

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

ESTABLISHED 1882

Looking Forward to
1990 a.d.

IN

a few days our Fiftieth Anniversary Year will become history. As we launch into the second half of a century, with grateful hearts we acknowledge the confidence and loyalty of you who have consistently looked to us for your requirements, in spite of change, depression, reciprocity and concentrated corporate control. We pledge to continue our foundry service to your own requirements. Whether your needs be for castings to your own patterns, or for specialties made under license or under our own patents, our alert, intelligent personnel will continue to supply you with reliable castings of the highest quality, delivered promptly.

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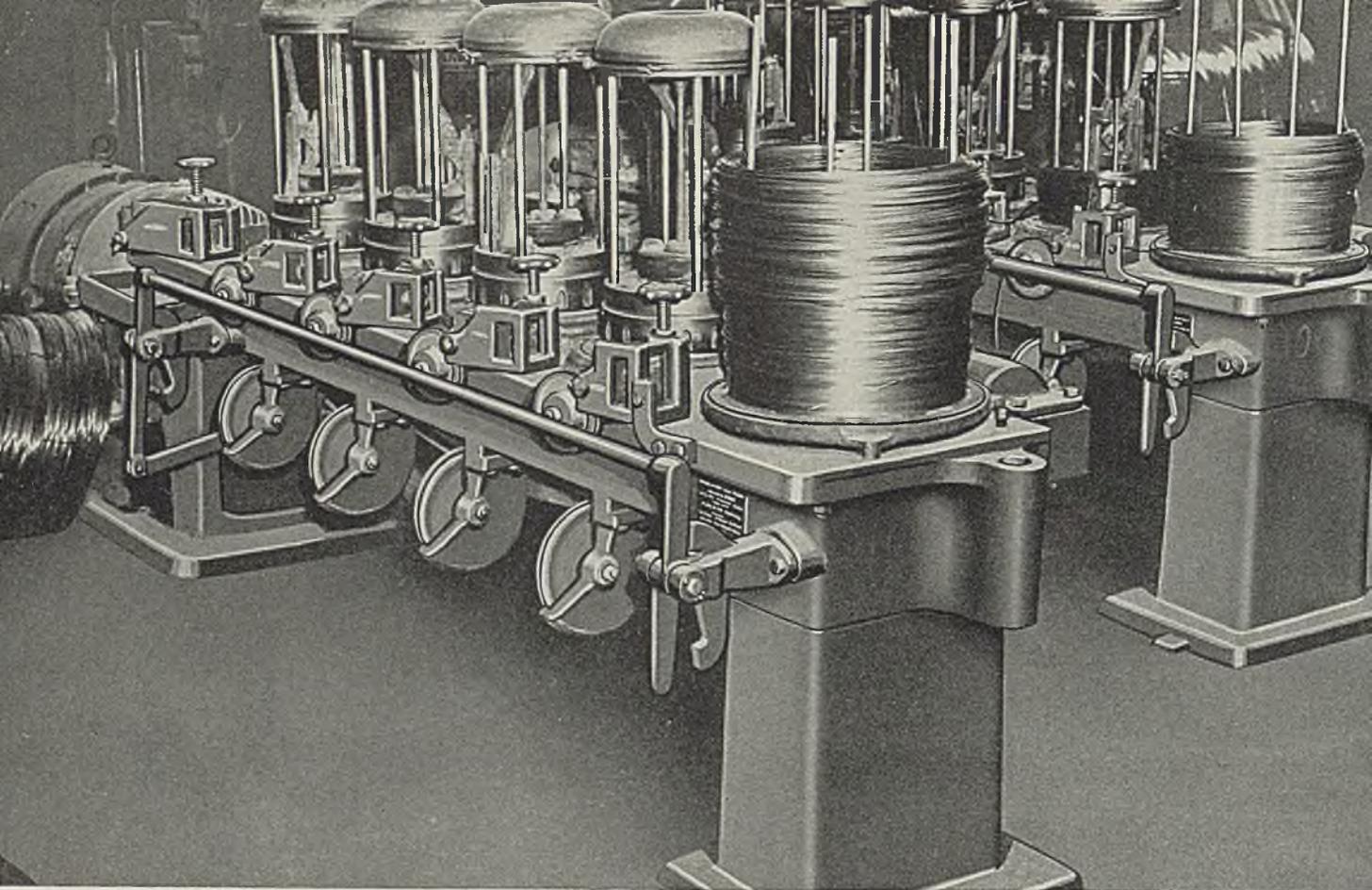
Falcon Shrouded Turbines

