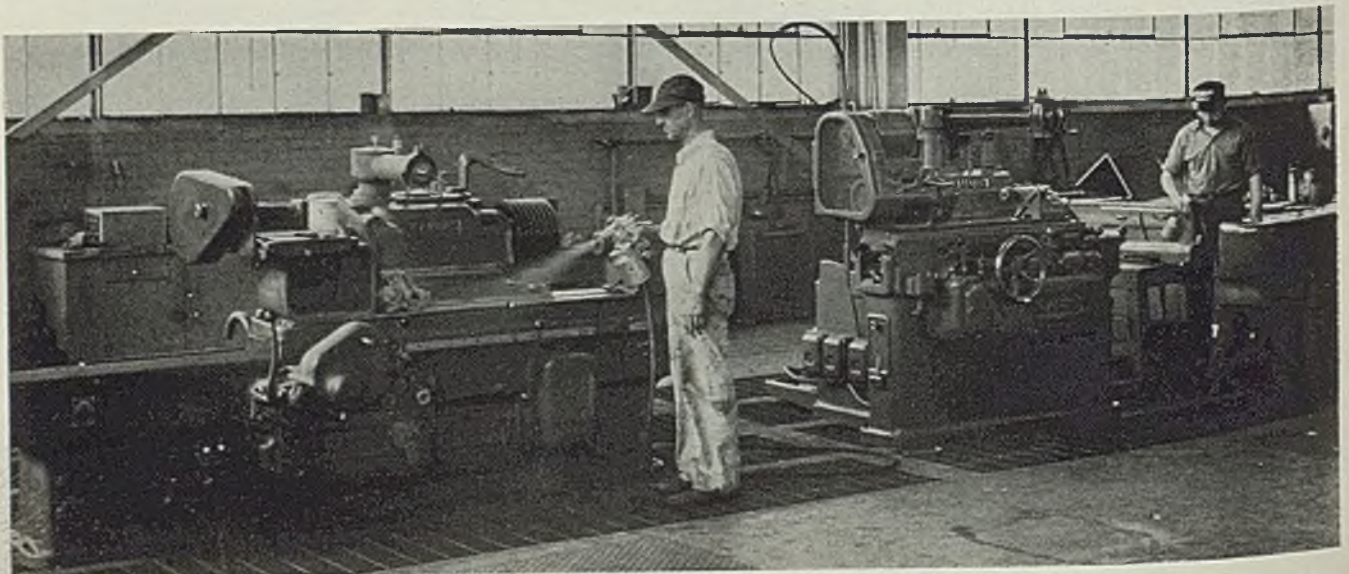
Then too, grinding and other dust and vapor producing operations can be brought to this location. Throwing an electric switch is all that is needed to put the exhaust system in operation. After painting is completed, the machine is moved to its next station and the area is again free for any purpose desired.

The Landis installation consists of two separate units which may be operated singly or together. Each unit has a grating covered spraying area 9 x 12 feet. The units are separated by the concrete water pit and metal eliminator

packs which are covered with airtight ¼-inch deck plating. The system is operated by a 5-horsepower water pump and two 42-inch fans, each belt-driven by a 5-horsepower motor.

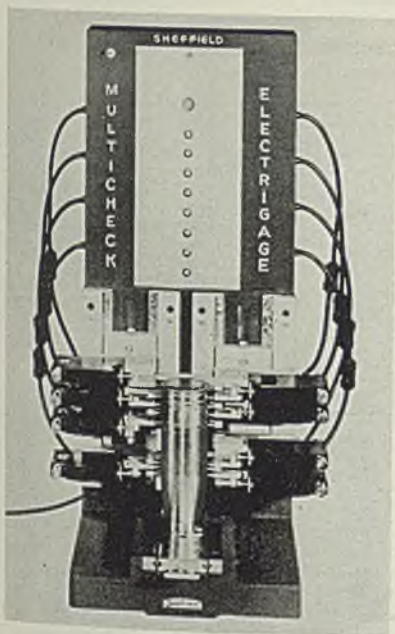
Because of the great variety of shapes and sizes of machines painted, they are conveyed from one position to another by means of an overhead crane. This is the manner in which they are transported to the exhaust for the spraying operation and accounts for the absence of track or rail from the floor grating.

Production advantages such as speed, convenience of operation and savings of floor space were not the only reasons for this installation. The desire for clean, healthful working conditions and the safety and comfort of employes were factors which forced their decision. The system was designed, built and installation supervised by the De Vilbiss Co., Toledo, O.



Multicheck Electrigrage

Sheffield Gage Corp., Dayton, O., announces a Multicheck Electrigrage for the rapid inspection of mass production parts having several critical dimensions. At present it is being widely used for the inspection of timing fuse elements, shell bodies, cartridge cases and miscellaneous army ordnance work. Measurements of length, diameter and depth are flashed simultaneously on a control board by means of colored signal lights as the part being inspected is placed in gaging position. An individual gaging head is incorporated for each dimension to be checked and each head actuates a signal light. In addition to the individual signal lights (one for each measurement) this gage has a master signal light which integrates all measurements. When the master signal shows white, all dimensions are within tolerance. One light lens only is necessary for each dimension, and the several lenses are usually placed in a

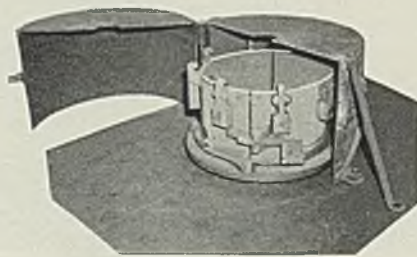


straight line above or alongside each other. A plan of the work part is shown, and this plan indicates each dimension with its own signal light. The patented Sheffield Reed mechanism is the heart of each electrigrage head used in the assembly of the Multicheck gage. It employs no gears, knife edges or levers and there are no rubbing contacts in its operation. It is claimed by one user that one operator can check seven dimensions on a 75 millimeter shell at the rate of 600 per hour without eye strain. These instruments can be used on parts as large as desired and are being used on minute parts such as a pinion less than 1/4-inch long overall and less than 3/32-inch in diameter. Each instrument is so de-

signed that it can be applied in innumerable combinations. It is a self-contained unit and if at any time the line of work upon which it is used changes, it can be dismounted and applied elsewhere.

Casting Machine

Centrifugal Casting Machine Co., Box 947, Tulsa, Okla., announces a model A vertical centrifugal casting machine for spinning both dry and green sand molds up to 25 inches in diameter and 20 inches in height. It has complete, flexible speed control from 0 to 1700 revolu-



tions per minute and may be operated from any alternating current source. The machine also features an integral electrical brake having no wearing parts. A complete panel board is provided which incorporates a tachometer to read speed, a control for adjusting the speed, a "run-coast-brake" switch and a push button for starting. Antifriction bearings are used throughout the machine.

Lamp-Shielding Louver

Benjamin Electric Mfg. Co., Des Plaines, Ill., has introduced a new lamp-shielding louver for its "Stream-Liter" fluorescent fixtures. It may be attached instantly, and increases the shielding angle to approximately 23 degrees in all directions. The louvers are of steel, designed in the so-called "egg



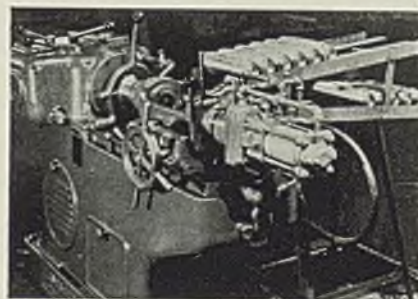
crate" construction and finished in special high reflection white enamel. They are welded into a rigid assembly at each interlocking point and the entire unit is welded to a rectangular frame rail which fits into the bead of the reflectors. Two spring clamps on each side rail



snap over the reflector bead to secure the louvers in position.

Shell Tapper

Landis Machine Co., Waynesboro, Pa., announces a No. 1 1/2 R shell tapper for tapping the nose end of shells in sizes from 75 to 155 millimeter inclusive. The illustration shows the tapper arranged for the 75 millimeter shell although the special arrangement which is now available permits handling sizes mentioned above. The special car-



riage or holding device with which the machine is equipped comprises a work supporting cradle, hardened and ground bushing which supports the nose of the work and a female center which supports the base of the work. The latter is in alignment with the center of rotation of the machine spindle. Movement of the center is actuated by an air cylinder mounted at the rear of the carriage and is controlled by a lever. In operation, the center is employed to push the work forward until it sets firmly in the ground bushing supporting the nose end. This effects a locking action which holds the work rigidly in alignment for tapping operation. Both female center and air cylinder are adjustable for shells of various lengths. The spindle of the shell tapper is equipped with a collapsible tap designed especially for this work. The design of the tap provides for internal ducts through which the cutting coolant is conveyed directly

to the cutting edges of the chasers. A special feature of this tap is the tripping collar which also functions as a pilot to assure the maintenance of unusually close tolerance specifications for alignment of the thread with the body of the work. The collar has a running fit within a pilot bushing which is located at the front of the machine carriage adjacent to the bushing previously mentioned and supporting the nose of the work. In operation, the collapsing action of the tap is actuated by the tripping collar striking the end of the work. Production of this machine is estimated to average 90 to 114 shells per hour based on an operating efficiency of 100 per cent.

Precision Lathe

■ Hardinge Brothers Inc., Elmira, N. Y., has placed on the market a high speed precision lathe to fit into the present production programs, from batteries in tool rooms and production departments to one or more machines in experimental and laboratory departments. It incorporates an enclosed head with pre-loaded ball bearing spindle construction; electrical driving unit with multispeed motor; convenient lever speed control at the headstock and



welded, all-steel pedestal. The bed of the machine rests on three spheres giving 3-point suspension to guard against any distortion which may come from an uneven floor. The bearings in the headstock are enclosed in an inner chamber. The rear of the spindle carries a double V-pulley for two endless belts from the driving unit. These may be applied or removed without removing the headstock spindle or bearings. A hand wheel manipulates the spindle when setting up, making tests or when finishing a thread by hand. Adjustable dials are plainly marked and graduated in thousandths. Two levers at the headstock end control low-stop-high and forward-brake stop-reverse spin-

dle speeds through the operation of electrical motor controls which are located to the left of the pedestal and enclosed by a cover. A metal chart, at the front of the machine shows speeds obtainable from the driving unit—eight forward and eight reverse speeds ranging from 230 to 3900 revolutions per minute.

Lift Trucks

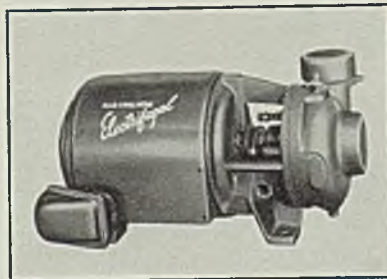
■ Barrett-Cravens Co., 3250 West Thirtieth street, Chicago, has placed on the market a new ball bearing lift truck capable of handling loads



up to 1000 pounds. It can be used with or without skids due to the incorporation of a sheet metal deck on the upper frame. The truck is made in platform heights of 3½, 6, 7 and 9 inches. It is available in one width only—18 inches, with a full 2-inch lift.

All-In-One Pump

■ Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces its new all-in-one Electrifugal pump designed as a complete pump and motor unit on one shaft and housing. It is equipped with a special motor held by a one piece cast-iron motor yoke and pump bracket. The feet are integral with the housing and bracket and extend under the entire

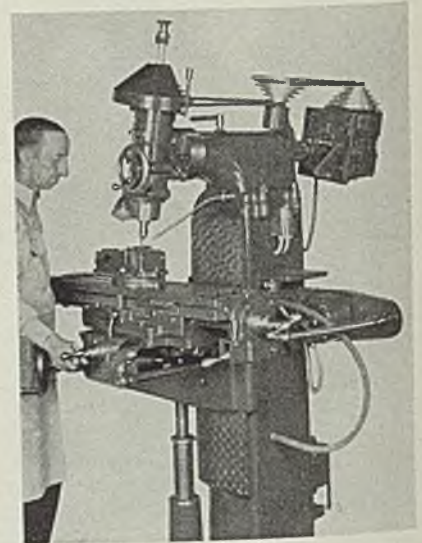


unit. In splash-proof construction this pump is available in sizes from 1 to 10 horsepower inclusive at 3500 revolutions per minute, and from ¼ to 7½ horsepower inclusive at 1750 revolutions for heads up to 160 feet. For normal service, it is built with cast-iron casing,

bronze fitted. It can, however, be made all iron, all bronze, all stainless steel, or of other special metals to suit any industry.

Vertical Milling Machine

■ Midway Machine Co., 2324 University avenue, St. Paul, Minn., announces important changes in its No. 2½ Millmaster vertical milling machine (STEEL, Aug. 19, 1940, p. 74). The deluxe models now include a center or third pulley attachment and a table power feed attachment as standard equipment at no extra cost. These, however, are available on standard models, or sold separately. The table power feed unit furnishes power feed to the table on longitudinal travel only. It uses a ¼-horsepower 3-phase motor and provides seven speeds with stop-start-reverse. In addition, all models, standard and deluxe, now are furnished standard equipped with motor-driven pump and storage tank for coolants or cutting compounds. This unit is installed in the base of the machine and furnishes a constant supply of compound direct to the work. Gravity drain re-



turns the liquid back to the tank eliminating all waste. Other equipment now available for these milling machines include an indexing headstock and tailstock for all models; vernier attachments for high precision work; and special endmill holders for heavy duty milling. The latter are optional in place of collets. The length of the working table has been increased from 26 to 38 inches, and the weight of the machine has been increased from 1600 pounds to 1800 pounds, net.

Direct-Current Motors

■ General Electric Co., Schenectady, N. Y., has placed on the market a new line of direct-current motors featuring compact design and im-

proved protection. A new rolled-steel frame and improvements in end-shield and bearing-bracket construction protect the new motors from external damage.

Formex wire coils and a specially developed Blyptal insulating varnish provide high resistance to impact, abrasion and the action of foreign materials. The motors can be furnished with sleeve or ball bearings. Open motors are available in constant-speed ratings from ½-horsepower at 850 revolutions per minute up to and including 60 horsepower at 1750 revolutions per minute; and, in adjustable-speed ratings from ½-horsepower at 850/3400 revolutions per minute up to and including 15 horsepower at 500/1800 revolutions per minute. Motors in larger ratings embody additional design innovations such as a new system of self-ventilation, extra protection of all current-carrying and rotating parts and large conduit boxes. New V-type double-brushholders give better commutation and permit rotation in either direction.

Other features common to the entire line include lower WR²; small diameter; reversal without changing any parts of the frame, fan, or brush rigging; and Textolite wedges in the armature slots to protect windings.

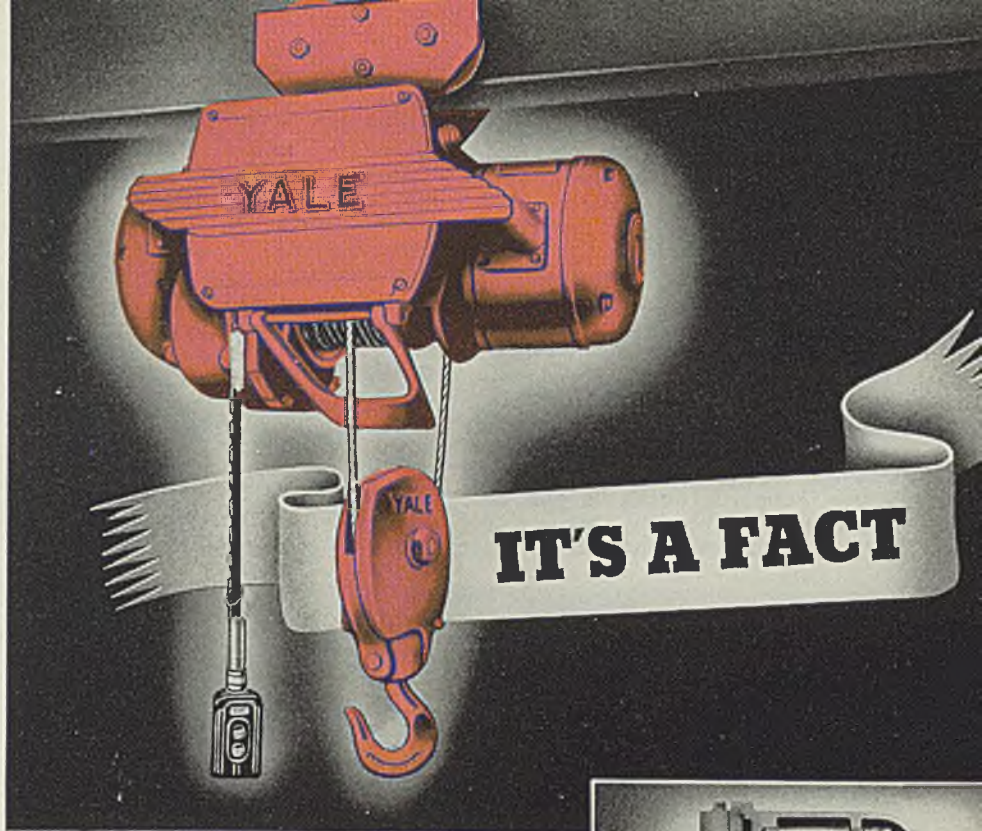
Sectionalized Motor Control Cabinet

■ Cutler-Hammer Inc., 315 North Twelfth street, Milwaukee, announces the Unitrol, a device which



is built on the same principle as today's sectional filing cabinets, and which permits all types of control devices to be organized in locker-like motor control centers. Its standardized construction allows build-

November 11, 1940



THE CABLE KING HOIST BRINGS YOU ALL THESE FEATURES:

- | | |
|------------------------------|--------------------------------|
| 1. Air-cooling | 8. One point lubrication |
| 2. Lifetime gearing | 9. Large diameter drum |
| 3. "Precision" type bearings | 10. Upper limit stop |
| 4. Self-adjusting load brake | 11. Safety bottom block & hook |
| 5. Heavy duty motor brake | 12. All-weather controllers |
| 6. Weather-proof motor | 13. Ribbed steel hoist frame |
| 7. 30 Minute motor rating | |

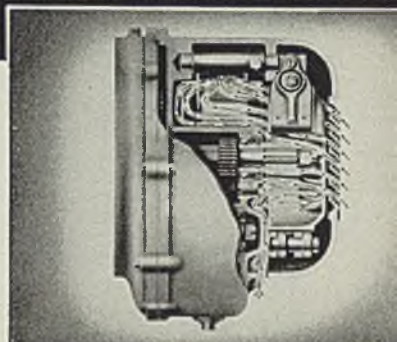
These features make the Cable King the electric hoist that meets *all* specifications engineers demand. A proved hoist . . . it's proved by exhaustive laboratory and field tests.

Air-cooling, an exclusive Cable King feature, eliminates excess brake heat, and enables the Cable King to operate on a heavier duty cycle than any other hoist in the same class. It accomplishes more in a given operating hour, which means greater savings.

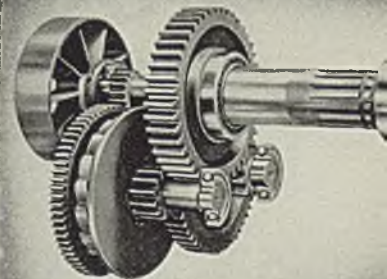
Another Cable King feature is Yale precision construction. All gears and pinions are drop-forged, chrome nickel steel, heat treated for maximum wear and long life. And the bearings at *all* friction points are "precision" ball or roller type, specially sheathed and shielded from dust.

These are only a few of Cable King's exclusive features. Ask your Yale distributor to tell you about *all* of them. Or write direct to us for descriptive catalog.

Capacity ¼ to 6 tons.



AIR-COOLING



LIFETIME GEARING



PRECISION TYPE BEARING

THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
IN CANADA: ST. CATHARINES, ONT.



ing up to any control center as the units are mounted in standardized cubicle sections. These are made in 32 sizes; eight widths, four heights (one depth) for mounting any desired combination of units. They can accommodate controllers, disconnect switches and accessories as required. Control devices can be mounted in both front and rear of the section giving double sided construction and the sections may be installed in a straight line, L-shape or in a U-shape. The units are assembled either with all wiring busses, supports, terminals and interconnections already made, or with provisions for wiring it on the

job. Blank steel panels are furnished for unused sections. Push-buttons, meters and other accessories may be mounted on the blank panels. A door swing-out feature facilitates wiring and changeovers.

Air-Cooled Transformer

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has introduced air-cooled ASL transformers providing a higher factor of operating safety. With 60-cycle ratings ranging from 150 to 500 kilovolt-amperes inclusive for single phase, and 150 to 1000 kilovolt-amperes inclu-

sive for 3 phase, voltages 13,200 volts and below, these transformers may be located near the load center, permitting short secondary cable runs.

The housing is constructed of expanded metal finished in black baked-on moisture proof enamel. The primary and secondary coils are separated by air spaces through which a stream of air constantly circulates. The windings are designed for a 75-degree Cent. temperature rise under continuous full load operation. Heat resisting insulation is used throughout.

Bottle Oiler

■ Trico Fuse Mfg. Co., 2948 North Fifth street, Milwaukee, has introduced a new, visible, unbreakable bottle oiler for lubricating automatically solid, wick or waste-packed bearings. It discharges a few drops of oil at the slightest temperature rise and as soon as the bearing receives this oil, it cools and stops feeding the oil automatically. The oiler also features an adjustable



BROOKVILLE LOCOMOTIVES

When selecting a locomotive the Rustless Iron & Steel Corporation stressed a number of extremely important features, including:

**ABSOLUTE RELIABILITY — AFTER SALES SERVICE
ECONOMY IN OPERATION AND UPKEEP**

The Brookville BMD 3 1/2-Ton selected offers all of these, and more.

Reliability—Design and material proven out by hundreds of installations involving all kinds of operating conditions. This includes the P-12 or U-2 International engine.

After Sales Service—On this, Brookville has built up an enviable reputation over a period of more than 20 years. Approximately 90% of all replacement parts orders are shipped the same day received.

Economy of Operation & Upkeep—It's the exception rather than the rule to receive even minor parts orders short of from one to two years after placing a Brookville under service. The P-12 or U-2 International engine carries a world wide reputation for economy in connection with fuel and oil.

Brookville Locomotives are furnished in all gauges and sizes suitable for handling the smallest industrial car up to standard railroad stock. With customers choice of Diesel or gasoline power.

BROOKVILLE LOCOMOTIVE CO.
BROOKVILLE, PA., U. S. A.



feed which regulates the oil flow. All metal parts of the unit are of solid brass, bright cadmium plated. It is available in 1, 2 and 4-ounce capacities.

Drilling Machine

■ Taylor Sales Co., 2330 West Clybourn street, Milwaukee, has placed on the market a new HI-EFF series B sensitive drilling machine for production drilling requirements to take care of needs to 1/2-inch di-



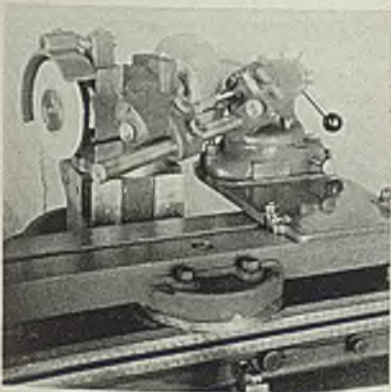
ameter. It is capable of drilling holes as small as 0.015-inch diameter. The unit features a V-belt drive

STEEL

assuring constant spindle speed at six different ranges. It is powered by a ¾-horsepower motor, either 110 or 220 volts, 3 phase, 1800 or 3600 revolutions per minute. Motor control includes across the line, overload and no load voltage protection, with start-stop station. It uses a 3-jaw, key type Jacobs clutch. The taper of the chuck is fitted to the drilling machine spindle. An interchangeable socket can be supplied to interchange with the spindle and No. 2 Morse taper. Chucks can be supplied with capacities of ¼, 5/16, ⅜, ½, or ⅝-inch.

Grinding Attachment

■ Covel Mfg. Co., Benton Harbor, Mich., announces a No. 2 tap grinding attachment which is capable of handling a wide variety of sizes and styles of taps. It may be



mounted on any grinding machine having a grinding wheel of 1¼-inch face or less. The attachment is quickly set up from one type or size of tap to another. Small taps, from 6 to ½-inch, are held in a 3-jaw chuck, while larger taps are held on centers during grinding operation. A female center also is provided for small taps. The spindle of the attachment is mounted on dust-protected ball bearings.

Gear Generator

■ Gleason Works, Rochester, N. Y., announces a No. 24 straight bevel gear generator for rough and finish-

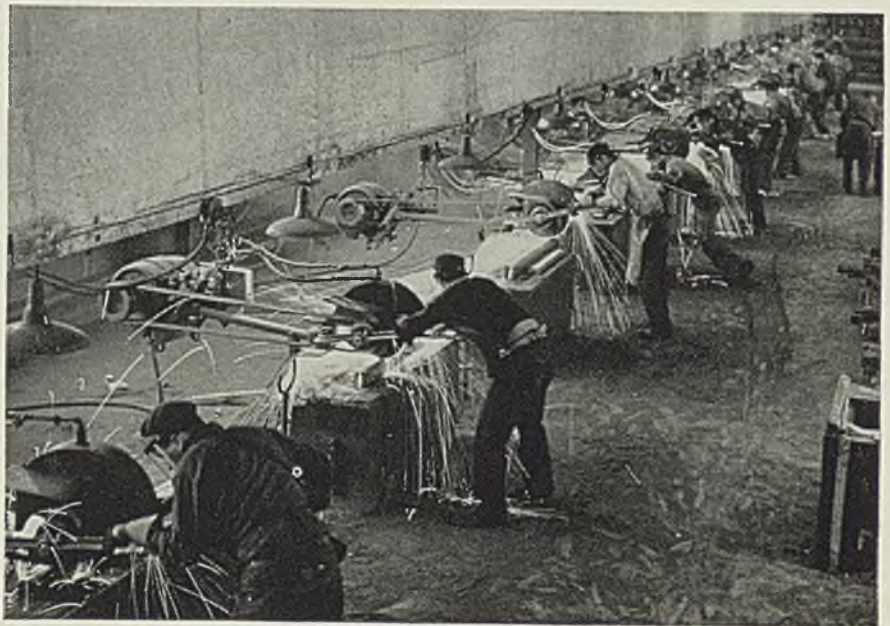


cutting teeth of straight bevel gears. It will handle straight bevel gears

up to 35½ inches diameter with pitches as coarse as 1½ diametral pitch. It is capable of cutting straight bevel gears of larger sizes about 30 to 50 per cent faster than before.

A new tool relieving mechanism and tool slides on the machine provide rigid tool support and permit higher stroke speeds. Both cradle reverse and index mechanisms are cushioned. The work head is secured to a large base which slides on a heavy one-piece frame. The feed for tooth depth and withdraw for indexing are applied to the sliding base through a cam and adjust-

able lever. The cam has a double track, one for rough-cutting and the other for finish cutting. A hydraulic movement provides rapid movement of the work head to and from the chucking position. The work spindle of the machine is bored 6 inches nominal diameter at the large end with ⅜-inch taper per foot. A new stock dividing gage accommodates all pitches within the machine range, and can be used for either even or odd numbers of teeth. The adjustments of feed and speed rate, index, ratio of roll and amount of roll are all obtained by change gears.



A Partial View of the FOX SWING FRAME GRINDER Installation at the New Plant of THE RUSTLESS IRON & STEEL CORP.

We are very proud to have served RUSTLESS for many years.

Send for our catalog describing and illustrating our complete line of Swing Frame and Stand Grinders ranging from 12" to 24" in Swing Frames and 24" and 30" in the Stands.

FOX GRINDERS, Inc.
Oliver Building Pittsburgh, Pa.

Standardization

(Concluded from Page 68)

tional costs alone often equal or exceed the selling prices. The customer is not at fault in this matter, not in the least. It simply represents a troublesome condition which in its broader aspects can be greatly ameliorated, although not entirely cured, by an application of the principles of standardization. This presupposes a co-operative approach on the part of both consumer and producer.

It is hardly possible that standardization of products could take

place without standardization of processes. That is exactly the case. The steel industry has been paying meticulous attention to its means and methods of production, all of the way from the selection of raw materials to the finishing operations on products prior to shipment. Suitable methods of chemical analysis, determination of physical properties, the setting up of rational tolerances for gage and shape, and the development of standards for surface finish are a few of the factors which now enter, significantly, into the control of operations. Pyrometry at all important points is doing

indispensable service. The application of the teachings of physical metallurgy to steelmaking as well as to the heat treatment of various grades of steel is systematizing the procedures and making for regularity and reproducibility in the product. All of this has been matched by the ingenious mechanical devices with which the steel mills have been equipped.

Much remains to be done. Experience has shown that any attained position is subject to change, particularly in an era of rapid technological advancement. Standardization, we repeat, must be dynamic enough to permit of improvement and progress.

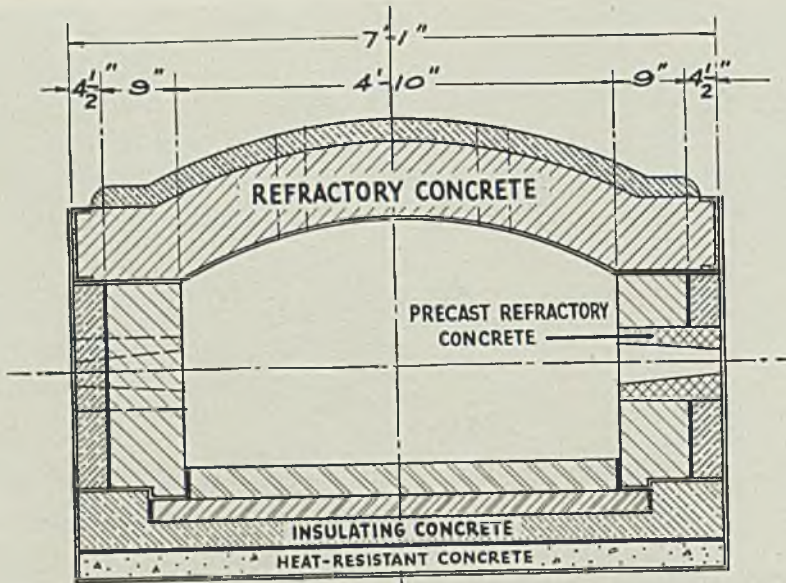
Information To Be Published

Further in the interest of rational standardization, the steel industry, through the American Iron and Steel Institute, is applying organized and conscientious efforts to the task of codifying the necessary underlying information. The technical committee of the institute, in collaboration with the manufacturing committee, is preparing a comprehensive manual which will (1) classify and define the products of the iron and steel industry, (2) collect and present data pertaining to manufacturing tolerances, (3) collect information relative to methods of inspection for each product, and (4) review existing specifications that might be considered appropriate as current standards in their respective classes.

Standardization is not an end in itself, it is fundamentally a contributor to the efficiency of industry. By serving to eliminate non-essentials it paves the way for rapid and economical production. In the present international competition for political and commercial position, a very narrow margin of superiority may be the factor which determines the swing of the balance. We in America are incorporating the principle of standardization into our industrial efforts so that when we are weighed in the national or international balance, we shall not be found wanting.

Bradley Announces Fixture Cleaner

■ A new cleaning agent, called Bradex, developed especially for stall showers, drinking fountains, etc., is announced by Bradley Wash-fountain Co., North Twenty-second and West Michigan streets, Milwaukee. It is economical, safe, easy to use, and highly effective. Its ingredients consist of a synthetic soapless detergent base, a siliceous abrasive, and alkaline agents, which intensify its emulsifying and dispersing action.



● Construction detail of Rivet-rod heating-furnace, showing use of Refractory, Insulating and Heat-Resistant Concrete.

How they built this furnace with 3 KINDS OF CONCRETE

The Dominion Bridge Co., Ltd., of Lachine, Quebec, did a complete job in this furnace with Refractory Concrete, Insulating Concrete and Heat-Resistant Concrete—all made with LUMNITE.

ADAPTABILITY to a variety of high temperature conditions led to the use of three kinds of LUMNITE concrete in building this rivet-rod heating furnace.

- ▶ Refractory Concrete construction eliminated joints, cut down air infiltration, thereby reducing scaling to a minimum and saving heat.
- ▶ Insulating Concrete back-up, sub-floor and roof cover further reduced heat loss and smoothed out temperature control.

▶ Heat-Resistant Concrete formed a level, monolithic bottom slab.

All three concretes—Refractory, Insulating and Heat-Resistant—were made with LUMNITE, a cold-setting, rapid-hardening binder. The desired refractory and insulating properties of each kind of concrete are determined by the type of aggregate. Cast-in-place Refractory Concrete and Insulating Concrete form the bottom, walls and roof arch. Burner ports are precast Refractory Concrete units.

For detailed information, write for booklet, "Refractory Concrete." Address Atlas LUMNITE Cement Co. (United States Steel Corporation Subsidiary), Dept. S-3 Chrysler Building, New York City.

LUMNITE FOR REFRACTORY CONCRETE

Modernizing Handling

(Concluded from Page 74)

claim and take them to shipping departments on original pallets without manual effort or excess use of space. In many storerooms and warehouses, aisles are cluttered with goods, a fire hazard and a "bottle-neck." Where modern lifting equipment is used, aisles are clear and often goods on pallets can be tiered right to the ceiling or roof trusses, every inch of space being utilized.

Another phase of production economy was reported by a user of tin plate who saves \$72 a car since equipping the plant to receive pallet loads. The tin plate supplier, able to save 10 cents on every base box of plate loaded on pallets, passes this saving on to customers using pallet trucks. There are 24 base boxes in a bundle, about 30 bundles in a car, which means a saving of 10 cents on 720 boxes or \$72 per car for those customers of this tin plate mill who have modern handling equipment.

Writes Off Truck Quickly

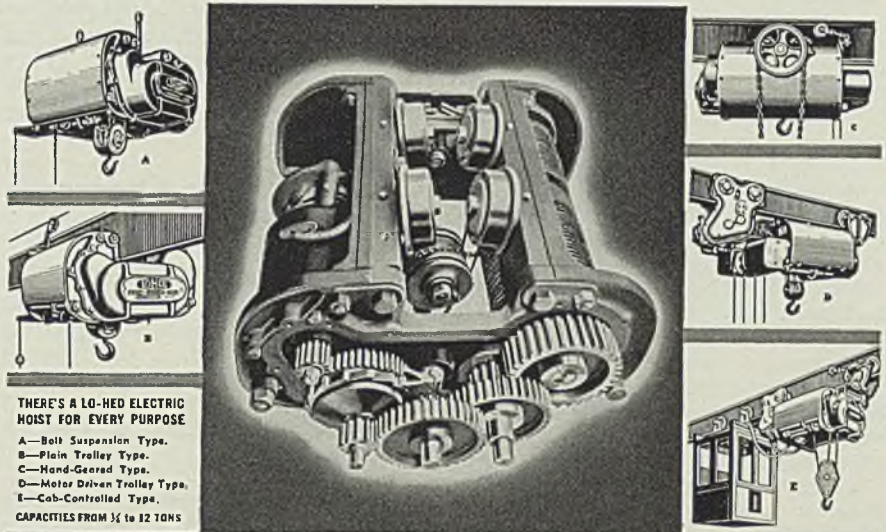
One plant invested in a power truck built low enough to enter a box car with a high-stacked load so that each haul laid down a floor-to-ceiling tier, no handling or stacking by hand. A saving of 35 per cent in loading time over the previous method used paid for the truck in seven months. In another plant, an elevating truck lifted a pallet load 16 feet high, putting it neatly into place in one-fourth the time taken previously with older equipment and hand work. High piling is made easy with pallets.

The pallet system, we find, is increasing in use in metalworking plants. The pallet, a light but strong inexpensive platform built to specifications to hold a number of "packages" of stated size and weight, accompanies the load in transit to facilitate handling at the receiving end, also to tier stack load, unload and transport throughout the plant on original pallets without manual effort. No straining, bending, lifting, nor fatiguing effort is involved. No afternoon lag to dampen output and increase production costs. Hence, faster and higher quality work is turned out at lower costs per unit with better satisfaction to customers and a more contented personnel—an intangible, probably, but it means much these days. Modern materials handling equipment coordinates fast automatic machinery and mass-production workers into a smoothly operating system.

One word of advice to those contemplating investing in industrial haulage. Do not do a patchwork

job or buy piecemeal. We saw numerous instances where the intraplant transportation system was not properly co-ordinated; where units had been added here and there to bolster weak spots but not done scientifically. Get the specialized knowledge of the industrial haulage engineer to help you remove the deadly "bottle-necks" of production, to solve your handling problems that are killing profits because of wasteful ineptitude. The materials handling routine must be planned the same as other elements of production. All requirements can be met with systematic planning.

Whether handling enameled parts through ovens; whether precision spotting heavy loads or weighing, counting or batching materials; whether loading or unloading boxes, bags, barrels, bales, coils of wire, steel sheets or tin plate in any quantity, size or weight, there is a systematic handling method that will minimize the time from point to point. That method requires the utilization of modern materials handling equipment, and this field research conducted specially for STEEL shows definitely that the modernization of industrial rolling stock will pay big dividends on the investment.



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Activities of Steel Users, Makers

■ **GENERAL ELECTRIC CO.**, Schenectady, N. Y., has booked an order for an 80,000-kilowatt turbine generator for the 465,000-kilowatt Charles R. Huntley steam station of Buffalo Niagara Electric Corp., near Tonawanda, N. Y., as part of an expansion for that station, involving a total expenditure of \$6,000,000.

Ward Leonard Electric Co., Mount Vernon, N. Y., has established a branch office in the Lincoln Alliance Bank building, Rochester, N. Y., with J. K. Savage, sales engineer, in charge.

Elgin National Watch Co., Elgin, Ill., has acquired buildings and land over a block square in area, valued at \$100,000, to house works for national defense orders.

Allis-Chalmers Mfg. Co., Milwaukee, will raze the last portion of its old Reliance plant in that city to clean up the property for possible resale. The plant, long abandoned, has been used only for storage.

Hammond Machinery Builders Inc., Kalamazoo, Mich., has purchased the automatic polishing and buffing machinery division of the Continental Roll & Steel Foundry Co., East Chicago, Ind., and will move it to Kalamazoo.

P. R. Mallory & Co. Inc., Indianapolis, manufacturer of nonferrous alloy resistance welding electrodes and electrical contacts, has completed a 24,000 square foot expansion program principally to meet demand for national defense production.

Spraying Systems Co., Chicago, has appointed F. R. Magill, 1807 First National Bank building, Pittsburgh, representative in western Pennsylvania, and in neighboring steel districts of Ohio and West Virginia. Also recently appointed is the Manufacturers' Supply Co., 1201 C street, N. E., Washington.

A \$625,000 expansion program by Johns-Manville has been approved by directors. The program will include installation of manufacturing equipment in the recently acquired plant at Zelenople, Pa., where insulating brick will be manufactured, and new warehouses at plants in Nashua, N. H., and Richmond, Ind. Instead of meeting in the board room in New York, the directors went to the company's Manville, N. J., plant, 35 miles away, and spent the day in the various departments.

York Ice Machinery Corp., York, Pa., has been awarded contract for

four complete refrigerating units for the Ford Motor Co.'s new aircraft engine plant in Dearborn, Mich. This is said to be the largest industrial air conditioning contract ever awarded as a single installation. The cooling systems will supply a refrigerating effect equal to the melting of 4000 tons of ice per day.

Dravo Corp., Pittsburgh, has booked a contract for a welded steel liquid carrier for use on the Ohio river by Semet-Solvay Corp., New York. It will be equipped with heating coils and pumps for barging tar products. Dravo has completed the second of four barges for Union Barge Line, all welded, 26 x 175 feet, 11 feet deep, with rolling covers.

Canadian War Orders \$27,819,729 in Week

TORONTO, ONT.

■ Department of munitions and supply, Ottawa, announced placing 2756 contracts with a total value of \$27,819,729 in the past week. United States firms were awarded orders valued at \$122,627. The list included:

Mechanical transport: Ford Motor Co. of Canada Ltd., Windsor, \$7,256,100; Chrysler Corp. of Canada Ltd., Windsor, \$92,918; International Harvester Co. of Canada Ltd., Ottawa, \$90,956; Canadian National Carbon Co. Ltd., Toronto, \$5999.

Aircraft: Fleet Aircraft Ltd., Fort Erie, Ont., \$4,065,768; Standard Tube Co. Ltd., \$78,665; Canadian Vickers Ltd., Montreal, \$23,976; Turnbull Elevator Co. Ltd., Toronto, \$15,844; National Steel Car Corp., Malton, Ont., \$14,141; Boeing Aircraft of Canada Ltd., Vancouver, B. C., \$26,361.

Instruments: United States Gauge Co., Montreal, \$106,824; Aviation Equipment & Export Inc., Ottawa, \$35,645; Instruments Limited, Ottawa, \$163,520; Northern Electric Co. Ltd., Ottawa, \$27,712; Ontario Hughes-Owens Co. Ltd., Ottawa, \$952,080; Sutton-Horsley Co. Ltd., Toronto, \$228,125.

Electrical equipment: Air Ministry, England, \$45,500; Canada Wire & Cable Co. Ltd., Montreal, \$12,675; Canadian Marconi Co., Montreal, \$39,958; Canadian General Electric Co. Ltd., Ottawa, \$12,699; Northern Electric Co. Ltd., \$12,689; Renfrew Electric & Refrigerator Co. Ltd., Renfrew, Ont., \$13,041; Outboard Marine & Mfg. Co. of Canada Ltd., Peterborough, Ont., \$36,558.

Hardware: Dominion Wire Rope & Cable Co. Ltd., Montreal, \$11,772; Mis-Canada Mfg. Co. Ltd., Ottawa, \$10,250.

Machinery: Canadian Pratt & Whitney Aircraft Co. Ltd., Longueuil, Que., \$27,540; Canadian Car & Foundry Co. Ltd., Montreal, \$5625; Dominion Hoist & Shovel Co. Ltd., Montreal, \$12,014; Williams & Wilson Ltd., Montreal, \$21,666; Pritchard Andrews Co. of Ottawa Ltd., Ottawa, \$5735; A. R. Williams Machinery Co. Ltd., Toronto, \$5283; Canadian Machinery Corp. Ltd., Galt, Ont., \$6034.

Munitions: Defence Industries Ltd., Montreal, \$249,600.

Shipbuilding: Halifax Shipyards Ltd.,

Halifax, N. S., \$8642; Grenfell Boats, North Vancouver, B. C., \$21,480.

Dockyard supplies: The Canadian Marconi Co., Montreal, \$14,742; Drummond, McCall & Co. Ltd., Montreal, \$11,277.

Miscellaneous: General Steel Wares Ltd., Ottawa, \$79,610; Stamped & Enamelled Ware Ltd., Hespeler, Ont., \$6635; The Pedlar People Ltd., Oshawa, \$11,166; Storrar Mfg. Co. Ltd., Weston, Ont., \$8257; Johnson Bros. & Co. Ltd., Brantford, \$94,726; Storms Contracting Co. Ltd., Toronto, \$46,000; Horton Steel Works Ltd., Fort Erie, \$10,875.

Construction projects: Fundy Construction Co. Ltd., Halifax, N. S., \$51,150; Ralph & Arthur Parsons, Windsor, N. S., \$152,905; John Flood & Sons Ltd., Saint John N. B., \$128,872; Komo Construction Ltd., Quebec, Que., \$245,360; Angus Robertson Ltd., Montreal, \$499,000; Ernest A. Jones Ltd., Leaside, Ont., \$65,299; Frontenac Construction Co. Ltd., Toronto, \$114,400; Ryan Contracting Co. Ltd., Windsor, Ont., \$104,907; Bird Construction Co. Ltd., Winnipeg, Man., \$1,213,842; Claydon Co. Ltd., Winnipeg, \$353,578; Fraser MacDonald Co. Ltd., Winnipeg, \$448,278; P. W. Graham & Sons Ltd., Moose Jaw, Sask., \$337,214; National Contracting & Supply Co. Ltd., Prince Albert, Sask., \$214,711; A. W. Heise Co. Ltd., Saskatoon, Sask., \$404,809; Northern Boat Building Co. Ltd., Edmonton, Alta., \$106,734.

Dominion's Steel Output Lower in September

■ Production of steel ingots in Canada declined from 172,210 gross tons in August to 164,515 tons in September. Pig iron output in September, 105,020 tons, was the highest since August, 1929, and compared with 88,885 tons in August, this year. For nine months steel ingot production totaled 1,464,548 tons, against 937,693 tons in the corresponding period in 1939. Comparisons are shown below, in gross tons:

	Steel ingots	Pig iron	Ferro-alloys
Sept., 1940....	164,515	105,020	13,147
August, 1940...	172,210	88,885	9,697
Sept., 1939....	124,384	65,954	10,406
9 mos., 1940...	1,464,548	839,456	90,345
9 mos., 1939...	937,693	487,982	51,098

Canadian Foreign Trade Nearly Double Year Ago

■ Canadian steel imports in August totaled \$30,788,000, compared with \$15,854,000 in August, 1939. Imports from the United States were valued at \$27,956,000. These included machinery, except agricultural, \$6,315,000; vehicles, \$5,778,000; automobiles and parts, \$5,559,000; rolling mill products, \$5,048,000; farm implements, \$3,500,000; tractors and parts, \$1,525,000; engines and boilers, \$876,000; steel and iron scrap, \$722,000; iron ore, \$659,000. In August, 1939, imports from the United States were valued at \$13,021,000.

August exports totaled \$11,659,000, compared with \$5,780,000 in August, 1939. Exports to the United States amounted to \$532,000, against \$348,000 in the month last year.

< < HELPFUL LITERATURE > >

1. Wire Screen & Cloth

Wickwire Spencer Steel Co.—48-page illustrated catalog, "Wissco Wire Cloth and Woven Wire Screens," contains charts, graphs, diagrams, specifications, and other information necessary to select proper wire cloth for any application in screening, filtering, separating, grading, cleaning, or processing operations.

2. Nickel-Clad Plate

International Nickel Co.—16-page illustrated technical bulletin No. T-4 presents in detail methods for fabrication of nickel-clad steel plate. Such factors as standards of cladding, physical properties, surface cleaning, welding, joining and applications are covered by text and sectional drawings.

3. Photoelectric Relays

General Electric Co.—4-page illustrated bulletin No. GEA-1755C shows construction and application of G-E photoelectric relays and accessories for many types of control problems. Complete data and descriptions are given for each component part of the system.

4. Flexible Couplings

W. A. Jones Foundry & Machine Co.—4-page illustrated bulletin No. 78 gives list prices and specifications of flanged semi steel couplings using pins which engage in fabric disc, and of semi steel style D units utilizing a floating center of steel which has tongues to engage in grooves of end castings.

5. Ball Bearing Units

Fafnir Bearing Co.—4-page illustrated folder L is descriptive of "Mechani-Seal" ball bearing transmission units. Features and specifications are given for single pillow blocks, flange cartridges and cylindrical cartridges for all normal load applications.

6. Barges

Dravo Corp.—8-page illustrated bulletin, "Timing Barge Building with Barge Buying," reviews production facilities of this company and the application of welded steel construction to building of barges. Application details of assembly line construction to this work are given.

7. Worm Gear Reducers

Link-Belt Co.—16-page illustrated bulletin No. 1524B presents complete data on single worm reduction, helical worm reduction, and double worm reduction gear reducer units. Selection information, horsepower ratings and specifications for all available sizes and types are given.