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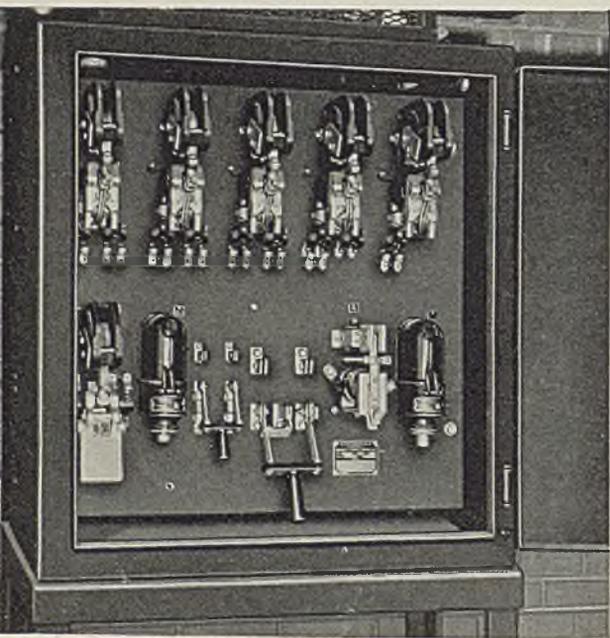
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STEEL

ESTABLISHED 1882

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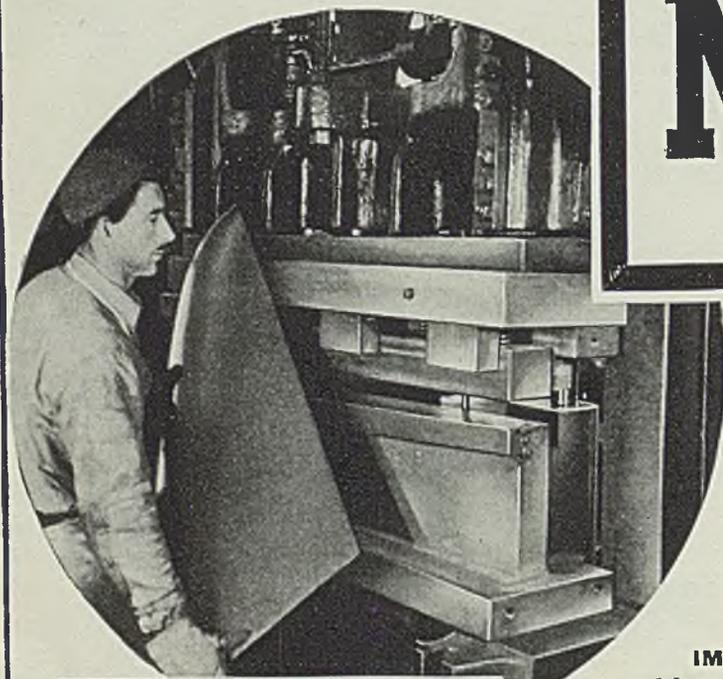
PRODUCTION • PROCESSING • DISTRIBUTION • USE

*30,000 stampings
... no redressing*

... USING DIES MADE OF

NICKEL

ALLOY IRONS



OVER 30,000 STAMPINGS

without regrinding is the record of dies like these in the plant of a large Canadian automobile plant. Made by the Dominion Wheel and Foundry Co. of Toronto, these dies are specified in Nickel-chromium-iron.

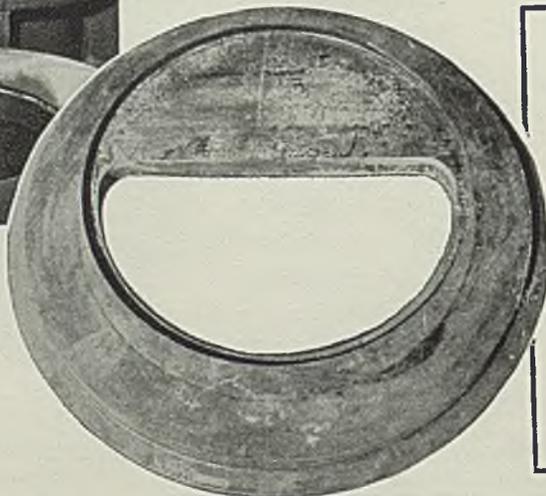
IMPROVED →

and long service life in forming cold stampings from 0.10" steel is assured in these dies made of "Ryanite," a Nickel alloy cast iron produced by the Allyn-Ryan Foundry Co., Cleveland, Ohio. Strong, hard and wear resistant, also resistant to heat and mild shock, Nickel cast irons are readily machined.