8. Clamshell Buckets

Blaw-Knox Co.—36-page illustrated catalog No. 1696, "Buckets for Single Drum Hoists," describes single line hook-on buckets, single line direct reeved buckets, two-line hook-on buckets, controllable discharge foundry buckets, dumping buckets, and ingot tongs. Selection data, installation views, and specifications are included.

9. Refractory Concrete

Atlas Lumnite Cement Co.—24-page illustrated bulletin, "Refractory Concrete," gives methods for making refractory concrete with "Lumnite" for low, medium and high temperature furnaces. Heat resistant concrete for construction of flues, ducts, foundations and floors is described. Tables of mixes include conductivity factors.

10. Bearing Lubrication

U. S. Electrical Motors, Inc.—4-page illustrated bulletin No. 1048 shows details of "U. S. Lubriflush" bearings which permit clean lubricant to be introduced without need for cleaning out old lubricant. Fresh lubricant purges sludge from bearing. Application to electric motors is shown.

11. Graphitic Steels

Timken Roller Bearing Co.—16-page illustrated bulletin, "Timken Graphitic Steels" gives specifications, shows applications, and answers questions regarding "Graph-Tung," "Graph-Sil," and "Graph-Mo" graphitic steels. Selection and heat treatment guidance are given for tools, dies and parts.

12. Surface Plates

Challenge Machinery Co.—8-page illustrated catalog No. F.835-A gives specifications of layout surface plates, benches and bench tops, bench plates, lapping plates, cut-off machines, V-blocks, and parallel blocks which are used in tool and machine industries.

13. Gear Grinding Unit

National Broach & Machine Co.—4-page illustrated bulletin, "The New Red Wing Gear Grinding Machine," gives details of machine and shows application for the production of accurate hardened gears for automotive, airplane, and other industries.

14. Induction Motors

Reliance Electric & Engineering Co.—4-page illustrated bulletin No. 119 presents complete specifications and shows construction details of type AA squirrel-cage induction motors for 2 or 3-phase alternating current circuits, 40 degree Cent. continuous duty, open rating.

15. Metal Cutting System

E. C. Atkins & Co.—24-page illustrated spiral-bound catalog, "Atkins Curled Chip Metal Cutting System," gives details of design of milling, segmental, power and band saws employing this principle. Through tooth design, each chip is curled and cutting speed is claimed to be greatly increased.

16. Bearing Lubrication

New Departure, Div. General Motors Sales Corp.—16-page illustrated manual No. A-120 is entitled "Lubrication of New Departure Ball Bearings." Lubrication principles, grease specifications, oils, speed factors, lubrication fixtures and methods are some of the subjects covered by text.

17. Furnaces

Surface Combustion Corp.—4-page illustrated bulletin No. SC-94 discusses briefly the function of furnaces in industry in the National Defense program. Heat treating of armor plate, airplane parts, shells, gun tubes and mounts is mentioned. Furnaces installed in "Defense" industries are shown.

18. Milling Machine

U. S. Tool Co.—8-page illustrated bulletin No. 40C shows application of "Multi-Millers" for continuous milling of form stock, rotary milling, automatic cut-off operations, automatic indexing, vertical milling, and high speed grinding.

19. V-Belt Drives

Worthington Pump & Machinery Manufacturing Co.—72-page illustrated "Multi-V-Drive" master manual shows advantages of V-belt power transmissions. Information is given on design and selection of V-belt drive equipment. Included are many pages of helpful operating hints.

20. Conveyor-Elevators

Stephens-Adamson Manufacturing Co.—64-page illustrated catalog No. 140 is descriptive of horizontal and vertical closed circuit "Redler" units as well as standard conveying and elevating elements. Complete specifications and dimensions, as well as many applications are given.

21. Machine Tool Castings

Meehanite Research Institute of America, Inc.—16-page illustrated bulletin No. 9 is entitled, "Meehanite, the Metal for Machine Tool Castings." It includes a variety of applications of "Meehanite" castings in the machine tool industry. Details of castings are given.

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22. Plant Protection

Graybar Electric Co.—4-page illustrated bulletin, "Planned Protection," includes a check list of equipment for protection against plant intrusion and sabotage. Types of equipment such as protective lighting, fire and burglar alarms, intercommunication systems, and signaling accessories are covered briefly.

23. Tool Grinder

Carboloy Co.—2-page illustrated bulletin No. GT-121 is descriptive of the new "Carboloy" chip breaker grinder for producing chip breakers on "Carboloy" tipped tools to exact specifications. This machine is a precision tool for maintenance of maximum productive capacity of tipped cutting tools.

24. Electrical Controls

Westinghouse Electric & Manufacturing Co.—64-page illustrated "Quick Selector" catalog No. 30-000 simplifies selection of correct electrical equipment for any motor, lighting, or feeder circuit. Electrical ratings, dimensions and circuit diagrams are given for switches, circuit breakers, panelboards, motors and motor controls. Prices for each device are included.

25. Hydraulic Control

Hydro-Power Systems, Inc.—16-page illustrated bulletin No. 403 gives details of controls for application with all types of "Hydro-Power" radial pressure generators for use with hydraulic machinery. Controls are available for pressure regulation, volume regulation, reversible discharge and combinations of these functions.

26. Alloys

Electro Metallurgical Co.—24-page booklet No. F.2165-B contains descriptions and suggestions for use of recently developed "Electromet" ferro-alloys and metals as well as of regular alloys. Data on alloys containing chromium, manganese, silicon, calcium, vanadium, tungsten, zirconium, columbium, and boron are included. Composition and available sizes are given.

27. Drill Pipe

Jones & Laughlin Steel Corp.—12-page illustrated bulletin No. ADS-130 gives complete information on "J. & L. Integral Joint Blue Ribbon" drill pipe. Advantages, specifications and properties of this pipe are given. Details of construction, as well as a code on care and use, are included.

28. Cutter & Tool Grinder

Cincinnati Milling Machine & Cincinnati Grinders, Inc.—32-page illustrated bulletin No. M-777 is descriptive of No. 2 cutter and tool grinder for correctly sharpening tools and cutters. Features, specifications, operation, and available attachments are covered in detail.

HELPFUL LITERATURE

(Continued)

29. Floor Repair

United Maintenance Sales Co.—4-page bulletin, "Powdered Eburnated Cement," gives complete specifications on this material for resurfacing and repairing wood or concrete floors. This resilient type of flooring is said to resist wear and is easy to apply.

30. Transformers

Allis-Chalmers Manufacturing Co.—16-page illustrated bulletin No. B-6096 describes and shows design features of line of distribution transformers in ratings of 1½ to 25 kilovolt-amperes and standard classifications from 2400 to 7620 volts. Details of construction are given also.

31. Tool Grinding

Norton Co.—32-page illustrated booklet No. 571, entitled "Grinding 'Haynes Stellite' J-Metal and '2400' Cutting Tools," is a manual on this subject. Characteristics of metal, recommended grinding wheels, sharpening instructions, tool forms, and similar information is presented.

32. Broach Machine

Colonial Broach Co.—8-page illustrated broadside No. 100-8A includes specifications and shows details of universal high speed "Super" broach machine. Spiral drive attachment, automatic pullers, chip trough and follow rests are described for this production machine.

33. Excavator Ropes

Macwythe Co.—6-page illustrated folder No. 40-120 shows function of "Whyte Strand" excavator ropes in construction of the Pennsylvania Turnpike. Construction details of types of regular and preformed rope are shown and described.

34. Tipped Tools

McKenna Metals, Inc.—16-page illustrated price list No. 5 lists new low prices on 20 standard "Kennametal" tipped tools, five styles of blanks, nine semi-standard tools, two milling cutters, and three lathe and grinder centers. Prices are given for blank weights from one to 1000 grams of "Kennametal."

35. Welding Rod

Ampeco Metal, Inc.—8-page illustrated bulletin, "New Ampeco-Weld," gives specifications and properties of "Ampeco" metal weld rods. These coated aluminum bronze electrodes are applicable for fabrication and repair without need for preheating to high temperature. Recommendations and applications of various grades are given.

36. Salt Bath Furnace

Ajax Electric Co.—20-page illustrated catalog No. 107 describes the "Ajax-Hultgren" electric salt bath furnace. Detailed data is given on heat treating applications such as carburizing, cyanide hardening, hardening carbon and high speed steel tools without scale or decarburization, heat treating aluminum alloys, and heating for forging and brazing.

37. Bearing Metals

A. W. Cadman Manufacturing Co.—12-page illustrated bulletin No. M-2 contains technical information regarding babbitt, requirements of bearings, bearing alloys, friction, lubrication, bearing pressures and other data of use to those concerned with design, manufacturing, maintenance or application of bearings and bearing metals.

38. Rust Preventive

American Chemical Paint Co.—4-page bulletin No. 8-2 describes applications, recommendations, and directions for use of "Elastic Primer," a product which prevents rust on structural steel. This material contains a rust inhibitor to further prevent corrosion.

39. Threading Equipment

Landis Machine Co.—12-page illustrated bulletin, "Landis Munitions Threading Equipment," describes various types of die heads and threading machines available for munitions threading operations. Applications are shown and equipment employed is detailed.

40. Welding Manual

Lincoln Electric Co.—58-page illustrated "Weldirectory" gives procedures for producing all types of welds in mild steel for welding metals used to any extent in industry, and for applying surface metal for wear resistance. This is a guide book to welding and gives properties of and selection guidance for available types of electrodes.

41. Pillow Blocks

Shafer Bearing Corp.—4-page illustrated bulletin No. 526 is descriptive of "ConCaVeX" pillow blocks equipped with self-aligning radial-thrust roller bearings. In addition to details of bearing design and application, condensed listings of available sizes and types are given. List prices are included.

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First Quarter 1941 Steel Prices Expected Soon

Reaffirmation of ferroalloys and other items may indicate trend. Extending deliveries expected for at least another sixty days.

■ ANNOUNCEMENT of first quarter iron and steel prices is expected to be the next major development of the industry, action which many look for by Nov. 15, no important changes being expected. Prices of ferromanganese and other alloys and certain minor items were reaffirmed late last week and may indicate the general price trend. Reasons advanced for the probable stability of prices are good steel company earnings, as shown by recent reports; sentiment at Washington in favor of moderation of prices generally; reasonably low raw materials prices and desire of steel producers to keep all phases of business on an even keel.

Only a rise in costs would force up steel prices at this time, it is believed. Moreover a mere reaffirmation of prices would relieve slightly the tension on deliveries as some consumers having December contracts would ask them postponed into 1941. The failure of a general pig iron advance to materialize is also a straw indicating unchanged steel quotations generally.

Steel production last week was unchanged at 96½ per cent of capacity.

Prices are still a minor consideration alongside desire of reasonably prompt deliveries. Shipping dates continue to be extended, though at a mild rate. Producers who are sold up for two months predict three months' backlogs by spring. Consumers' inventories on Dec. 31 will be the lightest in years. Stocks of warehouses are badly depleted in certain sizes and shapes while they try to supply many mill customers in addition to their own.

Users of pig iron and scrap often find it necessary to accept analyses slightly different from their customary ones. Some steel makers plan to barter raw materials among one another, such as coke for pig iron. Yet materials are as yet by no means of famine proportions, problems being of fair distribution rather than supply.

Production of open-hearth and bessemer ingots in October of 6,461,898 tons was the highest on record, according to the American Iron and Steel institute, with the average rate of 96.10 per cent, compared with 93.71 per cent in November, 1939, the previous peak

of recent years. The institute's weekly predictions in October averaged 94.36 per cent, indicating better performance than promise through crowding of furnaces. Bessemer converters worked at 80.13 per cent in October, therein being the best field for future gain.

Automobile assemblies are due to reach new 1940 highs for the week ended Nov. 9 at an estimated 120,948 units, compared with 86,200 a year ago and up 2856 units in a week.

Orders for freight cars in October were 12,195, the largest since October of last year. For 1940 up to Nov. 1 orders have been 51,492 freight cars as against 55,090 for the same period of 1939. Prominent in railroad business are sales for export to Brazil of 46 locomotives, one lot of 26 for the Ministry of Public Works; the other of 20 to the state of Sao Paulo, which bought four three-coach multiple-unit trains.

Plates and shapes continue products most difficult to deliver with reasonable promptness. One company has ordered salesmen to cut by a half to two-thirds their number of calls. Steelmakers see no chance of continually extending deliveries stabilizing within another 60 days.

The three composite price compilations of the magazine STEEL are again unchanged, this being the fifth consecutive week for the usually more volatile steel scrap item at \$20.54. Iron and steel remains at \$38.06; finished steel, at \$56.60.

The unchanged production rate of 96½ per cent was the result of advances in two districts, declines in five and unchanged rates in five. Pittsburgh rose 2 points to 97 per cent and Youngstown gained 1 point to 92 per cent. Declines were: Chicago, 1 point to 97; Cleveland, 3½ points to 86½; Buffalo, 2 points to 93; New England, 5 points to 85 and Detroit, 2 points to 93. Unchanged were eastern Pennsylvania at 94, Wheeling at 98½, Birmingham at 100, Cincinnati at 94 and St. Louis at 85 per cent.

Shipments of finished products by the United States Steel Corp. in October were 1,572,408 net tons, highest since the all-time top of 1,701,874 tons in May, 1929. Shipments over the first ten months of the year have been 12,006,135 tons against 8,901,942 tons for the corresponding span of 1939.

MARKET IN TABLOID ★

Demand

Greater than output.

Prices

Strong, with reaffirmation expected.

Production

Unchanged at 96½ per cent.

COMPOSITE MARKET AVERAGES

	Nov. 9	Nov. 2	Oct. 26	One Month Ago Oct., 1940	Three Months Ago Aug., 1940	One Year Ago Nov., 1939	Five Years Ago Nov., 1935
Iron and Steel....	\$38.06	\$38.06	\$38.07	\$38.07	\$37.70	\$37.50	\$33.15
Finished Steel	56.60	56.60	56.60	56.60	56.60	55.90	53.70
Steelworks Scrap..	20.54	20.54	20.54	20.56	18.71	20.06	12.92

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

	Nov. 9, 1940	Oct. 1940	Aug. 1940	Nov. 1939		Nov. 9, 1940	Oct. 1940	Aug. 1940	Nov. 1939
Finished Material					Pig Iron				
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh	\$24.34	\$24.34	\$24.34	\$24.34
Steel bars, Chicago	2.15	2.15	2.15	2.15	Basic, Valley	22.50	22.50	22.50	22.50
Steel bars, Philadelphia	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia	24.34	24.34	24.34	24.34
Iron bars, Chicago	2.25	2.25	2.15	2.15	No. 2 foundry, Pittsburgh	24.21	24.21	24.21	24.21
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago	23.00	23.00	23.00	23.00
Shapes, Philadelphia	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham....	19.38	19.38	19.38	19.38
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2 del. Cincinnati..	23.06	23.06	23.06	23.06
Plates, Pittsburgh	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ. av.)..	25.215	25.215	25.215	25.215
Plates, Philadelphia	2.15	2.15	2.15	2.275	Malleable, Valley	23.00	23.00	23.00	23.00
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Chicago	23.00	23.00	23.00	23.00
Sheets, hot-rolled, Pittsburgh....	2.10	2.10	2.10	2.00	Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	30.34
Sheets, cold-rolled, Pittsburgh....	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh....	23.17	23.17	23.17	23.17
Sheets, No. 24 galv., Pittsburgh....	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	105.33
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.00	Scrap				
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05	Heavy melt. steel, Pitts.	\$21.50	\$21.30	\$18.75	\$21.90
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50	Heavy melt. steel, No. 2, E. Pa...	19.75	19.75	18.35	19.25
Bright bess., basic wire, Pitts....	2.60	2.60	2.60	2.60	Heavy melting steel, Chicago....	19.75	19.85	18.15	17.45
Tin plate, per base box, Pitts....	\$5.00	\$5.00	\$5.00	\$5.00	Rails for rolling, Chicago	24.25	24.05	22.00	20.50
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55	Railroad steel specialties, Chicago	23.25	23.25	21.05	21.50
Semifinished Material					Coke				
Sheet bars, Pittsburgh, Chicago....	\$34.00	\$34.00	\$34.00	\$34.00	Connellsville, furnace, ovens....	\$4.75	\$4.75	\$4.75	\$5.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00	Connellsville, foundry, ovens....	5.75	5.75	5.75	6.00
Rerolling billets, Pittsburgh....	34.00	34.00	34.00	34.00	Chicago, by-product fdry., del...	11.75	11.75	11.25	11.25
Wre rods No. 5 to 3/4-inch, Pitts..	2.00	2.00	2.00	1.92					

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled	
Pittsburgh	2.10c
Chicago, Gary	2.10c
Cleveland	2.10c
Detroit, del.	2.20c
Buffalo	2.10c
Sparrows Point, Md.	2.10c
New York, del.	2.34c
Philadelphia, del.	2.27c
Granite City, Ill.	2.20c
Middletown, O.	2.10c
Youngstown, O.	2.10c
Birmingham	2.10c
Pacific Coast ports	2.65c
Cold Rolled	
Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast ports	3.70c
Galvanized No. 24	
Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c

Granite City, Ill.	3.60c	
Middletown, O.	3.50c	
Youngstown, O.	3.50c	
Pacific Coast ports	4.05c	
Black Plate, No. 29 and Lighter		
Pittsburgh	3.05c	
Chicago, Gary	3.05c	
Granite City, Ill.	3.15c	
Long Terns 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.	No.	No.
Bars	410	430	442
		446	

Plates ..	21.50	22.00	25.50	30.50
Sheets ..	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

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.	2.21 1/2 c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c

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	2.47c
Philadelphia, del.	2.52c
Boston, delivered	2.49c
New York, del.	2.50c
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

STEEL

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	
<i>New Billet Bars, Base</i>	
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Rail Steel Bars, Base	
Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.50c

Wire Products

<i>Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads</i>	
Standard and cement coated wire nails	
(Per Pound)	
Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c
Woven wire fencing (base C. L. column)	
Single loop bale ties (base C.L. column)	67
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, Chi. Massillon, Canton, Bethlehem			
Detroit, delivered	2.70c		2.80c
Alloy			
S.A.E. Diff.	S.A.E.	Alloy Diff.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.70	3300	3.80
2500	2.55	3400	3.20
4100 0.15 to 0.25 Mo.			0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.			1.20
5100 0.80-1.10 Cr.			0.45
5100 Cr. spring flats			0.15
6100 bars			1.20
6100 spring flats			0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200 spring flats			0.15
9200 spring rounds, squares			0.40
Electric furnace up 50 cents.			

Alloy Plates (Hot)

Pittsburgh, Chicago, Coatesville, Pa. 3.50c

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

<i>F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%. full containers, add 10%.</i>	
Carriage and Machine	
1/2 x 6 and smaller	68 off
Do., 3/4 and 1/2 x 6-in. and shorter	66 off
Do., 3/4 to 1 x 6-in. and shorter	64 off
1 1/2 and larger, all lengths. 62 off	
All diameters, over 6-in. long	62 off
Tire bolts	52.5 off

Stove Bolts	
In packages with nuts separate 72.5-10 off; with nuts attached 72.5 off; bulk 82 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.	
Step bolts	60 off
Plow bolts	68.5 off

Nuts			
Semifinished hex.	U.S.S.	S.A.E.	
1/2-inch and less.	66	70	
3/8-1-inch	63	65	
1 1/2-1-inch	61	62	
1 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

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., B'ham.

Structural	3.40c
1/2-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. Pitt. Lorain, to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 1/2 and 1 1/2 less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel			
In.	Bik.	Galv.	
1/2	63 1/2	54	
3/4	66 1/2	58	
1-3	68 1/2	60 1/2	
Iron			
3/4	30	13	
1-1 1/4	34	19	
1 1/2	38	21 1/2	
2	37 1/2	21	

Lap Weld Steel			
2	61	52 1/2	
2 1/2-3	64	55 1/2	
3 1/2-6	66	57 1/2	
7 and 8	65	55 1/2	
Iron			
2	30 1/2	15	
2 1/2-3 1/2	31 1/2	17 1/2	
4	33 1/2	21	
4 1/2-8	32 1/2	20	
9-12	28 1/2	15	

Line Pipe Steel			
1 to 3, butt weld	67 1/2		
2, lap weld	60		
2 1/2 to 3, lap weld	63		
3 1/2 to 6, lap weld	65		
7 and 8, lap weld	64		
Iron			
3/4 butt weld	25	7	
1 and 1 1/4 butt weld	29	13	
1 1/2 butt weld	33	15 1/2	
2 butt weld	32 1/2	15	
1 1/2 lap weld	23 1/2	7	
2 lap weld	25 1/2	9	
2 1/2 to 3 1/2 lap weld	26 1/2	11 1/2	
4 lap weld	28 1/2	15	
4 1/2 to 8 lap weld	27 1/2	14	
9 to 12 lap weld	23 1/2	9	

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut-lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded			
Sizes	Gage	Steel	Charcoal Iron
1 1/4" O.D.	13	\$ 9.72	\$23.71
1 3/4" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2 1/4" O.D.	13	13.79	21.68
2 3/4" O.D.	12	15.16	
3" O.D.	12	16.58	26.57
3 1/4" O.D.	12	17.54	29.00
3 3/4" O.D.	12	18.35	31.36
4" O.D.	11	23.15	39.81
4 1/4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
5 1/2" O.D.	7	68.14	

Seamless			
Sizes	Hot Gage	Cold Rolled	Drawn
1" O.D.	13	\$ 7.82	\$ 9.01
1 1/4" O.D.	13	9.26	10.67
1 1/2" O.D.	13	10.23	11.79
1 3/4" O.D.	13	11.64	13.42

2" O.D.	13	13.04	15.03
2 1/4" O.D.	13	14.54	16.76
2 1/2" O.D.	12	16.01	18.45
2 3/4" O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 1/2" O.D.	12	19.50	22.48
4" O.D.	11	24.62	28.37
4 1/4" O.D.	10	30.54	35.20
4 1/2" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Pet Net Ton	
6-in. & over, Birm.	\$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00
Class A Pipe \$3 over Class B	
Std. flgs., Birm., base	\$100.00.

Semifinished Steel

Rerolling Billets, Slabs (Gross Tons)	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00
Forging Quality Billets	
Pitts., 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 3 1/2-inch incl. (per 100 lbs.)	\$2.00
Do., over 3 1/2 to 1 1/2-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.	5.25-5.50
Connell, prem fdry.	5.75-6.25
New River fdry.	6.50-7.00
Wise county fary	5.50-6.50
Wise county fur.	5.00-5.25

By-Product Foundry	
Newark, N. J., del.	11.88-12.38
Chicago, outside del.	11.00
Chicago, delivered	11.75
Terre Haute, del.	11.25
Milwaukee, ovens	11.75
New England, del.	12.50
St Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	11.25
Cincinnati, del.	11.00
Cleveland, del.	11.55
Buffalo, del.	11.75
Detroit, del.	11.50
Philadelphia, del.	11.63

Coke By-Products

<i>Spot, gal., freight allowed east of Omaha</i>	
Pure and 90% benzol	15.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xytol	26.00c
<i>Per lb. f.o.b. Frankford and St. Louis</i>	
Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c
<i>Eastern Plants, per lb.</i>	
Naphthalene flakes, balls, bbls. to jobbers	7.00c
<i>Per ton, bulk, f.o.b. port</i>	
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
Birmingham, Ala.	19.38		18.38	24.00
Bldrsboro, Pa.	24.00	24.50	23.50	25.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	24.00
Duluth	23.50	23.50		24.00
Erle, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	23.50
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	22.00			
*Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00		23.50	
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

†Subject to 38 cents deduction for 0.70 per cent phosphorus or higher. *One producer quotes \$2 higher on bessemer, \$1.50 higher on other grades.

Delivered from Basing Points:	24.39	24.39	23.89	24.89
Akron, O., from Cleveland	24.39		23.66	
Baltimore from Birmingham	24.78			
Boston from Birmingham	24.12			
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00		
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22			
Cincinnati from Hamilton, O.	23.24	24.11	23.61	
Cincinnati from Birmingham	23.06		22.06	
Cleveland from Birmingham	23.32		22.82	
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15			
Newark, N. J., from Bethlehem	25.53	26.03		
Philadelphia from Birmingham	24.46		23.96	
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	
Pittsburgh district from Neville Island	†Neville base, plus 69c, 84c, and \$1.24 freight.			
Saginaw, Mich., from Detroit	25.31	25.31	24.81	25.81
St. Louis, northern	23.50	23.50	23.00	

	No. 2 Fdry.	Malleable	Basic	Bessemer
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: Bldrsboro 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	Ladle Brick (Pa., O., W. Va., Mo.)
Fire Clay Brick	Dry press. \$28.00
Super Quality	Wire cut. 26.00
Pa., Mo., Ky.	Magnesite
First Quality	Domestic dead-burned grains, net ton f.o.b. 22.00
Pa., Ill., Md., Mo., Ky.	Chewelah, Wash., net ton, bulk 26.00
Alabama, Georgia	net ton, bags 26.00
New Jersey	Basic Brick
Second Quality	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa. 34.20
Pa., Ill., Ky., Md., Mo.	Chrome brick 50.00
Georgia, Alabama	Chem. bonded chrome 50.00
New Jersey	Magnesite brick 72.00
Ohio	Chem. bonded magnesite 61.00
First quality	Fluorspar
Intermediate	Washed gravel, duty pd., tide, net ton \$25.00-\$26.00
Second quality	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail 19.00
Malleable Bung Brick	Do. barge 19.00
All bases	No. 2 lump 20.00
Silica Brick	
Pennsylvania	\$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ferrolloy Prices

Ferromanganese, 78-82%, carlots, duty pd.	\$120.00	Do., ton lots	11.75c	Do., spot	145.00	Silicon Metal, 1% iron, contract, carlots, 2 x 1/4-in., lb.	14.50c
Ton lots	130.00	Do., less-ton lots	12.00c	Do., contract, ton lots	145.00	Do., 2% Spot 1/4-cent higher	13.50c
Less ton lots	133.50	less than 200 lb. lots	12.25c	Do., spot, ton lots	150.00		
Less 200 lb. lots	138.00	67-72% low carbon:		15-18% tl., 3-5% carbon, carlots, contr., net ton	157.50	Silicon Briquets, contract carloads, bulk, freight allowed, ton	\$74.50
Do., carlots del. Pitts.	125.33	Car. Ton Less loads lots ton		Do., spot	160.00	Ton lots	\$4.50
Splegeleisen, 19-21% dom.		2% carb.	17.50c 18.25c 18.75c	Do., contract, ton lots	160.00	Less-ton lots, lb.	4.00c
Palmerton, Pa., spot	36.00	1% carb.	18.50c 19.25c 19.75c	Do., spot, ton lots	165.00	Less 200 lb. lots, lb.	4.25c
Do., 26-28% spot	49.50	0.10% carb.	20.50c 21.25c 21.75c	Alsifer, contract carlots, f.o.b. Niagara Falls, lb.	7.50c	Spot 1/4-cent higher	
Ferrosilicon, 50%, freight allowed, c.l.	74.50	0.20% carb.	19.50c 20.25c 20.75c	Do., ton lots	8.00c	Manganese Briquets, contract carloads, bulk freight allowed, lb.	5.50c
Do., ton lot	87.00	Spot 1/4c higher		Do., less-ton lots	8.50c	Ton lots	6.00c
Do., 75 per cent	135.00	Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.	0.95	Spot 1/4c lb. higher		Less-ton lots	6.25c
Do., ton lots	151.00	Calcium molybdate, lb. molyb. cont., f.o.b. mill	0.80	Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk	7.00c	Spot 1/4c higher	
Silicomanganese, c.l., 2 1/2 per cent carbon	118.00	Ferrotitanium, 40-45%, lb., con. tl., f.o.b. Niagara Falls, ton lots	\$1.23	Do., ton lots	7.50c	Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton	102.50
2% carbon, 108.00; 1%, 133.00		Do., less-ton lots	1.25	Do., less-ton lots	7.75c	Do., spot	108.00
Contract ton price \$12.50 higher; spot \$5 over contract.		20-25% carbon, 0.10 max., ton lots, lb.	1.35	Do., less 200 lbs.	8.00c	34-40%, contract, carloads, lb., alloy	14.00c
Ferrotungsten, stand., lb. con. del. cars	1.90-2.00	Do., less-ton lots	1.40	Spot, 1/4c higher		Do., ton lots	15.00c
Ferrovannadium, 35 to 40%, lb., cont.	2.70-2.80-2.90	Spot 5c higher		Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb.	\$2.50	Do., less-ton lots	16.00c
Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric turn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage	75.00	Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls	\$2.25	Do., smaller lots	2.60	Spot 1/4c higher	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots	11.00c	Do., less-ton lots	2.30	Vanadium Pentoxide, contract, lb. contained	\$1.10	Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb.	\$2.60
		Spot 1s 10c higher		Do., spot	1.15	Do., 100-200 lb. lots	2.75
		Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill	0.80	Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome, ton lots	80.00c	Do., under 100-lb. lots	3.00
		Ferrocarbon-titanium, 15-18% tl., 6-8% carb., carlots, contr., net ton	\$142.50	Do., spot	85.00c	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant	80.00c
				88% chrome, cont. tons	79.00c		
				Do., spot	81.00c		

STEEL

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft			Plates ¾-In. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
	Bars	Bands	Hoops				Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	S.A.E. 2300	S.A.E. 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.66	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.30	3.51	4.09	8.84	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	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	3.05	....	4.05	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.40	3.22	3.75	8.40	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	4.62	3.20	3.75	8.40	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	8.70	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	7.20
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	9.09	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	6.45	4.00	4.00	6.40	4.30	6.50	5.25	....	6.60	10.55	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

	S.A.E. Hot-rolled Bars (Unannealed)				
	1035-1050 Series	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	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	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.53	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, 150-1499 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; 25 to 49 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 Official Rates of Exchange

Export Prices f.o.b. Port of Dispatch— <i>By Cable or Radio</i>	Domestic Prices at Works or Furnace— <i>Last Reported</i>											
	Continental Channel or North Sea ports, gross tons		French	Belgian	Reich							
	British gross tons U. K. ports £ s d	Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d	£ s d	Francs	Francs	Mark					
Foundry, 2.50-3.00 Sl. basic bessemer	\$33 23	3 18 0	Fdy. pig iron, Sl. 2.5. 24 24	6 0 0(a)	\$17.18	788	\$31.44	950	\$25.33	63	
Hematite, Phos. .03-.05	Basic bess. pig iron. 22 83	5 13 0(a)	.....	.....	29.79	900	27.94 (b)	69.50	
Billets	Furnace coke.....	6 77	1 13 5	4 91	225	10 92	320	7 64	19
Wire rods, No. 5 gage	\$31.95	3 15 0	Billets.....	42 42	10 10 0	26 62	1,221	42 20	1,275	38 79	96
Standard rails	60.71	7 2 6	Standard rails.....	2 30c	12 15 0	1 69c	1,692	2 06c	1,375	2 38c	132
Mechant bars	Merchant bars.....	2 78c	15 8 6ff	1 53c	1,530	2 06c	1,375	1 98c	110
Structural shapes	Structural shapes.....	2 48c	13 13 0ff	1 49c	1,487	2 06c	1,375	1 93c	107
Plates, ¼ in. or 5 mm.	Plates, ¼ in. or 5 mm.	2 55c	14 3 0ff	1 95c	1,951	2 42c	1,610	2 20c	127
Plates, ¼ in. or 5 mm.	Plates, ¼ in. or 5 mm.	3 49c	19 17 6ff	2 30c	2,295	2 85c	1,900	2 50c	144
Plates, ¼ in. or 5 mm.	Plates, ¼ in. or 5 mm.	4 07c	22 12 6	3 59c	3,589	4 80c	3,200	6 06c	370
Plates, ¼ in. or 5 mm.	Plates, ¼ in. or 5 mm.	3 83c	21 5 0	2 34c	2,340	3 00c	2,000	3 11c	173
Plates, ¼ in. or 5 mm.	Plates, ¼ in. or 5 mm.	2 01c	16 3 6ff	1 71c	1,713	2 48c	1,650	2 29c	127
Plates, ¼ in. or 5 mm.	Plates, ¼ in. or 5 mm. ....	.....	.....	.....	.....	.....	.....	.....	.....

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	18.00
Bos. dock No. 1 exp.	17.00-17.25
New Eng. del. No. 1	17.00-17.50
Buffalo, No. 1	20.50-21.00
Buffalo, No. 2	18.50-19.00
Chicago, No. 1	19.50-20.00
Chicago, auto, no alloy	18.50-19.00
Cincinnati, dealers	17.50-18.00
Cleveland, No. 1	20.50-21.00
Cleveland, No. 2	19.50-20.00
Detroit, No. 1	†16.25-16.75
Detroit, No. 2	†15.25-15.75
Eastern Pa., No. 1	20.50-21.00
Eastern Pa., No. 2	19.50-20.00
Federal, Ill., No. 2	16.25-16.75
Granite City, R. R. No. 1	17.25-17.75
Granite City, No. 2	16.00-16.50
Los Ang., No. 1 net	12.75-13.25
Los Ang., No. 2 net	11.75-12.25
N. Y. dock No. 1 exp.	†17.00
Pitts., No. 1 (R. R.)	23.00-23.50
Pittsburgh, No. 1	21.00-22.00
Pittsburgh, No. 2	19.50-20.00
St. Louis, No. 1	17.25-17.75
St. Louis, No. 2	16.25-16.75
San Fran., No. 1 net	13.00-13.50
San Fran., No. 2 net	12.00-12.50
Seattle, No. 1	15.00
Toronto, dlrs., No. 1	11.00-11.25
Valleys, No. 1	21.00-21.50

COMPRESSED SHEETS

Buffalo	18.50-19.00
Chicago, factory	19.00-19.50
Chicago, dealers	17.50-18.00
Cincinnati, dealers	16.00-16.50
Cleveland	20.00-20.50
Detroit	†18.00-18.50
E. Pa., new mat.	21.00
E. Pa., old mat.	17.50-18.00
Los Angeles, net	9.25-9.75
Pittsburgh	21.00-22.00
St. Louis	15.00-15.50
San Francisco, net.	9.50-10.00
Valleys	19.50-20.00

BUNDLED SHEETS

Buffalo, No. 1	18.50-19.00
Buffalo, No. 2	17.00-17.50
Cleveland	15.00-15.50
Pittsburgh	19.50-20.00
St. Louis	13.50-14.00
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	13.50-14.00
Cincinnati, dealers	11.50-12.00
Detroit	†14.50-14.75
St. Louis	13.00-13.50
Toronto, dealers	9.00

BUSHELING

Birmingham, No. 1	14.50
Buffalo, No. 1	18.50-19.00
Chicago, No. 1	18.50-19.00
Cincin., No. 1 deal.	13.00-13.50
Cincin., No. 2 deal.	7.25-7.75
Cleveland, No. 2	14.00-14.50
Detroit, No. 1 new	†17.25-17.75
Valleys, new, No. 1	19.50-20.00
Toronto, dealers	5.50-6.00

MACHINE TURNINGS (Long)

Birmingham	7.50
Buffalo	13.50-14.00

Chicago	13.75-14.25
Cincinnati, dealers	9.75-10.25
Cleveland, no alloy	13.50-14.00
Detroit	†9.75-10.25
Eastern Pa.	14.50-15.00
Los Angeles	4.00-5.00
New York	†9.00-9.50
Pittsburgh	15.50-16.00
St. Louis	10.50-11.00
San Francisco	5.00
Toronto, dealers	7.25-7.50
Valleys	14.00-14.50

SHOVELING TURNINGS

Buffalo	14.50-15.00
Cleveland	14.00-14.50
Chicago	13.50-14.00
Chicago, spl., anal.	15.00-15.50
Detroit	†12.00-12.50
Pitts., alloy-free	17.00-17.50

BORINGS AND TURNINGS

For Blast Furnace Use	
Boston district	†7.75-8.25
Buffalo	13.50-14.00
Cincinnati, dealers	8.00-8.25
Cleveland	14.00-14.50
Eastern Pa.	13.00-13.50
Detroit	†11.50-12.00
New York	†8.75-9.00
Pittsburgh	14.00-14.50
Toronto, dealers	7.00-7.25

AXLE TURNINGS

Buffalo	17.00-17.50
Boston district	†12.00-12.50
Chicago, elec. fur.	18.75-19.25
East. Pa. elec. fur.	19.50-20.00
St. Louis	13.25-13.75
Toronto	7.25-7.50

CAST IRON BORINGS

Birmingham	8.50
Boston dist. chem.	†9.75-10.00
Buffalo	13.50-14.00
Chicago	13.50-14.00
Cincinnati, dealers	8.00-8.25
Cleveland	14.00-14.50
Detroit	†11.75-12.25
E. Pa. chemical	14.50-15.00
New York	†10.00-10.50
St. Louis	10.00-10.50
Toronto, dealers	7.25-7.50

RAILROAD SPECIALTIES

Chicago	23.00-23.50
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ANGLE BARS—STEEL

Chicago	22.75-23.25
St. Louis	21.50-22.00

SPRINGS

Buffalo	25.00-25.50
Chicago, coil	24.50-25.00
Chicago, leaf	23.00-23.50
Eastern Pa.	25.00-26.00
Pittsburgh	27.50-28.00
St. Louis	22.00-22.50

STEEL RAILS, SHORT

Birmingham	19.50
Buffalo	25.50-26.00
Chicago (3 ft.)	22.75-23.25
Chicago (2 ft.)	24.00-24.50
Cincinnati, dealers	23.75-24.25
Detroit	†23.00-23.50
Pitts., 2 ft. and less	27.00-27.50
St. L. 2 ft. & less	23.75-24.00

STEEL RAILS, SCRAP

Birmingham	17.00
Boston district	†14.50-15.00

Buffalo	22.00-22.50
Chicago	19.50-20.00
Cleveland	24.00-24.50
Pittsburgh	24.00-24.50
St. Louis	20.50-21.00
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net	13.00-13.50
Cincinnati, dealers	12.75-13.25

RAILROAD GRATE BARS

Buffalo	14.50-15.00
Chicago, net	14.00-14.50
Cincinnati, dealers	12.25-12.75
Eastern Pa.	18.00-18.50
New York	†12.00-12.50
St. Louis	14.00-14.50

RAILROAD WROUGHT

Birmingham	16.00
Boston district	†9.50-10.00
Eastern Pa., No. 1	20.00-20.50
St. Louis, No. 1	14.50-15.00
St. Louis, No. 2	16.00-16.50

FORGE FLASHINGS

Boston district	†12.00-12.25
Buffalo	18.50-19.00
Cleveland	19.00-19.50
Detroit	†16.25-16.75
Pittsburgh	19.50-20.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	24.00-24.50

LOW PHOSPHORUS

Cleveland, crops	23.50-24.00
Eastern Pa., crops	25.00-25.50
Pitts., billet, bloom, slab crops	28.00-28.50

LOW PHOS. PUNCHINGS

Buffalo	24.50-25.00
Chicago	22.75-23.25
Cleveland	21.50-22.00
Eastern Pa.	25.00-25.50
Pittsburgh	26.50-27.00
Seattle	15.00
Detroit	†19.75-20.25

RAILS FOR ROLLING

5 feet and over	
Birmingham	20.00
Boston	†17.50-18.00
Chicago	24.00-24.50
New York	†18.50-19.00
Eastern Pa.	25.00-26.00
St. Louis	23.50-24.00

STEEL CAR AXLES

Birmingham	18.00
Boston district	†18.50-19.00
Chicago, net	23.50-24.00
Eastern Pa.	25.00-25.50
St. Louis	24.00-24.50

LOCOMOTIVE TIRES

Chicago (cut)	22.50-23.00
St. Louis, No. 1	20.50-21.00

SHAFTING

Boston district	†19.25-19.50
New York	†20.00-20.50

Eastern Pa.	25.00-25.50
St. Louis, 1¼-3¾	19.75-20.25

CAR WHEELS

Birmingham, iron	15.00
Boston dist., iron	†15.50-16.00
Buffalo, steel	25.00-25.50
Chicago, iron	21.00-21.50
Chicago, rolled steel	23.50-24.00
Cincin., iron deal.	20.00-20.50
Eastern Pa., iron	22.50-23.00
Eastern Pa., steel	25.50-26.00
Pittsburgh, iron	22.00-22.50
Pittsburgh, steel	27.50-28.00
St. Louis, iron	20.50-21.00
St. Louis, steel	22.00-22.50

NO. 1 CAST SCRAP

Birmingham	17.00
Boston, No. 1 mach.	†17.00-17.25
N. Eng. del. No. 2	16.00-16.25
N. Eng. del. textile	20.00-21.00
Buffalo, cupola	18.50-19.00
Buffalo, mach.	20.00-20.50
Chicago, agri. net.	15.50-16.00
Chicago, auto net.	18.00-18.50
Chicago, rail'd net	16.50-17.00
Chicago, mach. net.	17.75-18.25
Cincin., mach. deal.	20.75-21.25
Cleveland, mach.	22.50-23.00
Detroit, cupola, net	†16.75-17.25
Eastern Pa., cupola	22.50-23.00
E. Pa., No. 2	19.50
E. Pa., yard fdry.	19.50-20.00
Los Angeles	16.50-17.00
Pittsburgh, cupola	20.50-21.00
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	19.25-19.75
St. L., No. 1 mach.	19.75-20.25
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break	†15.50-15.75
New England, del.	17.00-17.50
Buffalo, break	17.50-18.00
Cleveland, break, net	16.50-17.00
Detroit, auto net	†17.00-17.50
Detroit, break	†14.75-15.25
Eastern Pa.	21.50
Los Ang., auto, net.	13.00-14.00
New York break	†16.00-16.50

STOVE PLATE

Birmingham	10.00-11.00
Boston district	†13.50-14.00
Buffalo	17.00-17.50
Chicago, net	13.00-13.50
Cincinnati, dealers	12.75-13.25
Detroit, net	†11.50-12.00
Eastern Pa.	18.00-18.50
New York fdry	†13.50
St. Louis	14.50-15.00
Toronto dealers, net	12.00

MALLEABLE

New England, del.	22.00-23.00
Buffalo	22.50-23.00
Chicago, R. R.	23.50-24.00
Cincin. agri., deal.	18.25-18.75
Cleveland, rail	23.50-24.00
Eastern Pa., R. R.	22.50-23.00
Los Angeles	12.50
Pittsburgh, rail	25.00-25.50
St. Louis, R. R.	20.75-21.25

Ores

Lake Superior Iron Ore

Gross ton, 51¾%	
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	10.00
Foreign Ore	
Cents per unit, c.i.f. Atlantic ports	
Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos	nom.

Spanish, No. African basic, 50 to 60%	nom.
Chinese wolframite, net ton, duty pd.	\$23.50-24.00
Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c
F.O.B. Rio Janeiro.	
Scheelite, imp.	\$25.00
Chrome ore, Indian, 48% gross ton, cif.	\$28.00-30.00

Manganese Ore	
Including war risk but not duty, cents per unit cargo lots	
Caucasian, 50-52%	54.00-55.00
So. African, 50-52%	54.00
Indian, 49-50%	50.00
Brazilian, 46%	54.00
Cuban, 50-51%, duty free	67.50
Molybdenum	
Sulphide conc., lb., Mo. cont., mines	50.75

Sheets, Strip

Sheet & Strip Prices, Pages 92, 93

Pittsburgh—Operations continue to gain, with output over the past week slightly better than 80 per cent. Releases are active, and miscellaneous buying heavier than during the same period last month. Sellers report a slowing down in automotive buying, although other lines show the reverse, with smaller buyers still covering future needs as far as possible. Galvanized sheet output gained a point to 81 per cent of capacity, highest rate of recent years, while buying of narrow strip by miscellaneous manufacturers increased output on the smaller mills to slightly better than 70 per cent.

Cleveland—Deliveries are falling a little farther behind, with less flexibility on producers' order books than a week ago. More specifications are on steel urgently needed in comparison with merely building up inventories a few weeks ago. Sheet producers believe that first quarter prices will be announced by Nov. 15 and will be unchanged, such announcement to relieve pressure somewhat since then consumers will allow some December deliveries to be carried forward into 1941.

Chicago—Sheet and strip orders are in approximately the same volume as a week ago, but far ahead of the first week in October. Deliveries on most sizes are from five to twelve weeks. Orders going on books today are mostly for delivery early next year. Consumers have been purchasing far enough ahead to be assured of current needs and are now seeking protection beyond the present. Little business is attributed to national defense, but requirements for this purpose are increasing each week.

New York—Sheet deliveries continue fairly stable and do not appear quite as tight as a fortnight ago. Consumers find it easier to obtain deliveries within four weeks, although several large sellers are still unable to do anything under five to six weeks on either hot or cold-rolled sheets.

Philadelphia—Larger orders are appearing from some buyers attempting to protect themselves on forward needs. In some instances tonnage is offered at open prices for second quarter delivery though first quarter is the usual limit of future coverage. Mill backlogs are accumulating with five or six weeks generally the earliest delivery available on hot and cold-rolled.

Buffalo—With the defense program spurring forward coverage, a slight lengthening in delivery of sheets and strip is noted. Increased miscellaneous orders reflect the

quickenings of armament production.

Cincinnati—In each of the last four weeks the demand for sheets for defense requirements has increased until a considerable proportion of the tonnage is now earmarked for this purpose, increased allotments for Great Britain included. Priority for defense orders has not seriously pushed back other deliveries.

St. Louis—Despite heavy shipments, sheet and strip producers report mounting backlogs. Deliveries have been more stable than heretofore, though on certain items,

deliveries are further extended. One mill reports inquiries from territory which never before purchased here.

Birmingham, Ala.—Sheet output continues active. Tonnage is heavy, both in manufacturers' and roofing sheets, and because of pressure for delivery of heavier products, shipments are hardly keeping pace with bookings. Strip output is in moderate volume.

Toronto, Ont.—While mill representatives state that no sheets are available for spot delivery, contracts for early 1941 delivery are being taken and some is carried into



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TO THE PURCHASING AGENT
TO THE MAINTENANCE ENGINEER

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Cleveland, Ohio



second quarter. A substantial order is expected to develop from Ford Motor Co. of Canada, Windsor, which has received contracts for upwards of \$7,000,000 in war vehicles. General Motors also is placing large orders for sheets.

which indicates still heavier demand for plates from that source.

Cleveland—Wide and heavy plates, because of brisk shipbuilding demand, remain the most extended in delivery of heavy products for several companies. The situation shows no signs of being alleviated. It is thought that prices for first quarter delivery will soon be announced officially, with no change expected.

Plates

Plate Prices, Page 92

Pittsburgh—Tonnage continues to roll in. Backlogs remain high and output is at capacity on all mills. Railroad car buying is increasing,

Chicago — Plate orders maintain the pace of recent weeks as consumer demands show further strength. Car builders show principal activity as railroads are plac-

ing passenger and freight car orders more freely. On top of this, tank, boiler and heavy machinery fabricators are well booked and releasing orders steadily. Nine to eleven weeks is the current range for plate deliveries.

Boston — Plate deliveries are increasingly dependent on rolling schedules and are being extended on alloys and wider material. Tank plates are making the best relative showing. Demand is maintained, shipyard and miscellaneous specifications being outstanding. Drain on jobber stocks has been steady and releases are more frequent.

New York—Great Britain is inquiring for about 250,000 tons, including plates, bars and semifinished steel. It is also reported the same buyer is seeking a heavy tonnage of pig iron.