20 TO 1 SUPERIORITY

over plain cast iron in production of washing machine tubs is claimed for these heat treated Nickel-chromium cast iron dies cast by the Youngstown Foundry & Machine Co., Youngstown, Ohio. Fine grained Nickel alloyed irons take a high polish, eliminate galling and streaking of stamped parts.



OVER 2 TONS

in weight is this large alloy iron die cast by Utica Steam Engine Co., Utica, N. Y. Fine grain structure, good machinability, high hardness and wear resistance are assured by use of 2.50% Nickel and 0.80% chromium in the mixture.

Inquiries regarding die compositions and other tool making applications are invited.

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

HIGHLIGHTING THIS ISSUE

■ AWARDS in connection with the armament program continue to grow with each passing week (p. 17) and affect many diversified industries directly and indirectly. In addition, demand is increasing from other sources such as (p. 69) the automobile industry, the railroads, the construction field and from miscellaneous consumers. As a result the order backlogs of steel mills tend to become larger, with deliveries on certain products a little further in the future. At least some of the current buying is anticipatory due to fears of a steel shortage. Producers, on the other hand, believe present capacity is substantially adequate. . . Steel output last week (p. 21) continued unchanged at 93 per cent of ingot capacity.

. . .

The steel industry is expanding here and there is an effort to eliminate bottlenecks. Republic Steel Corp. announces (p. 30) a rather broad improvement program.

Scrap

Embargoed

. . . Edward L. Ryerson Jr. estimates (p. 22) that the defense program will call for about 5,000,000 tons of steel in 1942 and that not more than 6,000,000 to 7,000,000 tons will be needed in the peak year of the program. . . Long-awaited scrap embargo was announced last week (p. 13) by the President. Beginning Oct. 16 licenses may be obtained for exports only to Western Hemisphere countries and to Great Britain. . . A new "upgrading plan" is expected (p. 24) to augment the supply of skilled workers needed for the armament program.

. . .

Jesse H. Jones (p. 26) will try to make the department of commerce represent business and industry as the department of agriculture represents farmers and the department of labor represents labor. . . Defense plant construction is to be speeded (p. 14) by "bankable" government contracts. . . Galvanized roofing and siding may be used (p. 17) in construction of army

Costs May Increase

cantonments. . . Higher production costs, due to more overtime work, are in sight (p. 23) as a result of the incidence of military conscription and the reduction of the work-week ceiling to 40 hours. . . The Export-Import bank will make a loan of \$20,000,000 to Brazil (p. 14) for establishment of a steel plant in that country.

. . .

N. B. MacLaren and L. R. Mayo (p. 38) describe a procedure by which end-milling cutters were redesigned so as to remove stock in larger

Repairing Mill Parts

amounts, with less power consumption and with longer cutting life. It involved changing one factor at a time and thoroughly testing before taking the next step. The technique is widely applicable. . . . A New Jersey iron and steel warehouse (p. 42) employs an unusual overhead rail and hoist arrangement for handling steel tube and bar stock. . . . A new method for heating steel and nonferrous metals (p. 52) is based on the use of lithium as a neutralizing medium for furnace atmospheres. . . . A welding engineer (p. 57) discusses repair and reclamation of rolling mill parts.

. . .

Age-hardening of cold reduced strip for some years has been among the most interesting problems confronting metallurgists in the steel producing and consuming industries.

Avoiding Hardening

Paul J. McKimm (p. 44) after extended study of the practical aspects of this phenomenon, tells about trouble that results from skin passing sheets while they still are hot. With proper processing methods, he holds, age-hardening may be avoided. . . . A new type of equipment (p. 60) makes it easy to lift and move bulky machines and machine tools. . . . Heavy sections may be joined by "forge welding" (p. 64) in the same manner as sheets are joined by spot welding. . . Available is a new method (p. 63) for cleaning brass before plating.