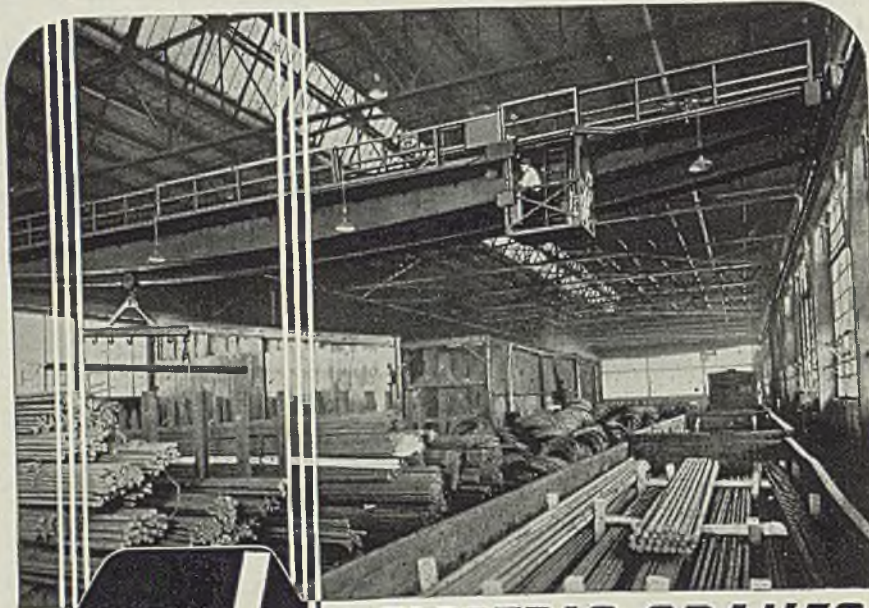
Philadelphia—Bookings hold near the volume of the past few weeks with backlogs increasing gradually. On some larger sizes producers ask six to eight weeks delivery though better shipment is available on lighter gages. Export buying is relatively slow. Railroad requirements are fair though trailing the volume of a year ago. Shipyard releases continue heavy.

Birmingham, Ala.—Plate production is being pushed to meet demand for shipbuilding, construction of cars and miscellaneous use. Some anxiety over deliveries is evident, especially if government priority is imposed.

Seattle — Demand for plates is strong and prices firm, shipbuilding plants in this area purchasing heavily. Puget Sound Machinery Depot, Seattle, has booked 2000 tons, 1500 tons for tanks and other equipment for the addition to the Aluminum Co. of America's plant at Vancouver, Wash., and 500 tons for tanks and digestors for the Puget Sound Pulp & Timber Co. plant, Bellingham, Wash.

San Francisco—On two mine layers, involving 960 tons, on which no bids were received, it is understood that they will be awarded on a negotiated contract with unstated interests. Awards totaled 960 tons and brought the aggregate for the year to 178,266 tons, compared with 89,806 tons for the same period a year ago. No new inquiries of size have developed of late.

Toronto, Ont. — Slowing in plate demand is reported, expected to be the forerunner of heavy orders when plans are completed for construction of large naval vessels and merchant ships planned for Canadian yards.



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Plate Contracts Placed

3000 tons, plant addition Aluminum Co. of America, Vancouver, Wash., to Puget Sound Machinery Depot, Seattle, and Steel Tank & Pipe Co., Portland. 1410 tons, ten coal barges, American

STEEL

Rolling Mill Co., Middletown, O., to St. Louis Shipbuilding & Steel Co., St. Louis.

500 tons, addition to plant of Puget Sound Pulp & Timber Co., Bellingham, Wash., to Puget Sound Machinery Depot, Seattle.

200 tons, standpipe, 1,025,000-gallon capacity, Fort Devens, Ayer, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

115 tons, 108 tanks, 6 x 6 feet, abrasives storage, Norton Co., Worcester, Mass., to Southbridge Roofing Co., Southbridge, Mass.

110 tons, tanks, International Filter Co., Brunswick, Ga., to R. D. Cole Mfg. Co., Newnan, Ga.

Plate Contracts Pending

Unstated, fuel storage tanks for coast guard base, Port Angeles, Wash.; bids not yet called.

Unstated, 500,000-gallon elevated steel tank for army air base, Anchorage, Alaska; bids in to quartermaster, Seattle.

Bars

Bar Prices, Page 92

Pittsburgh—New tonnage on bar mills makes it difficult for producers to meet needs of various bar consumers. Backlogs are mounting and producers here report buyers of bars for further processing, including cold-finished producers, have been placing heavier tonnages.

Cleveland — Heavy bars and rounds usually require six to eight weeks for delivery, with lighter weights six weeks. However, in several small bar sizes January or early February is the best delivery. Because of large orders on books rolls are changed infrequently, assuring economical operations.

Chicago — Orders for steel bars exceed production, with the result that backlogs are increasing and deliveries more extended. Delivery dates range from three to nine weeks, depending upon type and size. Chief demand is for alloy and carbon grades. Forge shops, one of the principal bar consumers, are booked to capacity for three months.

Boston — Bar consumers are endeavoring to add to protective orders and inventories, although the latter is difficult because of lengthening deliveries and increasing consumption. Warehouses are also seeking to fill gaps in stocks and cover further ahead. Buying for specific needs in connection with defense contracts is appearing. This is notably true of alloys and new inquiry includes several hundred tons for chain production and government shops.

New York — Bar backlogs continue to accumulate. Most sellers are now able to offer little tonnage for shipment this year. Alloy bar

deliveries now average around 15 weeks and where special heat treatment is necessary they extend well into second quarter. While some sellers of specially treated bars can still make shipments in about 26 to 30 weeks, others are sold ahead around 40 weeks.

Philadelphia — Merchant bar orders continue to exceed shipments. Some sizes can be delivered in about four weeks but as much as eight to ten weeks is required for heavier bars. Buyers are seeking additional protection ahead, finding active consumption preventing extensive accumulation of inventories.

Birmingham, Ala.—Consistent bar buying continues. Production is approximating 90 per cent, according to latest estimates, but demand for deliveries is not so marked as in some other items.

Toronto, Ont. — Merchant bar sales are well sustained, but bring no special pressure on production. Mills report supplies available late in December although inquiries are appearing for first quarter delivery. Demand is widely diversified, and there is specially good call for construction jobs.

Buffalo—Bar consumers are pushing forward buying to cover needs

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through first quarter. This has further congested the delivery situation and has built up order backlogs assuring mills capacity operations for months. Exports of bars to Canada are increasing but by far the largest portion of current output is going to domestic consumers.

Pipe

Pipe Prices, Page 93

Pittsburgh — Standard pipe demand continues heavy. Mechanical tubing shipments are maintaining

the high rate of October. New orders are heavy in pressure tubing, with railroad demand good. Oil country material is moving slowly, and line pipe tonnage demand is light.

Cleveland—Merchant pipe buying is active, with many inquiries and sales of small tonnages, bulking large. The coming of winter is not slackening the demand, government buildings such as cantonments affording an important outlet. The secondary and jobber markets are strengthening daily. Government orders for merchant pipe are considered less profitable than private.

Boston — Current buying of mer-

chant steel pipe for expedited defense requirements lifts sales somewhat above normal with prospects encouraging for sustained inquiry for construction work for some weeks. Pipe needs for housing projects are mounting although much pending tonnage will not be bought until after the first of the year. Resale prices are firmer in spots, but continue mixed and still soft at some points.

Seattle — Demand for cast iron pipe is improving and several projects are pending. General contracts have been placed by Seattle for two jobs involving 350 tons, bids were opened Nov. 7 for the Myrtle street improvement, 460 tons of 8 and 12 inch and bids have been called Nov. 14 for Twelfth avenue S. W., 180 tons of 12 and 16-inch.

San Francisco—Of special interest in the cast iron pipe market was award by Los Angeles of 2835 tons of 6, 8, and 12-inch pipe. Awards aggregated 3335 tons and brought the year's total to 42,040 tons, compared with 35,141 tons for the corresponding period in 1939. Carload and less than carload lots are numerous and distributors find it difficult to replenish stocks promptly.

Cast Pipe Placed

2835 tons, 6 to 12-inch, Los Angeles, allocated as follows; 1205 tons to United States Pipe & Foundry Co., Burlington, N. J., 925 tons to National Cast Iron Pipe Co., Birmingham, Ala. and 705 tons to American Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

460 tons, 8 and 12-inch, Myrtle street improvement, Seattle; bids in.
350 tons, two extension projects, Seattle; general contracts awarded.
200 tons, two Seattle extension projects, 8 and 16-inch; bids Nov. 14.
135 tons, two system projects, Everett, Wash.; bids in.

Wire

Wire Prices, Page 93

Pittsburgh — Steady buying by miscellaneous manufacturers continues to build up wire backlogs. Automotive buying is fairly good. Export orders are light in comparison with earlier months. Merchant market is active. Prices are steady on construction items and agricultural material.

Chicago — Wire and wire products continue in good demand as consumers maintain their production rates and see considerable more business in the offing. Backlogs are building up and deliveries becoming more extended.

Boston—Pressure for deliveries, notably specialties, adds to production difficulties with incoming business showing slight, if any, decline. Forward buying continues with ton-

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Electric Transfer Cars for Blast Furnaces and Steel
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Furnaces . . . Concentrate and Calcine Cars for
Copper Refineries . . . Automatic and Remote
Controlled Electric Cars . . . Pushers, Lev-
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ing Lorries, Coke Guides and Clay
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Engineers . . . Manufacturers

CLEVELAND, OHIO

nage slated for delivery next quarter at open prices somewhat heavier.

New York—Wire products orders are heavy, deliveries are lengthening and pressure for rope is notably severe. More tonnage is being booked for first quarter at open prices. This, with tonnage going over from fourth quarter assures high first quarter production. Nails continue in heavy volume. Rod demand is brisk, deliveries lengthening and supplies tight, though regular customers are being covered by most producers.

Birmingham, Ala.—Wire production is especially good in virtually all items, and there is an accumulation of tonnage likely to be carried over into first quarter.

Rails, Cars

Track Material Prices, Page 93

With 12,195 freight cars placed in October the total for ten months is 51,492, compared with 55,090 in the same period last year. Total for all 1939 was 57,775 cars and it seems probable this number will be exceeded this year, as railroads are placing orders with regularity. October purchases were the largest this year. Comparisons follow:

	1940	1939	1938	1937
Jan.	360	3	25	17,806
Feb.	1,147	2,259	109	4,972
March	3,104	800	680	8,155
April	2,077	3,095	15	9,772
May	2,010	2,051	6,014	4,732
June	7,475	1,324	1,178	548
July	5,846	110	0	1,030
Aug.	7,525	2,814	182	1,475
Sept.	9,735	23,000	1,750	1,216
Oct.	12,195	19,634	2,537	1,355
10 mos.	51,497	55,090	12,490	51,061
Nov. ....	.....	2,650	1,232	275
Dec. ....	.....	35	2,581	275
Total ..	.....	57,775	16,303	51,611

Substantial purchases of locomotives have been made recently for export to Brazil. The ministry of public works has closed on 26 locomotives, divided between two builders, and the state of Sao Paulo has placed 20 electric passenger and freight locomotives and four three-coach multiple-unit trains. Export-Import bank is understood to have assisted in financing these purchases.

Wheeling & Lake Erie is inquiring for 3000 tons of rails and accessories. It will also repair in its own shops an unstated number of cars.

Locomotives Placed

Ministry of Public Works, Brazil, 26 locomotives, 13 to Baldwin Locomotive Works, Edylstone, Pa., and 13 to American Locomotive Co., New York.

Southern, five diesel-electric, to Electro Motive Corp., La Grange, Ill., pending purchase authority.

State of Sao Paulo, Brazil, 20 electric passenger freight locomotives, to Elec-

trical Export Corp., a joint subsidiary of General Electric Co., Schenectady, N. Y. and Westinghouse Electric Mfg. Co., Pittsburgh.

Car Orders Placed

Chief of engineers, army, Washington, 20 steel-sheathed 40-foot box cars to General American Transportation Corp., Chicago, and four 40-foot flat cars to Haffner-Thrail Co., Chicago, bids Oct. 24, pro. 115.

Denver & Rio Grande Western, 20 freight cars, to own shops.

Lehigh & New England, 300 fifty-ton hopper cars, to Pressed Steel Car Co., Pittsburgh.

Navy, 15 fifty-ton flat cars, to American Car & Foundry Co., New York.

Southern, 44 passenger cars, to Pullman-Standard Car Mfg. Co., Chicago, pend-

ing purchase authority.

State of Sao Paulo, Brazil, four 3-coach multiple unit trains, to Electrical Export Corp., joint subsidiary of General Electric Co., Schenectady, N. Y. and Westinghouse Electric & Mfg. Co., Pittsburgh.

Rail Orders Placed

Missouri Pacific, 31,750 tons; 10,680 tons to Carnegie-Illinois Steel Corp., Chicago; 9230 tons to Colorado Fuel & Iron Corp., Denver; 5025 tons to Inland Steel Co., Chicago; 5915 tons to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; 900 tons to Bethlehem Steel Co.

Car Orders Pending

Bessemer & Lake Erie, 650 hoppers, 300

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CHALLENGE SEMI-STEEL LAPPING PLATE

For accurate lapping of joints required to hold oil, this Challenge Lapping Plate is highly recommended. It is specifically designed to assure a perfect fit when lapping metal-to-metal joints on which no sealer of any kind is used. Made of finest semi-steel, specially heat-treated and

machined, this plate has $\frac{1}{16}$ " grooves, $\frac{1}{2}$ " apart, running the full length and width of the surface. The Challenge Lapping Plate is available with or without an all-steel, arc-welded stand, equipped with lock leveling screws to keep the plate absolutely level. Ask for sizes and prices.

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box cars, 50 flat cars.
 Duluth, Missabi & Iron Range, 100 gondolas, inquiry revived.
 Elgin, Joliet & Eastern, 500 gondolas, 250 hoppers.
 New York Central, 25 coaches; bids Nov. 27.
 Norfolk Southern, 250 box, 50 gondolas, 50 hoppers; bids asked.
 Northern Pacific, 1000 cars.
 Pacific Fruit Express, 1000 cars.

Rail Orders Pending

New York, New Haven & Hartford, 10,000 tons of rail and accessories, court permission granted.

Buses Pending

Missouri Pacific Transportation Co., subsidiary of the Missouri Pacific, six 37-passenger, air conditioned, diesel-propelled busses.

Shapes

Structural Shape Prices, Page 92

Pittsburgh — Considerable shape tonnage is being placed for first quarter delivery and beyond. It is almost impossible to secure delivery on substantial tonnages for the balance of this quarter. Tonnage for delivery in 1941 is being taken at prices in effect at that time.

Cleveland — Deliveries on wide flange shapes are running 6 to 8 weeks, with 4 to 6 weeks on standard sections. The largest new structural project involves about 3000 tons eventually for a plant exten-

sion for the Cleveland Graphite Bronze Co., and Lima Locomotive works will need 1530 tons for four new buildings.

Chicago — Structural fabricators report more jobs out for figuring, although at the moment government projects practically dominate the situation, particularly in size. Most inquiries are in territory outside of Chicago proper. Awards for steel piling remained good.

Boston — Structural steel inquiry continues in good volume, contracts for defense construction and industrial expansions contributing tonnage. Current awards are temporarily lower, but volume being figured is maintained. District fabricating shops have larger backlogs almost without exception. Plain material deliveries have lengthened further and beyond eight weeks in some cases.

New York — Contracts are fewer with tonnage placed lowest in several weeks. Bridge lettings include 750 tons but pending volume is light. Award of 32,000 tons for overhead runways for dry docks at Philadelphia and Norfolk, Va., are held up pending increase in budget for material.

Philadelphia — Structural orders are sustained, including a number of small lots. Several large tonnages are pending for defense projects though most major jobs of this character here are now placed. Plain shape deliveries are at six to eight weeks.

San Francisco — The structural market was active and 10,314 tons were booked.

Toronto, Ont. — Building activities continue heavy and indicate structural steel orders pending of approximately 10,000 tons. Fabricators report full time operations and are importing structural steel from the United States at upwards of 9000 tons per month, while Canadian mills also are heavily engaged.

Shape Contracts Placed

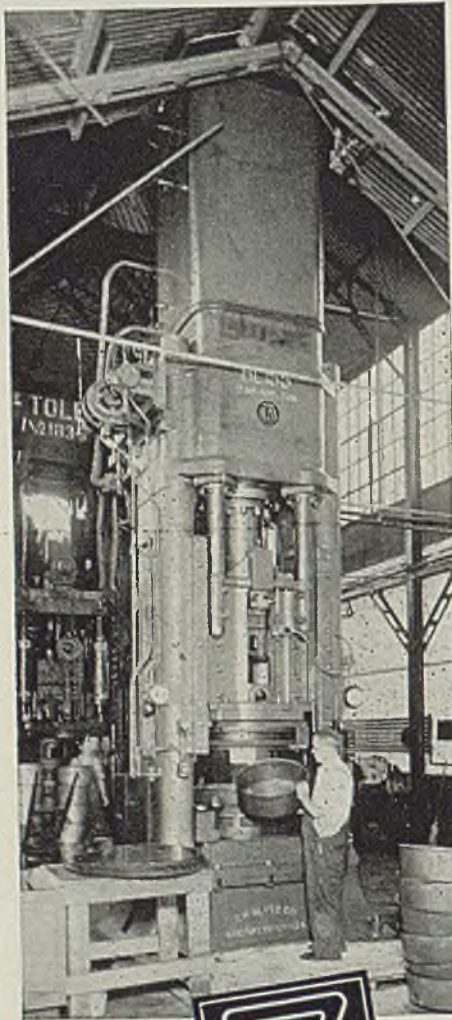
2715 tons, three army hangars, Elmendorf field, Anchorage, Alaska, reported to Bethlehem Steel Co., San Francisco.
 2000 tons, naval gun mount and machinery plant, Northern Pump Co., Min-

Shape Awards Compared

	Tons
Week ended Nov. 9	28,000
Week ended Nov. 2	37,890
Week ended Oct. 26	69,875
This week, 1939	25,105
Weekly average, year, 1940	28,372
Weekly average, 1939	22,411
Weekly average, Oct.	48,298
Total to date, 1939	1,024,909
Total to date, 1940	1,276,756

Includes awards of 100 tons or more.

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Whatever your needs for flat-rolled stainless, ARMCO can meet them. Brilliant finishes or finishes of a rich, satiny texture; corrosion and heat-resisting grades for harrowing jobs. Moreover, you are assured of the kind of forming, working, drawing and welding performance that helps boost operating profits.

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ARMCO

STAINLESS STEELS

neapolis, to American Bridge Co., Pittsburgh; G. F. Cook Construction Co., Minneapolis, contractor.

1370 tons, trestle, Caddoa, Colo., to Consolidated Steel Co., Los Angeles.

1000 tons, trestle, Caddoa dam, Caddoa, Colo., to Consolidated Steel Corp., Los Angeles.

975 tons, Spokane river bridge, Stevens Lincoln counties, Washington, for state, to Lakeside Bridge & Steel Co., Milwaukee.

945 tons, state highway, Wisconsin, Durand, Wis., to Worden Allen Co., Chicago.

920 tons, bridge, pro. 6310, Peplin county, Wisconsin, to Worden-Allen Co., Milwaukee.

900 tons, double hangar, invitation 6812-41-14, Hickam Field, T. H., to Minneapolis-Moline Power Implement Co., Minneapolis.

845 tons, addition, Reeves avenue power station, Norfolk, Va., to Lehig Structural Steel Co., Allentown, Pa.

800 tons, warehouse Plectinny arsenal, Dover, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa., through John Lowry Inc., New York.

775 tons, Twelfth street bridge, Kansas City, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

775 tons, buildings, Aluminum Co. of America, Lafayette, Ind., to Indiana Bridge Co., Muncie, Ind.

765 tons, three hangars, one, San Angelo, Tex., and two, Ellington Field, Texas, to Mosher Steel Co., Dallas, Tex.

750 tons, grade crossing elimination, Schenectady county, New York, to American Bridge Co., Pittsburgh, through Fred Berlant & Son, Inc., Harrison, N. Y.

660 tons, building, Rhinelander Paper Co., Rhinelander, Wis., to Wisconsin Bridge & Iron Co., Milwaukee.

585 tons, forge shop, Harvey, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

575 tons, field engine repair shop, Hill field, Ogden, Utah, to Duffin Iron Works, Chicago.

530 tons, trash racks, spec. 1424, bureau of reclamation, Texas project, to Stupp Bros. Bridge & Iron Co., St. Louis.

530 tons, two government aircorps hangars, Ellington field, Olcott, Tex., to Mosher Steel Co., Houston, Tex.; bids Oct. 25.

487 tons, engine repair shop, invitation 6812-41-9, Hickam Field, T. H., to Consolidated Steel Corp., Los Angeles.

425 tons, shop building, General Electric Co., Lynn, Mass., to American Bridge Co., Pittsburgh.

380 tons, building, Wallace Laboratories, Jersey City, N. J., to Ingalls Iron Works, Pittsburgh.

350 tons, plant addition, Autocar Co., Ardmore, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, bridge over Spoon river, Seville, Ill., for Toledo, Peoria & Western railroad, to American Bridge Co., Pittsburgh.

350 tons, addition to building No. 9, Aluminum Co. of America, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

350 tons, buildings, New England Baptist hospital, Roxbury district, Boston, to Bethlehem Fabricators Inc. through Waghorne-Brown Co., Boston; McCuecheon Co., Boston, contractor. Concrete Steel Co., Boston, awarded contract for reinforcing bars.

325 tons, coal handling plant, Waterside station, Consolidated Edison Corp., New York, to American Bridge Co., Pittsburgh.

308 tons, administration, cafeteria and heating plant, specification 9973, naval

supply depot, Oakland, Calif., to Independent Iron Works, Oakland, Calif.

300 tons, store building, Sears Roebuck Co., Decatur, Ill., to Midland Structural Steel Co., Cicero, Ill.

200 tons, foundry building, Foster-Wheeler Corp., Carteret, N. J., to Jones & Laughlin Steel Corp., Pittsburgh, through Wighton-Abbott Co., New York.

275 tons, addition, Byson Jackson Co., Los Angeles, to Bethlehem Steel Co., Los Angeles.

265 tons, aircorps hangar, advanced flying field, war department, San Angelo, Tex., to Mosher Steel Co., Houston, Tex.; bids Oct. 25.

250 tons, warehouse for Sears, Roebuck & Co. in St. Louis, to Mississippi Valley Structural Steel Co., St. Louis, through

Fruin-Conlon Contracting Co., St. Louis.

249 tons, shapes and steel piling, highway bridge work for Texas state highway department, to North Texas Iron & Steel Co., Fort Worth, Tex.

245 tons, Poplar housing project, Philadelphia, to Empire City Iron Works, Philadelphia.

245 tons, barracks building, naval research laboratory, Bellevue, D. C., to Pittsburgh-Des Moines Steel Co., Pittsburgh; C. H. Tompkins Co., Washington, contractor.

225 tons, deck slab supports, Wilputte Coke Oven Corp., Lackawanna, N. Y., to Lackawanna Steel Construction Co., Buffalo.

215 tons, garage, General Electric Co., Lynn, Mass., to American Bridge Co., Pittsburgh.

205 tons, structural steel rail support

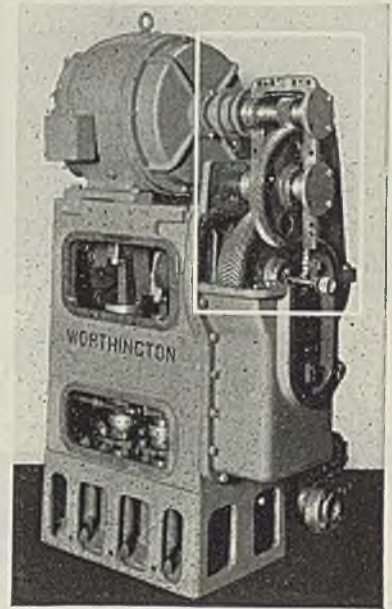
FARREL-SYKES GEARS

Assure Extra Dependability in Worthington Marine Pumps

Because marine duty requires equipment that will stand up in continuous service without failure, Worthington use Farrel-Sykes Gears to drive their vertical triplex plunger boiler feed pump here illustrated.

In addition to dependable performance they get all the other advantages inherent in Farrel-Sykes Gears. Precision generation by the famous Sykes process makes these gears exceptionally quiet and smooth-running. The continuous herringbone teeth provide more bearing surface and extra strength which reduce tooth stresses and increase load-carrying capacity. Thus, it is often possible to use herringbone gears of smaller size with resultant savings in weight, space and cost.

The combined characteristics of overlap or interlacing of the teeth, creeping engagement and inclined line of pressure reduce wear and maintain the involute profile and correct tooth action throughout the life of the gears. Increased life, continuous operating efficiency and maintenance economy are thus secured.



Farrel-Sykes Herringbone Gears are used in this Vertical Triplex Plunger Boiler Feed Pump built by Worthington Pump and Machinery Corp., Harrison, N. J.

FARREL-SYKES GEARS AND GEAR UNITS ARE MADE FOR ANY CAPACITY AND FOR EVERY TYPE OF SERVICE. WHEN YOU HAVE A GEAR PROBLEM FARREL ENGINEERS WILL WORK WITH YOU TO FIND THE ANSWER.



FARREL - BIRMINGHAM COMPANY, Inc.
322 VULCAN STREET - - - - - BUFFALO, N. Y.

The Gear with a Backbone

towers, req. 226353, Tennessee valley authority, Watts Bar Dam project, to Hunter Steel Co., Pittsburgh, bids Oct. 14; Inland Steel Co., Chicago, awarded steel piling, req. 240832, Kentucky dam, opening same date.

200 tons, telephone building, Newport News, Va., to Lehigh Structural Steel Co., Allentown, Pa.

200 tons, English Woods housing project, Cincinnati, to Jones & Laughlin Steel Corp., Pittsburgh; J. & E. Warm Co., Cincinnati, contractor.

197 tons, sheet piling, treasury department, invitation 10789, Los Angeles, to Columbia Steel Co., San Francisco.

195 tons, reactor building, Union Oil Co., Oleum, Calif., to Consolidated Steel Corp., Los Angeles.

190 tons, abrasives storage building, Norton Co., Worcester, Mass., to United

Structural Steel Co., Worcester, Mass.

190 tons, state highway bridge, RC-40-86, Delhi-Andes highway 982, Delaware county, New York, to Lackawanna Steel Construction Co., Buffalo; Denzie B. Riggs, Troy, N. Y., contractor, \$94,166.60; bids Oct. 16, Albany.

185 tons, building 18, Hilton-Davis Chemical Co., Cincinnati, to Joseph T. Ryerson & Son Inc., Chicago.

185 tons, bridge FAP-800-F (1), Llano county, Texas, to Peden Iron & Steel Co., Raleigh, N. C.

165 tons, central heating plant, quarter-master depot, Jefferson, Ind., to A. E. Anderson Iron Works, Chicago, through C. A. Hopper & Co., Madison, Wis.; bars to Bethlehem Steel Co., Bethlehem, Pa.

140 tons, radio tower, New Rochelle, N. Y., to Pittsburgh-Des Moines Steel

Co., Pittsburgh.

125 tons, gate frames, specification 1347-D, Earp, Calif., to Valley Iron Works, Denver, Colo.

124 tons, structurals and steel piling, highway bridge work for Texas highway department, to North Texas Iron & Steel Co., Fort Worth, Tex.; also 2500 feet bridge railing.

120 tons, warehouse for Ryan Aircraft Co., San Diego, Calif., to National Iron Works, San Diego, Calif.

115 tons, bus terminal, Greyhound, Syracuse, N. Y., to Syracuse Engineering Co., Syracuse.

115 tons, Blue river bridge, Grant county, Wisconsin, to Midland Structural Steel Co., Cicero, Ill.

115 tons, storehouse No. 303, Frankford arsenal, Philadelphia, to F. M. Weaver & Co. Inc., Lansdale, Pa.

110 tons, service building, Gar Wood Industries Inc., Detroit, to R. C. Mahon Co., Detroit.

110 tons, storage plant, Dow & Co., Buffalo, to R. S. McMannus Steel Construction Co., Buffalo.

105 tons, state bridge, Spokane county, Washington, to Pacific Car & Foundry Co., Seattle; C. A. Powers, Spokane, general contractor.

100 tons or more, housing project, Rock Island, Ill., to Bethlehem Steel Co., Bethlehem, Pa., and Rock Island Bridge & Iron Works, Rock Island; Lovering Construction Co., St. Paul, Minn., contractor.

Shape Contracts Pending

6000 tons, transmission towers between Grand Coulee dam and Covington, Wash.; bids Nov. 25.

5000 tons, 1941 bridge requirements, various locations, Chicago, Rock Island & Pacific railway.

1530 tons, four buildings, Lima Locomotive works, Lima, O.

1500 tons, electric shop, administration building, steam test plant and facilities building, Mare Island, Calif.; bids soon.

1300 tons, munitions filling plant, Edgewood, Md., for government.

1100 tons, order and stores building, General Electric Co., Schenectady, N. Y.

1000 tons, manufacturing building and boiler house, Kelsey-Hayes Wheel Co., Plymouth, Mich.

700 tons, plant, Houde Engineering Co., Cheektowaga, N. Y.

700 tons, factory building, Bendix-Westinghouse Automotive Parts Co., Elyria, O., through Argonaut Realty Co., Detroit; bids Nov. 7.

500 tons or more, materials for six substations in Oregon and Washington for Bonneville project; Bethlehem Steel Co., Seattle, low.

500 tons, 3000 tons eventually, plant extension, Cleveland Graphite Bronze Co., Cleveland, costing \$4,000,000, including equipment; bids soon.

450 tons, library building, Rutgers university, New Brunswick, N. J.

425 tons, warehouses A and B, Pocatiny arsenal, Dover, N. J.

375 tons, black powder building, etc., Dover, N. J.

325 tons, wire mill warehouse, Republic Steel Corp., South Chicago, Ill.

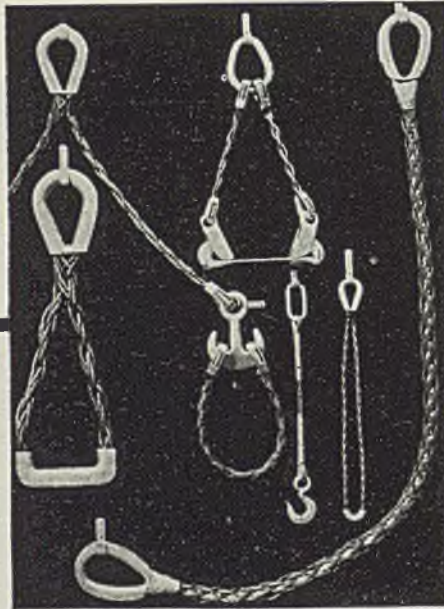
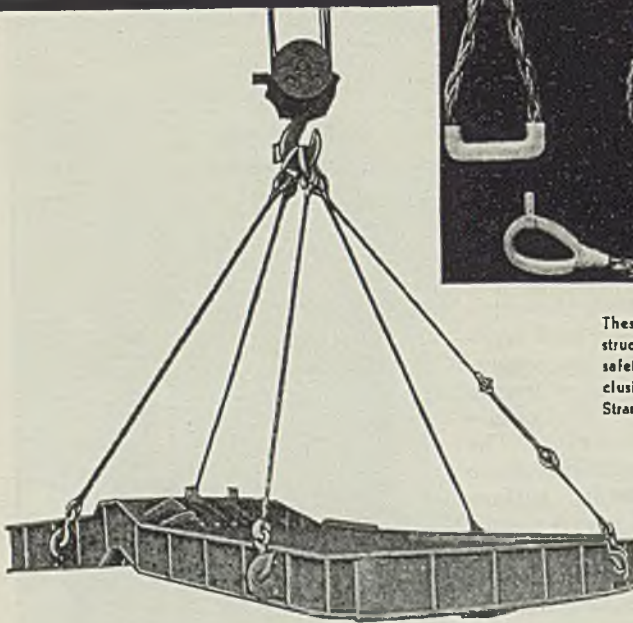
300 tons, air corps hangar, Camp Edwards, Falmouth, Mass.

300 tons, storehouse, Frankford arsenal, Philadelphia; Frank M. Weaver Co., Lansdale, Pa., contractor.

250 tons, plastic manufacturing building, Inland Mfg. division, General Motors Corp., Dayton, O.

240 tons, manufacturing building, Rheem Mfg. Co., Baltimore.

SLINGS for all sorts of LOADS



These and many other constructions and types of braided safety slings are now made exclusively of genuine Yellow Strand Rope.

Try Yellow Strand Plaited Safety Slings for handling "problem" loads in steel mill and foundry—irregular castings, steel rolls, huge transformers, etc. No shifting or slipping, no marring of highly finished steel—and no load too heavy—for these amazingly flexible, soft, kink-resistant and durable slings.

All plaited safety slings made under the original Murray Patents* are now manufactured by our company, exclusively, and only genuine Yellow Strand is used—the rope unsurpassed in quality and stamina.

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Broderick & Bascom Rope Co., St. Louis

Branches: New York, Chicago, Seattle, Portland, Houston

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Yellow Strand Plaited Safety Slings

* Murray Patents: U. S. Patents 1475859, 1524671; Canadian Patents 252874, 256058.

FREE RIGGERS' HAND BOOK

Contains full data on Plaited Safety Slings, standard Yellow Strand Slings, fittings, etc. No charge, of course.

220 tons, building, St. Helena's church, Bronx, New York.
 200 tons, state bridge, Table Rock, Nebr.
 200 tons, administration building, Frankford arsenal, Philadelphia.
 190 tons, office building, Colt Mfg. Co., Hartford, Conn.
 185 tons, state bridge, Butler county, Ohio.
 180 tons, plant addition, United States Plywood Corp., Philadelphia.
 180 tons, underpass, Butler county, Pennsylvania, for state.
 175 tons, factory addition, Ingersoll Rand Co., Painted Post, N. Y.
 175 tons, department of public works, Chicago, including bins, railings, etc., for Roseland pumping station, West 104th street and South Stewart avenue; bids Nov. 14.
 150 tons, highway bridge, Corfu, N. Y., rebid Nov. 27.
 140 tons, highway bridge, Genesee County, N. Y.
 123 tons, Washington state projects; bids at Olympia Nov. 19.
 120 tons, shipway caisson gate, New York Shipbuilding Corp., Camden, N. J.
 100 tons, Moencopi Wash bridge, Flagstaff, Ariz., department of interior.
 100 tons, shapes and bars, covered bridge, Little Androsoggin river, Oxford, Me.; bids Nov. 13, Augusta.
 Unstated, Oregon state steel bridge Lincoln county; bids to Portland, Nov. 12.
 Unstated, three sets crane carriage frames for Coulee dam; Valley Iron Works, Yakima, Wash., low to Denver.
 Unstated, electric bridge crane for Puget Sound navy yard; bids to Washington, Nov. 13.

tion work for the shell loading plant at Ravenna, O., is being figured informally, with tonnages not yet stated.

Chicago — Reinforcing bar buying continues good with numerous jobs coming out. In addition to this, there are numerous jobs involving small tonnages up to 100 tons. Government projects account for most large projects.

Boston — Housing requirements, several thousand tons for projects bid or figured to the general contract stage, feature pending reinforcing bar demand. Concrete bar prices are generally firm, but lengthening deliveries give more

concern, distributors filling some orders from both stock and direct mill shipments.

New York — Concrete bar purchases were led by letting of close to 6000 tons for defense work at Coco Solo, Panama, and Guantánamo, Cuba, placed with several distributors by two New York contractors. Deliveries on current orders range from five to six weeks.

Philadelphia — Reinforcing bar orders are mostly small but heavy tonnage is involved in work scheduled for bids in the near future. Prices are generally steady on the majority of jobs.

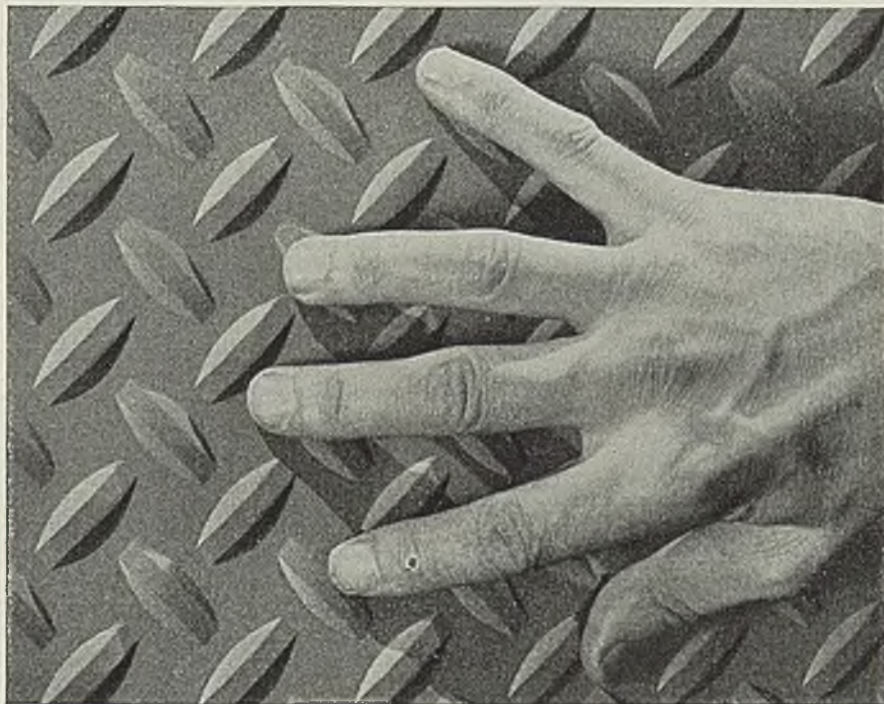
Seattle — Mills are operating at

Reinforcing

Reinforcing Bar Prices, Page 93

Pittsburgh — Prices in most sections of the country are better, particularly in the Middle West. Tonnage is heavy and deliveries are running behind. Mills are faced with heavy backlogs and in many cases are unable to meet current delivery demand. On any substantial tonnage inquiry which demands immediate delivery, earliest possible date runs from 45 to 65 days.

Cleveland — Though reinforcing bars for three weeks have been reported as on the point of strengthening, little progress has been made, with concessions still prevalent. Though there are many small tonnage projects in this area, those of 100 tons or more are few. Founda-



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INLAND STEEL CO., 38 SOUTH DEARBORN STREET, CHICAGO, ILLINOIS

SHEETS • STRIP • TIN PLATE • BARS • PLATES • FLOOR PLATES
 STRUCTURALS • PILING • RAILS • TRACK ACCESSORIES • REINFORCING BARS

INLAND 4-WAY FLOOR PLATE

Concrete Bars Compared

	Tons
Week ended Nov. 9	6,344
Week ended Nov. 2	10,936
Week ended Oct. 26	9,838
This week, 1939	8,712
Weekly average, year, 1940	9,620
Weekly average, 1939	9,197
Weekly average, Oct.	12,417
Total to date, 1939	445,316
Total to date, 1940	432,890

Includes awards of 100 tons or more.

capacity, both large and small awards being noted, the latter aggregating a considerable tonnage. Lettings include 1650 tons to Bethlehem Steel Co., Seattle, including 1000 tons for the Boeing airplane plant addition and 200 tons to Northwest Steel Rolling Mills, involved in a number of small jobs.

San Francisco—While numerous lots of less than 100 tons are being booked few larger lettings have been reported. Pending business is light and does not exceed 8000 tons.

Reinforcing Steel Awards

- 2000 tons, sewer project, Queens, New York, to Igoe Bros., Newark, N. J.
- 1000 tons, Boeing airplane plant addition, Seattle, to Bethlehem Steel Co., Seattle; Austin Co. general contractor.
- 425 tons, factory building, Eastman Kodak Co., Rochester, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; A. W. Hopeman & Sons Co., Rochester, contractor.
- 400 tons, Quinlplace housing project, New Haven, Conn., to Buffalo Steel Co., Buffalo, through W. A. Connors Co., Hartford, Conn.
- 310 tons, housing project, Jackson, Tenn., to Virginia Steel Co., Birmingham, Ala.; Algernon Blair, Montgomery, Ala., contractor; Decatur Iron & Steel Co., Decatur, Ala., awarded small tonnage, structural steel.
- 300 tons, mesh, highway contracts 4019 and 4013, Rhode Island, to Wickwire Spencer Steel Co., New York, through M. A. Gammino Construction Co., Providence, R. I.; bars to Concrete Steel Co., New York.
- 225 tons, highway bridge work for Texas state highway department, to North Texas Iron & Steel Co., Fort Worth, Tex.
- 220 tons, Lakeview addition, Illinois Bell Telephone Co., Chicago, to Concrete Steel Co., Chicago.
- 200 tons, various building and construction projects, to Northwest Steel Rolling Mills, Seattle.
- 200 tons, various small building jobs, to Bethlehem Steel Co., Seattle.
- 200 tons, Fort Lewis, Wash., cantonment, to Bethlehem Steel Co., Seattle; Sound Construction & Engineering Co., Seattle, general contractor.
- 200 tons, engine test building and spray pool, southeast air depot, Mobile, Ala., to Ceco Steel Products Co., Birmingham, Ala.; E. & E. J. Pfozter, Pensacola, Fla., contractor.
- 200 tons, naval gun mount and machinery plant, Northern Pump Co., Minneapolis, to Truscon Steel Co., Youngstown, O.; G. F. Cook Construction Co., Minneapolis, contractor.
- 150 tons, Seattle transportation commission garage and shops, to Bethlehem Steel Co., Seattle; Garde Construction Co., Seattle, general contractor.
- 100 tons, Farmers' Exchange, Concord, N. H., to Concrete Steel Co., Boston.
- 100 tons, rare book library, Harvard University, Cambridge, Mass., to Northern Steel Co., Boston.

Reinforcing Steel Pending

- 550 tons, housing project, Newport, R. I.; E. Turgeon, Providence, R. I., low, \$931,861, bids Nov. 1. Newport housing authority.
- 500 tons, veterans hospital near Marion, Ill.; Ring Construction Co., Minneapolis, general contractor.
- 360 tons, Washington state bridge, Yakima county; bids at Olympia, Nov. 19.

360 tons, Washington state bridges in King and Spokane counties; bids at Olympia, Nov. 19.

220 tons, naval reserve armory, Seattle; bids to state director, Olympia, soon; B. M. Priteca, Seattle, architect.

200 tons, psychiatric hospital, Sisters of Mercy, Hammond, Ind.; Walter Butler Co., St. Paul, contractor.

170 tons, highway project 312, Clinton county, Ohio; A. W. Burns Construction Co., Columbus, O., low bidder.

114 tons, Ellsworth Durand road, Wisconsin, to Bethlehem Steel Co., Bethlehem, Pa.

Unstated tonnage, foundation work, shell loading plant, Ravenna, O.; bids Nov. 7.

Pig Iron

Pig Iron Prices, Page 94

Pittsburgh — Price situation has apparently quieted considerably, with no other producers following the increase made by Pittsburgh Coke & Iron Co. There has been no change in the coke situation, although several interests have indicated they will light additional ovens if prices increase sufficiently for first quarter delivery.

Cleveland — Pig iron buying is light but specifications are brisk. Some producers have made no sale in ten days. Consumers are covered for the rest of the year and may not buy concertedly again until books are opened for first quarter about Dec. 1. In many instances foundrymen are compelled to take slightly different analyses from usual because of less variety to choose from.

Chicago — Little change is noted in merchant pig iron. Requirements are at a pace causing suppliers to operate at full capacity. Shipments are taking care of current requirements, which are increasing weekly. Gray iron and malleable foundries, while melting below peak capacity, are working at a comfortable rate; steel foundries are fully engaged and will be for some time. Situation for foundry coke is considerably tighter than for iron, and shipments are running behind schedule.

Boston — Pig iron shipments are active and inquiry maintained. Consumers are releasing steadily against fourth quarter contracts, but producers are reluctant to cover even regular customers beyond the end of the year. Demand is brisk for practically all grades, notably malleable. Foundry melt continues to gain momentum with the demands on merchant furnaces mounting, although steelworks producers are covering regular customers.

New York — Pig iron specifications are at possibly the highest level this year, according to sellers. While the machine tool industry is taking the heaviest tonnage, as has been generally the case for a

month, demand is becoming increasingly diversified. Most consumers are covered by contracts, but there are more new orders than producers are willing to accept. Sellers are endeavoring to take care of the legitimate requirements of their own customers, but appear unwilling to go any further.

Due largely to this reason export inquiry is receiving relatively scant attention, with the large tonnage now pending for Japan, a case in point.

Philadelphia — Shipments are brisk as consumers draw freely against contracts in expectation of heavy requirements and no excess in iron supplies the next several months. Interest in first quarter orders is only moderate but shipments against a portion of previous commitments will extend into that period. The belief is growing that prices will continue unchanged the remainder of this quarter if not into next year. Foundry operations are somewhat spotty but gaining gradually.

Cincinnati — Pig iron shipments show steady expansion, with furnaces acting to discourage speculation. Orders for southern iron are subject to furnace confirmation and some business, with other than regular customers, was reported rejected. Armco will light a rebuilt blast furnace Nov. 15. Prices on by-product foundry coke were reaffirmed for November.

St. Louis — Pig iron shipments continue on an extensive scale, and sellers believe the movement in November will equal its predecessor, which was the highest recorded this year. There is some scattered buying, but for the most part melters are supplied for balance of quarter, and many well into next year. The melt as a whole is at the highest point since 1937, with virtually all classes of users participating in the up-trend.

Toronto, Ont. — Pig iron demand is increasing and some melters are beginning to worry about 1941 supply. One Ontario producer has withdrawn from the market. Difficulty in obtaining certain lines of iron scrap is stimulating pig iron sales. Basic iron now accounts for turnover of about 1000 tons weekly.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 93

New York — Bolt and nut business here is the most active since the first quarter of 1937, with eastern manufacturers operating over 85 per cent. Deliveries range two to three weeks, but with buying still expanding, bolt and nut schedules are expected to broaden further, especially with mill shipments on bars steadily increasing.

Scrap

Scrap Prices, Page 96

Pittsburgh — Early railroad list closings indicate slightly higher prices are being paid for heavy melting steel and specialties. Over the past week several sales have been made in open-hearth grades at the quoted levels, while cast grades have shown stronger prices and new purchases have been made at better levels.

Cleveland — Scrap market continues to mark time, awaiting outcome of bids on railroad lists. Shipments on contracts continue heavy but buying is confined to small lots of miscellaneous grades. Prices are firm and unchanged.

Chicago — Only scrap purchases by brokers were against current contracts and these were small. Mills have done no buying recently. In spite of this, the market has a strong undertone with brokers paying mostly \$19.75 and in some instances as high as \$20 for No. 1 heavy melting steel. Dealers appear well supplied but show little disposition to move it out. Mills are working out of inventories as current melting requirements exceed incoming contract shipments.

Boston — On sales to eastern Pennsylvania and New England, cast grades are slightly stronger. Both grades of machinery cast and heavy breakable are up 25 to 50 cents for New England delivery, while stove plate and skeleton also have a firmer tone. Export activity is slow, but a sale of about 35,000 tons of heavy melting steel for barge shipment to the Baltimore district has maintained prices, No. 2 being slightly firmer.

New York — Shipments of heavy melting steel are active, with buying at firm but generally unchanged prices. No. 1 heavy melting steel brings \$16.50 on cars and considerable material accumulated for export is being diverted to domestic consumers in eastern Pennsylvania. Foundry grades are also more active. Export movement is at a standstill, due to lack of boats.