Ryerson Night Loading Assures Quicker Deliveries

IT'S after hours, at any of the ten Ryerson steel plants, almost any night of the year!

The Ryerson night shift is putting the finishing touches on *today's* orders; loading out the fleet of big, red Ryerson trucks for tomorrow's deliveries.

Immediate Steel is a Ryerson tradition. The entire Ryerson organization is geared up to handle *quickly* the steel requirements, simple or involved, of thousands of customers the country over. Special telephone order desks, hourly mail pick-ups at the post office, telegraph and teletype lines right into our offices—all help to speed delivery, even *before* the order reaches us.

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Ryerson Steel Service is fast and sure; Ryerson Certified quality is your assurance of uniformity and exactness. Make the Ryerson Stock List your unfailing source for all steel requirements. If you haven't the latest Stock List we'll send one gladly.

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RYERSON

Scrap Embargo Unlikely To Disturb Domestic Market

Government Threatens Price Control Over Nonferrous Metals.

Export-Import Bank Lends Brazil \$20,000,000 for New Mill.

Army, Navy Awards Reflect Speedup in Defense Program.

United States Will Purchase Tungsten from China.

▣ EMBARGO on iron and steel scrap exports to other than Western Hemisphere countries and Great Britain is unlikely to be reflected in easing prices before Oct. 16 when the restriction goes into effect, according to scrap authorities. Some dealers predict a temporary strengthening, during the next two weeks, due to a rush to move tonnage before the deadline. After that, they say, price trends will depend on the ability of expanding national defense and general industrial activity to absorb tonnage which has been going abroad.

The administration's action in embargoing scrap exports caused little surprise among iron, steel and scrap men. It obviously has both economic and political causes and implications.

Closer control of foreign shipments had been urged by steel producers for the past several years, on the ground the metal was needed in this country.

Cessation of shipments to Japan, the leading buyer affected by the embargo, had been demanded by groups opposed to Japan's expansion and military policies.

Decision to put the embargo into effect was reached after consultation with the industrial materials division and the price stabilization division of the national defense advisory commission, the White House said. Text of the administration's announcement:

"The President has approved the early establishment of additional controls of the exportation of iron and steel scrap with a view to conserving the available supply to meet

the rapidly expanding requirements of the defense program in this country.

"Effective Oct. 15, 1940, all outstanding balances of licenses which have been granted pursuant to the existing regulations of July 26, 1940, for the exportation of No. 1 heavy melting steel scrap will be revoked. On Oct. 16, 1940, the exportation of all grades of iron and steel scrap will be placed under the licensing system.

"Under the new regulations which will be made effective on Oct. 16, 1940, licenses will be issued to permit shipments to the countries of the Western Hemisphere and Great Britain only."

Japan Largest Buyer

Japan, against whom the order was primarily directed, has been buying well over a million tons a year since 1934. From that year to Sept. 1, Japanese purchases from this country have totaled 9,320,418 gross tons. Last year's sales to the Nipponese were 2,026,854 gross tons, and in the first eight months this year, 666,371 tons.

Japanese steel production has been relatively high for the past several years and American authorities doubt if their reserve scrap stocks are large. Unshipped tonnage against old contracts, which must be shipped before the middle of the month, also are not considered large. Loading of this material on ships, however, will be expedited, especially at Gulf and West coast ports. Little scrap for Japan has been loaded at Atlantic ports recently.

Japan has been buying No. 2

heavy melting and bundles almost exclusively in recent weeks. Available supplies of these grades are expected to be absorbed by domestic requirements and probable heavier exports to Great Britain. The latter has been negotiating for 150,000 tons or more of this type scrap.

Total exports of iron and steel scrap during the first eight months this year were 2,142,176 gross tons, 12 per cent less than the 2,431,610 gross tons exported in comparable 1939 period.

Great Britain displaced Japan as the leading customer for the first eight months of 1940. This was caused by greatly increased purchases by England and lighter buying by Japan. Other leading scrap buyers in recent years have been Italy (until she entered the war) and Canada.

Embargo generally was approved by steelmakers, many of whom have been somewhat apprehensive of a future scrap shortage. Should national defense requirements keep steelmaking facilities operating at capacity, they contend, a shortage of the waste metal probably would occur and adversely affect the rearmament program.