Buffalo — On the basis of small sales, aggregating 4000 tons, prices on steelmaking grades were advanced 50 cents a ton with No. 1 heavy melting steel quoted at \$20.50 to \$21. A bid for large tonnage 50 cents below this range is being passed up as dealers' yards are reported paying \$19.50 to \$20 a ton for No. 1 material. Heavy boat shipments have been helping mills build up stockpiles.

Philadelphia — Scrap continues active at generally unchanged prices. In some cases, notably cast grades, supplies are tighter but heavy melting steel is coming out in sufficient volume to meet heavy

requirements on contracts. Mill stocks are moderate in relation to consumption and interest in acquiring additional supplies is seen likely to absorb what scrap backs up as a result of lighter exports. Scarcity of vessels is an important factor in retarding buying for export. Some scrap previously accumulated at a New England port is understood moving by barge to a lower seaboard mill.

Detroit — Despite the fact the largest local consumer of scrap has been out of the market for the past week, ostensibly in the belief present prices are too high, sellers here seem disinclined to readjust

quotations downward, some taking orders for water shipment, even though this involves rush shipments of material to docks.

Cincinnati — Iron and steel scrap prices appear fairly well stabilized, although quotations on No. 1 heavy melting steel go up 50 cents on an adjustment. Wanted grades are scarce and some interests contend an increase in price may be required to augment flow of material. The market is active, with less speculation than in recent months.

St. Louis — The market for iron and steel scrap has been marking time. There have been some purchases of small lots of special ma-



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Behind the Scenes with STEEL

Good Advice

■ "Buying cheap merchandise to save money," says D. Walter Allard, "is like stopping a clock to save time." He's right. We tried it on our clock this morning and missed the last train to town by a half hour.

Tell It To Sweeney Dept.

■ Many metalworking plants have at least two bulletin boards—one for the Wagner Act, the other for the management. The other day we saw a large placard on one of these boards announcing the taxing of members by the "Committee", at \$1.00 per head, to remove the "miserable conditions at the Ford plants". One of the boys had underlined "miserable", and in the margin had scribbled a big question mark. Seems he must have once worked for Mr. Ford.

Oh You Kid

■ Along with his renewal for another two years of the industry's top paper J. N. Cutrone, Jr., inquires if he may purchase some Christmas greeting cards from the Penton Publishing Co. Maybe, he says, we have something as cunning and humorous as Shrdlu. We're sorry to say we aren't in the Xmas card business but happy to report that there are several things much more cunning and more genuinely humorous than ourselves around the shop. Particularly that new gal with the languid eyes.

Draftsmen Wanted

■ Here may be one reason for a few of the production bottlenecks in the defense program. They tell us that a light tank requires 2500 scale drawings and a battleship a mere thirty tons of blue prints. And also that an airplane engine has 6000 parts and that there are 78,000 rivets in the fuselage of a pursuit ship.

Two Different Tribes

■ We notice in *Popular Science* that American Indians are in

special demand as structural steel workers because of their ability to walk beams without becoming dizzy. We here in Cleveland recall with a grimace that those American League Indians don't seem to have retained their forefathers' calm at the top of the ladder.

Okay Not O. K.

■ It has never really bothered us seriously before, but now we are all in a dither about that simple little expression *O.K.* (or is it *okay*, *okeh*, or *okey*?). D. E. Jackman complains about the wide use of *okay*, which, he says, is not correct. It should be *O.K.*, meaning *Oil Korrekt*. Another school of etymology argues that it comes from the Indian-Choc-taw *okeh*, meaning it is so. Now we're going to be hesitant about using one of our pet expressions. Any suggestions?

British Advice

■ Several weeks ago we told you about the renewal order that came up from "down under" with a cryptic note scribbled on it by the British censor that he was sorry but no cheque had been enclosed. Now we hear of the young lady in this country who received a letter from her mother in London with this notation in the handwriting of the censor: *P. S. Your mother talks too much.*

The Popular Maude

■ Our bovine, Maude, seems to have a peculiar appeal. Last week we casually mentioned we had several pictures of her left over from the Metal Show and bang—this week we are cleaned out. Some more are being printed and we'll let you know as soon as they are ready.

Oh Well

■ We still think we made a good prediction on the election, don't you? But we do feel like we just ate about fifteen issues of the *Literary Digest*.

SHRDLU.

terials, but no substantial tonnages have been ordered by either mills or foundries during the past ten days or two weeks.

Toronto, Ont. — Under pressure of increasing demand dealers have moved up buying price on stove plate 25 cents per ton, now offering a top of \$13.75 per net ton, delivered Toronto yards.

San Francisco—The flow of scrap continues strong and California open-hearth producers continue to buy heavily. No further weakness has developed and No. 1 heavy melting steel in the San Francisco metropolitan area continues at \$13 to \$13.50 a net ton. Los Angeles quotations on No. 1 heavy melting hold at \$12.75 to \$13.25.

Warehouse

Warehouse Prices, Page 95

Cleveland—Warehouses find it increasingly difficult to maintain rounded stocks. In addition to supplying regular customers they have been selling to those who ordinarily buy from mills. November sales volume holds up to the October rate which had been the best of the year.

Chicago — Warehouse sales are at a satisfactory level, although the increase in October over September is leveling off. Bars, alloy and high carbon, still top demand. Structurals also are somewhat stronger.

Philadelphia — Sales hold near the active October volume which for most distributors was the best month in several years. The outlook is enhanced by the likelihood of continued delays in mill deliveries. Prices are steadiest in some time.

Cincinnati—Warehouse sales on such volume that a peak for the year may be recorded in November. Considerable tonnage is on accounts requiring speedier delivery than possible from mills. Jobbers' stocks on most items are adequate.

St. Louis — Distribution of steel from store continues at a high rate, with demands unusually diversified. October volume so far reported ranges from 10 to 20 per cent over September, and in the case of two important interests was highest for the month since 1929.

Seattle — Dealers report marked increase in volume, all items being in good demand. October turnover is reported about 50 per cent larger than September. Plates are in particular demand with shapes and sheets also strong.

Piling Arbitraries Off

Pittsburgh — Effective on all fourth quarter deliveries, arbitraries on sheet steel piling for delivery at

Gulf and Pacific ports by Carnegie-Illinois Steel Corp. have been eliminated. Price at those points is now Pittsburgh or Chicago base, plus freight.

Iron Ore

Iron Ore Prices, Page 96

Cleveland — Iron ore shipments from upper lake ports in October totaled 10,061,127 gross tons, the largest for that month since complete records were kept, from 1919, according to the Lake Superior Iron Ore association, Cleveland. They compare with 9,201,249 tons in October, 1939. The previous top for October had been 9,337,774 tons in 1926. September's aggregate shipments were 9,998,618 gross tons, which was an all-time high for that month. The October increase was 859,878 tons, or 9.35 per cent, over the corresponding month of 1939. The smallest October was 1932 at 926,520 tons.

Cumulative tonnage to Nov. 1 was 58,296,354 tons, compared with 39,593,570 tons for a like period of 1939. This was an increase of 18,702,784 tons, or 47.24 per cent.

Comparisons by ports for October are as follows:

	Gross Tons	
	Oct. 1940	Oct. 1939
Escanaba	486,443	486,538
Marquette	816,589	880,742
Ashland	942,874	1,124,270
Superior	3,345,842	3,633,197
Duluth	2,796,432	1,580,078
Two Harbors	1,620,424	1,496,424
Total U. S. Ports	10,008,604	9,201,249
Michipicoten	52,523	.....
Total	10,061,127	9,201,249

Comparison by ports for the season to Nov. 1 are as follows:

	Gross Tons	
	To Nov. 1, 1940	To Nov. 1, 1939
Escanaba	3,036,810	2,187,128
Marquette	4,916,793	3,756,559
Ashland	5,395,068	4,776,587
Superior	20,265,203	13,363,082
Duluth	14,609,349	7,745,534
Two Harbors	9,779,474	7,733,133
Total U. S. Ports	58,002,697	39,562,023
Michipicoten	293,657	31,547
Total	58,296,354	39,593,570
Increase from 1939	18,702,784	.....

Steel in Europe

Foreign Steel Prices, Page 95

London—(By Cable)—Prices have been increased on steel products in Great Britain, effective Nov. 1. The advance on semifinished and heavy steel is £1 15s per ton, £2 on plates and corresponding changes on finished steel. All steelworks are operating near capacity. Important tonnages of iron ore, scrap

and semifinished steel have been stocked. The hematite iron situation has been eased by large arrivals from America. The export situation in tin plate is quiet.

Tin Plate

Tin Plate Prices, Page 92

Pittsburgh—Operations are steady at 44 per cent. Sellers are at a loss to explain the lack of business, but there will be little carryover into next year. Stocks of both producers, and canmakers, are being depleted. A little spurt in some products has increased consumption of packers' cans. Reports from the East say that with the expected early announcement of tin plate prices for next year substantial contracting should get under way soon. Domestic buying is seasonally dull and export business remains negligible. Chicago reports purchases of tin plate have shown some improvement and orders on books are normal. Deliveries can be made in four weeks. Pick-up is anticipated in four to six weeks.

Metallurgical Coke

Coke Prices, Page 93

By-product foundry coke in the New York-Northern New Jersey

metropolitan district has been advanced 50 cents a ton, to a spread of \$11.88 to \$12.35, delivered Newark, N. J. This is the first change in more than a year, when a 50-cent increase was made effective, and follows advances of 50 cents earlier in the fall in New England and upstate New York.

High-Speed Steel Price Holds for First Quarter

Vanadium-Alloys Steel Co. has announced the price of high-speed steel during first quarter of 1941 will remain at 67 cents base, unchanged from the 1940 level.

Ferromanganese Prices Are Reaffirmed Early

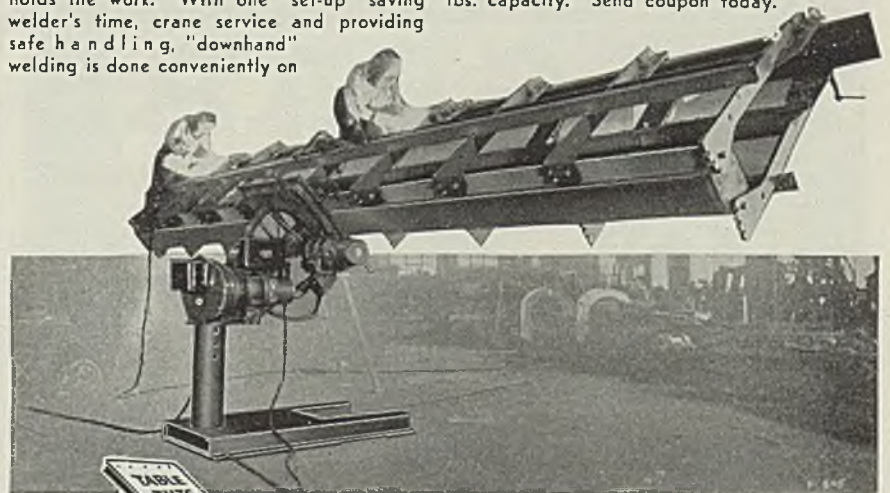
New York — Ferromanganese prices have been reaffirmed for first quarter at \$120, duty paid, Atlantic and Gulf ports, by a leading seller. This announcement is well in advance of the usual time and is designed to stabilize rate of shipment as far as possible.

This seller is also reaffirming prices on all his other leading products, including manganese, silicon and chrome alloys. The trade looks

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for other sellers to make similar announcements. The last general advance was in June, when ferromanganese was advanced \$20 a ton.

While the present announcement of prices for next quarter will have a stabilizing influence on the movement of ferroalloys, the trend in shipments has been steadily upward since the end of July, and this is expected to continue.

Spiegeleisen prices, which usually follow the ferromanganese market, are generally expected to be reaffirmed. The 26-28 per cent grade at \$49.50 is included among the manganese alloys extended in the present announcement. The only question is with respect to the 19-21 per cent grade, which is \$36, Palmerton, Pa., and no change is expected.

Nonferrous Metal Prices

	Copper		Casting, refinery	Straits Tin, New York		Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Anti-mony Amer. Spot, N. Y.	Nickel Cathodes
Nov.	Electro, del. Conn.	Lake, del. Midwest		Spot	Futures						
2	12.00	12.00	12.12 1/4	51.00	50.20	5.50	5.35	7.25	18.00	14.00	35.00
4	12.00	12.00	12.12 1/4	51.00	50.20	5.50	5.35	7.25	18.00	14.00	35.00
5	Holiday										
6	12.00	12.00	12.12 1/4	50.87 1/2	50.20	5.65	5.50	7.25	18.00	14.00	35.00
7	12.00	12.00	12.12 1/4	50.87 1/2	50.12 1/2	5.65	5.50	7.25	18.00	14.00	35.00
8	12.00	12.00	12.12 1/4	51.00	50.25	5.80	5.65	7.25	18.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets	
Yellow brass (high)	19.23
Copper, hot rolled	20.62
Lead, cut to jobbers	7.90
Zinc, 100 lb. base	12.50

Tubes	
High yellow brass	21.98
Seamless copper	21.12

Rods	
High yellow brass	14.76
Copper, hot rolled	17.12

Anodes	
Copper, untrimmed	17.87

Wire	
Yellow brass (high)	19.48

OLD METALS

Nom. Dealers' Buying Prices No. 1 Composition Red Brass	
New York	8.00-8.25
Cleveland	8.62 1/2-9.12 1/2
Chicago	8.25-8.50
St. Louis	8.37 1/2

Heavy Copper and Wire	
New York, No. 1	9.62 1/2-9.87 1/2
Cleveland, No. 1	9.37 1/2-9.87 1/2
Chicago, No. 1	9.75-10.00
St. Louis	9.37 1/2

Composition Brass Turnings	
New York	7.62 1/2-7.87 1/2

Light Copper	
New York	7.62 1/2-7.87 1/2
Cleveland	7.37 1/2-7.87 1/2
Chicago	7.75-8.00
St. Louis	7.37 1/2

Light Brass	
Cleveland	4.12 1/2-4.37 1/2
Chicago	5.62 1/2-5.87 1/2
St. Louis	4.87 1/2

Lead	
New York	4.90-5.00
Cleveland	4.00-4.25
Chicago	4.35-4.60
St. Louis	3.62 1/2-3.87 1/2

Zinc	
New York	3.87 1/2-4.12 1/2
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum	
Mls., cast, Cleveland	9.25-9.50
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.25
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.25
Standard No. 12 aluminum	15.00-15.50

Nonferrous Metals

New York—Re-election of the President indicates that the government will continue to restrain price advances in metals. Conferences were held this past week between officials of the government and the copper industry to study the present situation as regards stocks, processing capacity, etc. Tightness in supplies common to all metal markets, resulted in two advances in lead prices.

Copper—Mine producers again allocated sales at their 12-cent level while custom smelters booked business at 12.37 1/2c, Connecticut valley. Resale copper ranged from 12.50c for first quarter delivery to 12.75c for fourth quarter delivery. Sales averaged about 3000 tons daily.

Lead—Prices rose 15 points on Wednesday and a like amount on Friday, lifting the market to the basis of 5.80c, New York, and 5.65c, East St. Louis. This is the highest level attained since October, 1937. The upward revisions were necessary since demand exceeded domestic supply and the market had to be higher in order to attract foreign lead, the price of which in turn has been advancing recently.

Zinc—An unusually tight situation prevailed, although prices held at the 7.25-cent level in the absence of buying pressure. Total stocks of slab zinc dropped to only 22,600 tons last month, the equivalent of only slightly more than one week's requirements.

Tin—Moderate business was done within the narrow price range of 50.87 1/2c to 51.00c on Straits spot. Shipments of tin from the Straits continue to exceed consumption.

Defense Contracts

(Concluded from Page 27)

Navy department announced the following yards and docks awards:

- Angle, Charles W., Inc., 50 housing units, Parris Island, South Carolina, \$137,700.
- Arundel Corp. & Consolidated Engineering Co. Inc., housing units and other construction, naval air stations, San Juan, P. R., and St. Thomas, V. I., \$1,469,360.
- Austin Co., Cleveland, aviation, ammunition and fuel storage facilities, Puget Sound area, Washington, \$95,000.
- Brown & Root, W. S. Bellows and Columbia Construction Co., recreation facilities, outlying training field, naval air station, Corpus Christi, Tex., \$3,116,325.
- Diamond Construction Co., improvement of waterfront, naval magazine, Bellevue, District of Columbia, \$144,000.
- Duval Engineering Co. & Associates, incinerator, naval air station, Jacksonville, Fla., \$35,000.
- Fuller, George A., Co. & Associates, New York, 236 housing units, Quonset Point, R. I., \$667,000.
- Hardaway Contracting Co., Columbus, Ga., outside power connections, Pensacola, Fla., \$49,500.
- Harwood-Nebel Construction Co., 10 housing units, Piney Point, Md., \$30,000.
- Hawaiian Dredging Co. & Associates,



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1300 housing units, other construction, Honolulu and other Pacific bases, \$4,244,400.

Jeffress-Dyer Co. Inc., 150 housing units, Dahlgren, Va., \$386,100.

Johnson, Drake & Piper Inc., 600 housing units, naval air station, Alameda, Calif., \$1,897,000.

Kidde, Walter, Constructors Inc., improvement of services, New York navy yard, \$225,000.

Loeffler, Douglas, Co., Detroit, alterations to existing officers' mess building, naval reserve aviation base, Grosse Ile, Mich., \$53,550.

McShain, John, Inc., aviation and marine corps facilities, marine barracks, Quantico, Va., \$956,470.

Merrill Co. Inc., Boston, fire protection system for building 39, Boston navy yard, \$18,540.

M. & L. Construction Co. Inc., mezzanine floor in building 77, aircraft factory, \$12,500.

Pacific Fence Co., Los Angeles, nonclimbable fence, eleventh naval district radio stations, Chollas Heights and Point Loma, San Diego, Calif., \$14,518.

Siems Spokane Co. & Associates, construction, Alaskan naval air stations, \$1,628,000.

Simons-Mayrant Co., storehouse, cafeteria, locker facilities at navy yard, Charleston, S. C., \$93,000.

Shannahan Bros. Inc., Huntington Park, Calif., improvements to breakwater and waterfront structures, naval air station, San Pedro, Calif., \$152,450.

Snare, Frederick, Corp., New York, magazines, storehouses, dredging, moorings, 500 housing units, Guantanamo, Cuba, \$5,083,030.

Bureau of Supplies and Accounts Awards

Atlantic Metal Hose Co. Inc., New York, bronze steam hose, \$16,575.

American Brass Co., Waterbury, Conn., naval brass forgings, bronze steam hose, \$74,622.16.

American-LaFrance-Foamlite Corp., Elmira, N. Y., spare parts for fire extinguishers, \$9309.72.

American Tool Works, Cincinnati, radial drills, engine lathe, \$63,666.

Anderson, Dorsey C., Philadelphia, electric arc welding sets, \$15,000.

Armstrong-Blum Mfg. Co., Chicago, band saw for metal, \$5016.

American Locomotive Co., Schenectady, N. Y., turret rollers, \$144,978.

Austin-Hastings Co. Inc., Cambridge, Mass., radial drills, \$17,276.

Babcock & Wilcox Tube Co., Beaver Falls, Pa., steel boiler tubes, \$28,457.89.

Baker-Raulang Co., Cleveland, electric trucks, \$6285.56.

Baldt Anchor, Chain & Forge Corp., Chester, Pa., steel chain, \$14,977.92.

Baldwin Locomotive Works, Standard Steel Works division, Philadelphia, turret rollers, \$146,073.

Behringer, E., Sheet Metal Works, Inc., Newark, N. J., steel head shells, \$56,330.

Bender Body Co., Elyria, O., racks, shelves, dividers, \$76,778.

Bethlehem Steel Co., Bethlehem, Pa., bar steel, \$36,938.29.

Brown & Sharpe Mfg. Co., Providence, R. I., milling machines, \$13,557.

Carnegie-Illinois Steel Corp., Pittsburgh, bar steel, \$16,334.95.

Chapman Valve Mfg. Co., Indian Orchard, Mass., valves, \$12,515.

Cincinnati Bickford Tool Co., Cincinnati, radial drills, \$26,424.20.

Circle Wire & Cable Co., Maspeth, Long Island, N. Y., electric cable, \$8727.75.

Colyer Insulated Wire Co., Pawtucket, R. I., electric cable, \$5084.36.

Colson-Merriam Co., Washington, brass oil syringes, \$8516.23.

Columbia Steel Co., Provo, Utah, cast steel anchors, \$43,200.

Consolidated Machine Tool Corp., Rochester, N. Y., heavy duty lathes, \$487,165.

Continental Motors Corp., Muskegon, Mich., electric generator sets, \$5411.12.

Crane Co., Chicago, cocks and valves, \$86,082.50.

Crescent Insulated Wire & Cable Co., Trenton, N. J., electric cable, \$12,958.

Crucible Steel Co. of America, New York, steel welding electrodes, alloy steel forgings, \$71,375.

Curry, I. C. and F. E. Young, San Diego, Calif., buildings at San Diego destroyer base, estimated to cost \$1,125,000.

Davidson, M. T., Co., Brooklyn, N. Y., centrifugal type pumps, \$20,588.40.

Doehler Die Casting Co., Pottstown, Pa., miniature practice bombs, \$48,074.

Extruded Metals Inc., Belding, Mich., brass boat facing, \$7469.58.

Foster Engineering Co., Newark, N. J., valves, \$5780.80.

General Motors Corp., Chevrolet division, Detroit, motor trucks, \$5713.34.

Gorton, George, Machine Co., Racine, Wis., engraving machines, \$16,589.58.

Gould & Eberhardt, Newark, N. J., gear cutting machine, \$23,568.

Hooven, Owens, Rentschler Co., Hamilton, O., spare parts for main engine, \$74,975.98.

Hudgins, R. W., & Son, Norfolk, Va., packing extracting tools, \$10,254.

Jones & Lamson Machine Co., Springfield, Vt., turret lathes, \$23,277.90.

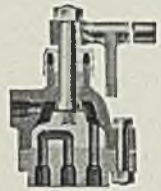
Keckley, O. C. Co., Chicago, valves, \$11,490.

Kidde, Walter, & Co. Inc., New York, fire extinguishers, \$15,838.

Levene Motor Co., Philadelphia, am-

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meters, distributors, switches, \$5583.65.
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 double drum winches, \$65,228.
 Link Aviation Devices Inc., Blinghamton,
 N. Y., link trainers, \$662,044.97.
 Lodge & Shipley Machine Tool Co., Cin-
 cinnati, engine lathe, \$7638.
 Lukens Steel Co., Coatesville, Pa., trun-
 nion blocks and caps, \$64,314.96.
 Lynch, Edward A., Machinery Co., Phil-
 adelphia, drilling and tapping ma-
 chines, \$5605.
 Magnaflux Corp., Chicago, magnetizing
 and inspection units, \$10,247.40.
 Midvale Co., Philadelphia, steel forg-
 ings, \$670,000.
 Mine Safety Appliances Co., Pittsburgh,
 first aid kit containers, \$8950.
 Motley, James M., & Co. Inc., New York,
 forging machines, bolt and staybolt
 threading machines, \$26,782.
 Mueller Brass Co., Port Huron, Mich.,
 naval brass forgings, \$50,746.30.
 National Carbon Co., New York, flash-
 lights, \$27,941.32.
 National Malleable & Steel Castings Co.,
 Cleveland, cast steel chain, \$131,939.
 Norris Stamping & Mfg. Co., Los Angeles,
 ammunition boxes, \$848,812.50.
 Niagara Motors Corp., Dunkirk, N. Y.,
 semi-finished plunger forgings, \$28,-
 359.80.
 Niagara Searchlight Co. Inc., Niagara
 Falls, N. Y., flashlights, \$13,229.31.
 Niles-Bement-Pond Co., Pratt & Whitney
 division, West Hartford, Conn., verti-
 cal, miller and profiler machines,
 jig boring vertical machine, \$21,192.20.
 Ohio Injector Co., Wadsworth, O., valves,
 \$60,042.67.
 Parker Appliance Co., Cleveland, tube
 benders, \$6700.
 Pennsylvania Flexible Metallic Tubing
 Co., Philadelphia, bronze fuel oil and
 steam hose, \$8484.
 Phelps Dodge Copper Products Corp.,
 New York, brass pipe, electric cable,
 \$20,820.95.
 Pittsburgh Valve & Fittings Corp.,
 Barborton, O., valves, \$48,794.10.
 Plomb Tool Co., Los Angeles, wrenches,
 \$6305.
 Prentiss, Henry, & Co. Inc., New York,
 boring, milling, drilling machines \$78,-
 292.
 Rainear, C. J., & Co. Inc., Philadelphia,
 valves, \$7129.61.
 Reed-Prentice Corp., Worcester, Mass.,
 engine lathes, \$62,970.

Reld Avery Co., Dundalk, Baltimore,
 steel welding electrodes, \$29,880.
 Revere Copper & Brass Inc., Baltimore,
 copper tubing, brass boat facing, \$107,-
 934.20.
 Rockford Machine Tool Co., Rockford,
 Ill., metal shapers, \$18,332.25.
 Sebastian Lathe Co., Cincinnati, engine
 lathes, \$51,064.
 Sharples Corp., Philadelphia, diesel fuel
 oil purifiers, \$45,052.56.
 Sidney Machine Tool Co., Sidney, O., en-
 gine lathes, \$12,762.
 Sperry Gyroscope Co. Inc., Brooklyn,
 N. Y., directional and horizons gyros,
 \$404,350.
 Star Machinery Co., Seattle, boring, mill-
 ing, drilling machines, \$25,715.74.
 Stewart-Warner Corp., Chicago, minia-
 ture practice bombs, \$23,688.70.
 Swind Machinery Co., Philadelphia, bor-
 ing, milling, drilling machines, \$103,-
 104.
 United Aircraft Corp., Pratt & Whitney
 Aircraft division, East Hartford, Conn.,
 airplane engines, \$104,693,132.34.
 United Engineering & Foundry Co.,
 Pittsburgh, spare cylinders, \$17,520.

United Metal Hose Co. Inc., Long Island
 City, N. Y., bronze steam hose, \$23,-
 410.
 Walworth Co., New York, valves, \$126,-
 057.04.
 Worthington Pump & Machinery Corp.,
 Harrison, N. J., centrifugal type pumps,
 \$37,788.

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 and headed a British air mission
 that bought \$25,000,000 of aircraft
 in this country for the Royal Air
 Force. He was appointed by Arthur
 Purvis, director-general of the Brit-
 ish Purchasing commission.

Construction and Enterprise

Ohio

AKRON, O.—Snap Grip Products Inc.
 has been incorporated by Herbert B.
 Myers, 911 Hardesty boulevard, to man-
 ufacture tools and appliances.

CANTON, O.—Foundry Specialty Mfg.
 Co., 1215 Prospect avenue, is altering
 two-story building for production pur-
 poses.

CHAUNCEY, O.—Bonds have been ap-
 proved in sum of \$19,600 for a sewage
 disposal plant and sewers. J. J. Mor-
 gan, 255 East Broad street, Columbus.
 O., is engineer.

CLEVELAND—Master Products Co.,
 manufacturer of metal stampings, 6408
 Park avenue, is building a storage addi-
 tion costing \$15,000.

CLEVELAND—Cleveland Steel Prod-
 ucts Corp., 7306 Madison avenue, has

bought site and will erect new plant,
 for which plans are being drawn. W. J.
 Smith is vice president and general
 manager.

CLEVELAND—Federal Foundry &
 Supply Co., L. H. Hely, president, 4600
 East Seventy-first street, is asking bids
 on one-story additions 45 x 60 and 20 x
 36 feet, to cost about \$50,000. H. E.
 Shummin, 1720 Euclid avenue, Clevel-
 and, is architect.

CLEVELAND—Globe Machine &
 Stamping Co., 1250 West Seventy-sixth
 street, is assuming control of Crescent
 Machine Co., Leetsdale, O., manufacturer
 of machines. Companies will be operated
 as separate units. Globe company is
 building 10,000-square foot addition at
 Cleveland.

CLEVELAND—Hotstream Water Heater
 Co., Louis R. Mendelson, president,
 8007 Grand avenue, has bought three-
 story warehouse building containing

■ Additional Construction and En-
 terprise leads may be found in the
 list of Shapes Pending on page 101
 and Reinforcing Bars Pending on
 page 106 of this issue.

70,000 square feet floor space at Quincey
 avenue and East Sixty-ninth street.
 Will remodel on plans by George Eber-
 ling, architect, Cuyahoga building.

ELYRIA, O.—Western Automatic Ma-
 chine & Screw Co., Lake avenue, is
 building bar stock storage building,
 one story, 24 x 190 feet. J. B. Halpin
 Co., 30 Chestnut street, has general con-
 tract.

PLYMOUTH, O.—Village council has
 retained Carl J. Simons & Associates,
 Evans-Central building, Van Wert, O.,
 as consulting engineers on proposed
 municipal electric power plant. Will be
 financed by mortgage redemption bonds.

TIFFIN, O.—Midland Wire Co. asks
 bids Nov. 21 for a one-story factory ad-
 dition 75 x 100 feet, to cost about \$40,000.

WARREN, O.—American Welding &
 Mfg. Co., H. J. Kalghin, president, will
 build a plant addition increasing ca-
 pacity about one-third, to care for de-
 fense orders and increased demand from
 other sources. Company manufactures

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INGOT



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CHAPTER IV—The Rolling of Shapes.

CHAPTER V—Die Rolling.

CHAPTER VI — Rolling Mill Torque.

APPENDIX (The Rolling of Non-ferrous Metals—Roll Passes for Seamless Tubes).

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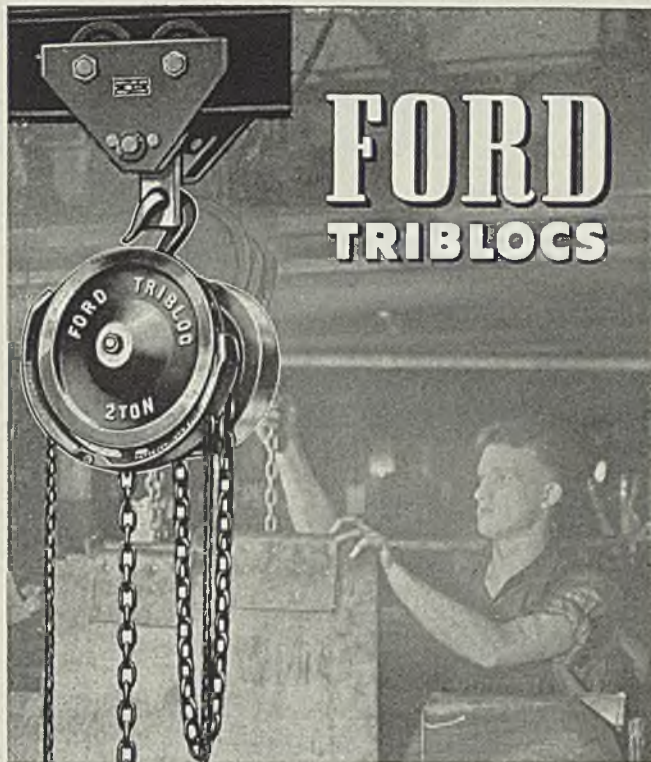
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Connecticut

HARTFORD, CONN.—Fuller Brush Co., 3580 Main street will let contract soon for a one-story 140 x 142-foot factory addition through Mylchreest & Reynolds, engineers, 238 Palm street. Estimated cost \$35,000.

HARTFORD, CONN.—Colt's Patent Fire Arms Mfg. Co., 17 Van Dyke avenue, will let contract soon for a three-story 110 x 174-foot office building to cost about \$250,000. M. Moore and C. Salisbury, 969 Farmington avenue, West Hartford, are architects.

NORWALK, CONN.—Segal Lock & Hardware Co., 395 Broadway, New York, will build a one-story addition 100 x 200 feet at plant here, estimated to cost \$40,000.

New York

BROOKLYN, N. Y.—Triborough bridge authority, Randalls Island, N. Y., will take bids about Dec. 1 for a bascule bridge with two 42-foot roadways over Gowanus canal, to cost about \$1,000,000.

BROOKLYN, N. Y.—Glyco Products Co. Inc., manufacturer of chemical products, has approved plans for a new plant at 228 King street, where operations will be begun about Dec. 15. Will contain manufacturing research and administrative units.

NORTH TONAWANDA, N. Y.—City plants sewage disposal works and intercepting sewers, to cost about \$100,000.

New Jersey

TRENTON, N. J.—DeLaval Steam Turbine Co., 853 Nottingham Way, will build a one-story 65 x 65-foot plant. J. W. Ferguson Co. Inc., 152 Market street, Paterson, N. J., is low bidder.

WALLINGTON, N. J.—Tube Reducing Corp., 292 Madison avenue, New York, will build a one-story 100 x 320-foot plant, general contract to Deakman, Wells Co., 921 Bergen avenue, Jersey City, N. J., to cost about \$100,000.

Pennsylvania

BERWYCK, PA.—American Car &

Foundry Co. will build a machine shop addition 160 x 280 feet, heat-treating building 100 x 260 feet and carburizing building 120 x 135 feet. Also new general office building.

CORRY, PA.—C. B. Porter, city clerk, is having survey made for sewage disposal plant and appurtenances, to cost more than \$25,000. N. R. Dickson, is city engineer.

DANVILLE, PA.—Kennedy-Van Saun Mfg. & Engineering Co. is asking bids on a one-story machine shop addition to cost about \$40,000.

GREENVILLE, PA.—Delssler Machine Co. has bought 12 acres and will erect three plant buildings. Company manufactures four-cylinder condensers for refrigerating units.

MEADVILLE, PA.—McCrosky Tool Corp., F. P. Miller in charge, is building a one-story 65 x 100-foot factory addition.

PORT ALLEGHENY, PA.—Pennsylvania highway department, I. L. Hughes, secretary, Harrisburg, will build a three-span concrete and steel bridge to carry highway route 101 over railroad tracks, at cost of about \$117,000.

Michigan

BATTLE CREEK, MICH.—Wilcox-Rich division Eaton Mfg. Co. has given general contract to G. O. Lewis Co., Battle Creek, for a plant addition.

DETROIT—Mechanical Handling Systems Inc. has given general contract to C. A. Handeyside Construction Co. for a \$20,000 factory building.

DETROIT—Aero Tool Co., 2963 Heidelberg avenue, has been incorporated with \$50,000 capital to manufacture tools and machinery, by Herman A. Genrich, 9400 Meyers road, Detroit.

DETROIT—U. S. Broach Co., 2746 Penobscot building, has been incorporated with \$30,000 capital to manufacture broaches and fixtures, by John K. Penny, 18107 Ohio avenue, Detroit.

DETROIT—Bendix Aviation Corp., South Bend, Ind., has bought plant of former Graham Paige Co. and will recondition and equip it for manufacture

of airplane parts at cost of \$200,000, including equipment.

DETROIT—Allied Waste Material Co. Inc. has been incorporated with \$2000 capital to deal in ferrous and nonferrous metals, by Max Kwartowitz, 1981 Taylor avenue, Detroit.

GRAND RAPIDS, MICH.—Mount Vernon Foundry Co. has been incorporated with \$5000 capital to manufacture aluminum and nonferrous castings, by Leonard De Vos, 15 Mt. Vernon N. W., Grand Rapids, Mich.

PORTLAND, MICH.—Tri-County Electric Co-operative will build a power plant here at cost of \$175,000, of which \$123,000 will be for equipment.

Illinois

CHICAGO—Lindberg Engineering Co., 221 North Laflin street, is seeking site for new plant, present works being too small. Company manufactures heat-treating furnaces and controls.

CHICAGO—LaFayette Steel Corp., 4146 South Karlov avenue, will build a one-story steel warehouse costing \$100,000 at 4126 West Forty-second place, containing about 40,000 square feet floor space.

CHICAGO—A. Finkl & Sons, 2011 North Southport avenue, are building an addition and installing equipment to increase production of carbon and alloy forgings. Expansion program will cost about \$250,000.

CHICAGO—Central Pattern & Foundry Co., 3737 South Sacramento avenue, manufacturer of aluminum, brass and bronze castings, is erecting an addition of about 100,000 square feet, costing about \$20,000, to increase capacity 30 per cent.

CHICAGO—Quality Hardware & Machine Corp., 5849 Ravenswood avenue, is increasing production capacity 15 per cent by installation of new equipment. Machinery costing \$75,000 has been placed and \$25,000 worth remains to be bought. This includes dieing machine, two jig borers, shaper, lathe and several grinders. Company manufactures tools, dies, jigs, fixtures and special machinery.

ROCKFORD, ILL.—Ingersoll Milling Machine Co. will build one-story addition with 8500 square feet floor space.

Indiana

NEW CASTLE, IND.—Perfect Circle Co. will build a one-story addition with two-story wing, at cost of about \$175,000.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids as follows: Nov. 12, schedule 3965, motor-driven hydraulic press for Portsmouth, N. H.; schedule 3900, motor-driven radial drill for South Boston; schedule 3910, motor-driven horizontal forging machine; schedule 3928, two motor-driven radial drills for Philadelphia; schedule 3931, motor-driven pipe threading machine for South Boston; Nov. 15, schedule 3975, motor-driven boring, drilling and milling machine for Brooklyn, N. Y.; schedule 3917, seven motor-driven radial drills for Philadelphia; schedule 3940, motor-driven rotary surface type grinding machine for Newport, R. I.; Nov. 16, five motor-driven universal tool and cutter grinders; Nov. 19, schedule 3824, motor-driven bolt pointing machine for Mare Island, Calif.; schedule 3963, motor-driven pipe and nipple threading machines for Mare Island, Calif.; motor-driven press brake for Mare Island, Calif.; schedule 3918, six motor-driven geared head engine lathes for Wickford, R. I., Jacksonville, Fla., and Corpus Christi, Tex.; schedule 3919, motor-driven rotary shear, on cars; schedule 3924, three motor-driven upright drilling machines, aboard vessel;

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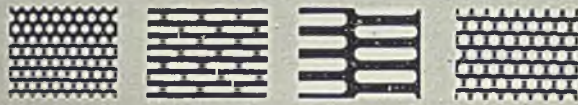
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Georgia

BRUNSWICK, GA.—McCrary Engineering Co. Inc., York, Pa., P. R. McCrary, president, will build a tractor manufacturing plant here.

South Carolina

CHARLESTON, S. C.—Consolidated Iron & Metal Co. has been incorporated with \$1000 capital, Samuel Greenberg, president, to deal in old metals and scrap.

Missouri

KANSAS CITY, MO.—Hart-Bartlett-Sturtevant Grain Co., will build combination, river-rail-truck grain terminal at Nebraska City, Nebr., with capacity of 150,000 bushels, with plans for eventual storage facilities for 500,000 to 1,000,000 bushels.

ST. LOUIS—Eclipse Mfg. Co., 4336 West Pine boulevard, Sam Kauffman, president, has been organized to manufacture hot air register shields.

ST. LOUIS—A. B. Shanfeld Iron & Metal Co., 1530 Congress street, M. W. and J. Shanfeld, partners, has leased building at Dock and Hall streets, 71,000 square feet, which will be remodeled and equipment installed.

ST. LOUIS—Barry Wehmiller Machinery Co., 4660 West Florissant avenue, Lille Rassieur, president, is building a one-story addition to its plant at 4656 Rosalie street, costing \$12,000. Company manufactures pasteurizing and bottling machinery.

Wisconsin

FOND DU LAC, WIS.—Giddings & Lewis Machine Tool Co. is negotiating with government for plant expansion in connection with national defense. Plans call for expenditure of \$1,750,000, including equipment.

MADISON, WIS.—Theo. Kupfer Foundry & Iron Works is making extensive improvements to its foundry.

MILWAUKEE—Sivyer Steel Casting

Co. will build a foundry addition 36 x 220 feet, costing \$30,000. Klug & Smith are contractors.

MILWAUKEE—Ampeco Metal Inc. has started construction of a plant addition containing 8000 square feet floor space, for use as foundry. This is third plant expansion in a year.

MILWAUKEE—R. Perlek Brass Co. will remodel old Mayhew plant, recently purchased, at cost of \$20,000. Selzer-Ornst Co. has contract.

MILWAUKEE—Harnischfeger Corp., manufacturer of cranes, hoists, welding machines and other products, is building a plant addition 60 x 100 feet.

MILWAUKEE—Louis Allis Co., manufacturer of electric motors, generators and similar equipment, is building a one-story addition 97 x 100 feet, on plans by E. J. Schrang, architect.

MILWAUKEE—Milwaukee Coke & Gas Co., manufacturer of coal tar by-products, will build a coke-handling conveyor costing about \$75,000. J. E. Kullman is engineer.

MILWAUKEE—Globe Steel Tubes Co., West Burnham street, will build one-story laboratory building 40 x 128 feet and a steel-treating building 80 x 332 feet, at total cost of about \$40,000.

MILWAUKEE—King Machine Co., 815 West Juneau avenue, has bought the plant of the Wisconsin Gray Iron Foundry Co., 4530 West Burnham street; will remodel and build \$20,000 addition, 60 x 100 feet. Company does general machine jobbing business.

PORT WASHINGTON, WIS.—Wisconsin Electric Power Co. has been authorized by Wisconsin public service commission to start a \$7,660,000 expansion, including 23-mile transmission line from Port Washington to Grandville, Wis., and increase generating capacity at both points to an aggregate of 40,000 kilowatts.

WEST ALLIS, WIS.—Pressed Steel Tank Co., is building a warehouse addition 67 x 79 feet, costing \$18,000.

Iowa

DES MOINES, IOWA—C. L. Percival Co., manufacturer of commercial re-

frigerators, will build plant at Boone, Iowa, and move its operations there.

WATERLOO, IOWA—Rath Packing Co. will build one-story corrugated steel building 77 x 344 feet, to house its food department. Cost estimated at \$27,500 exclusive of electrical, plumbing and heating.

California

BURBANK, CALIF.—Bendix Aviation Ltd., Empire avenue, is having plans made for a plant addition containing 20,000 square feet floor space, costing about \$40,000. An office building is now under construction.

LOS ANGELES—Hollister Coil Spring Co., 7100 Avalon boulevard, is building a warehouse addition 40 x 50 feet, costing \$1300.

LOS ANGELES—Offenhauser Engineering Co., 1935 West Sixty-seventh street, is building a new machine shop at 2001 West Gage avenue, 66 x 120 feet, costing \$10,000.

LOS ANGELES—Columbia Stamping & Mfg. Co., 2936 South Western avenue, is building a brick machine shop at 8719 Crocker street, 86 x 191 feet, costing \$9500.

LOS ANGELES—Twenty Metals Inc. has been incorporated with \$500,000 by H. M. Mayes, 3907 Lankersheim boulevard, North Hollywood, Calif., and associates.

LOS ANGELES—Doak Aircraft Co. Inc., has been organized with \$1,000,000 capital by E. N. Doak and Windsor Crow of Los Angeles and Reid Parking, Inglewood, Calif. Leonard Comegys, 811 West Seventh street, Los Angeles, is representative.

Oregon

SALEM, OREG.—State highway commission will receive bids Nov. 12 for a two-story concrete laboratory 112 x 120 feet at Salem.

Washington

SEATTLE—England Tool Co. has been incorporated with \$20,000 capital by A. E. England and associates, 300 East Pike street.

Canada

PETERBOROUGH, ONT.—Peterborough Lock Co., 198 Simcoe street, has plans under consideration for \$30,000 plant addition. E. H. Howson is manager.

ST. LAURENT, QUE.—Industrial Glass Co. Ltd., Ouimet avenue, will build 120 x 150-foot plant addition costing \$500,000 with equipment. Structural steel to be furnished by Dominion Bridge Co. Ltd., Lachine, Que.

TORONTO, ONT.—Small Electric Motors Ltd., Beckenham, Eng., will build a plant in the Toronto area, to employ 70 workers.

TORONTO, ONT.—Anaconda American Brass Ltd. will build an addition to its plant at New Toronto, Ont., to cost \$700,000.

TORONTO, ONT.—Canadian Wire-bound Boxes Ltd., Gerrard street East, has bought site for addition to cost \$75,000, including equipment.

WELLAND, ONT.—Dickie Construction Co. Ltd., 17 Yorkville avenue, has general contract for plant addition for Page Hersey Tubes Ltd., Church street, Toronto, estimated to cost \$50,000.

WELLAND, ONT.—Atlas Steels Ltd., Main street East, is having plans prepared by R. I. MacBeth, 104 Queen street, St. Catharines, Ont., for an addition to cost about \$275,000.

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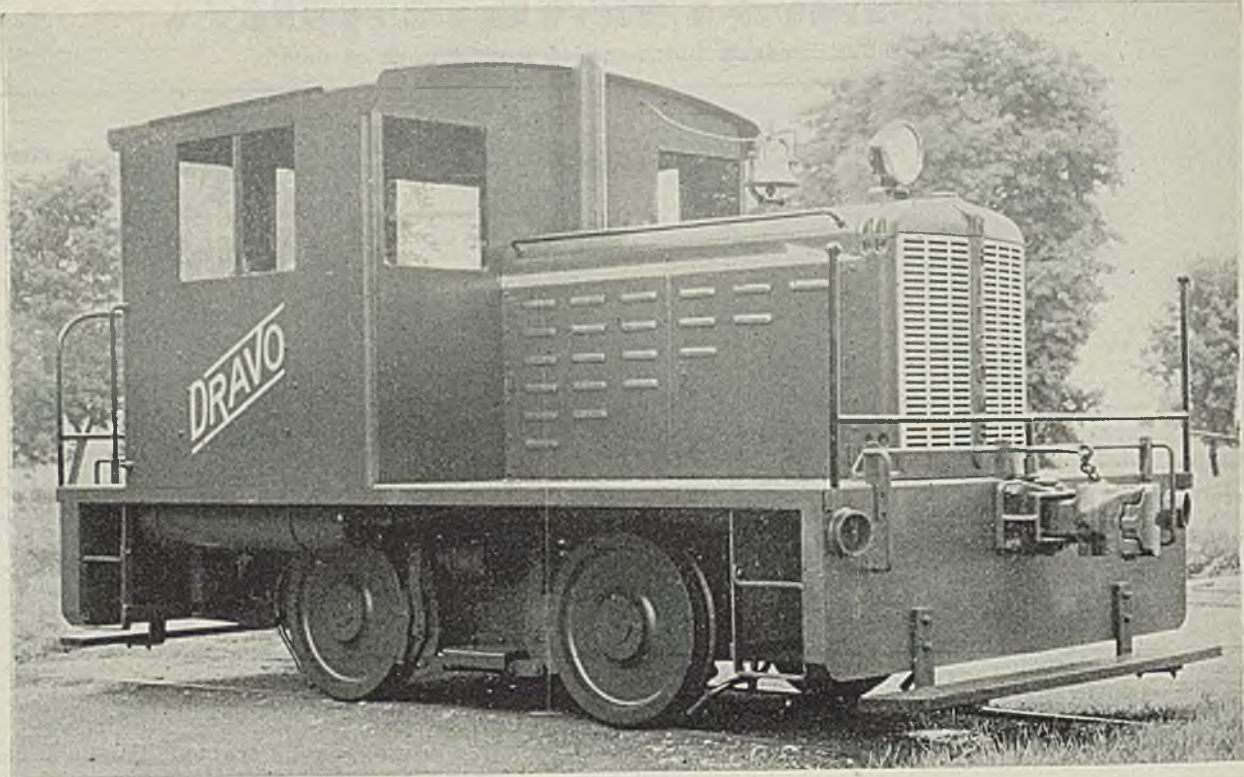
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