Joseph E. Jacobson, president, Institute of Scrap Iron & Steel, said the institute is co-operating fully on the embargo. He said he did not believe it will affect domestic markets in any way.

The institute at New York pointed out its national officers and export committee have been in constant touch with the government in regard to requirements for the defense

program and exports to all nations. Its statement adds:

"Upon request, the institute recently submitted a quota plan which would have severely restricted exports in the interest of national defense. It has co-operated in formulating plans for licensing and stands ready now, as heretofore, to support the national policy."

The institute noted the decline in Japanese buying this year and said:

"Domestic consumption of scrap now is at a record monthly rate of 4,000,000 tons. Exports to Japan, now

about to be prohibited, have been equal to only 2½ per cent of American mill requirements thus far in 1940.

"Scrap dealers along the seacoast, where export material originates, are essential to the government program, because, in addition to scrap iron and steel, they also collect and prepare other waste materials which are considered strategic and critical. To preserve this part of the scrap industry it will be necessary for domestic consumers to absorb the surplus heretofore moving to Japan."

U. S. Lends \$20,000,000 for New Brazilian Steel Mill

WASHINGTON

Export-Import bank will make a loan of \$20,000,000 to Brazil for constructing a steel plant in that country, The Brazilian government and other interests also will invest \$25,000,000 in the project. The money to be loaned by the United States will be used for purchase in this country of materials and equipment.

Jesse H. Jones, federal loan administrator, in a letter to Dr. Guilherme Guinle, president of the Brazilian executive committee having charge of the plan, stated:

"The loan will be made by the Export-Import bank to the company which is to own and operate the mill and endorsed by the Bank of Brazil, and guaranteed by the Brazilian government. The loan will be payable in 20 semiannual installments the first of which will become due in the three years from date of first advance. Interests are payable semi-annually at 4 per cent and will run from the date each advance is made.

"Satisfactory provisions will be required to assure that the loan will

constitute a first claim against the mill and all legal matters in connection with the loan shall be subject to the approval of the Export-Import bank.

"We should also want the privilege of concurring in the selection of the managerial officers of the mill company, the engineers and contractors and the purchase of materials.

"The Export-Import bank will expect continuing assurances from the Bank of Brazil and the Brazilian government that the mill will be completed from the proceeds of the loan and funds to be supplied in Brazil and that the mill company will have ample working capital.

"In view of the fact that the experience of Brazilians in the manufacture of steel on a large scale has been limited, the management of the enterprise should include managerial officers and engineers experienced in the manufacture of steel in the United States until successful operation has been assured to the mutual satisfaction of the Export-Import bank and Brazilian investors.

Banks Ready To Loan Billions For Defense at Low Interest

WASHINGTON

COMMERCIAL banks throughout the country stand ready to lend at least \$3,000,000,000 to manufacturers for emergency defense plant construction, according to a test survey conducted by the federal reserve system for the national defense advisory commission. The survey, covering a representative portion of banks in each of the country's 12 federal reserve districts, indicates that these institutions have available and are

willing to lend an amount several times that which at present is believed required for building emergency production capacity.

Borrowings from the banks would be made by defense manufacturers in connection with a new form of contract developed by the national defense advisory commission.

Legislation now pending in congress to permit the assignment of claims against the government would allow manufacturers to as-

sign the contract as security for borrowings needed for defense plant construction. Because of the security thus afforded, interest rates should be lower than usual.

William S. Knudsen, of the national defense advisory commission, commented on the survey as follows:

"This 48-hour test mobilization of bank credit available for defense plant construction loans shows that the commercial banks of the country are eager to do their part in the national defense program. Not only are they eager, but they stand ready with funds far in excess of the amount needed for this purpose. As soon as the pending legislation has been passed which will allow the form of contract developed by the national advisory commission to be assigned as security for such loans, I believe that manufacturers needing to expand their plants on account of the defense program should have no trouble in obtaining funds for construction promptly and at low rates of interest through their usual banking connections."

Federal reserve authorities emphasized that in the two days during which the survey was made only a portion, although a representative one, of the nation's banks could be reached. The board of governors of the federal reserve system, working in co-operation with representatives of the defense advisory commission, described the plan by telegraphed messages to each of the 12 federal reserve banks and their 24 branches. Each was asked to explain the plan to representative banks in its territory.

Contract Protects Manufacturer

The banks were not asked to make firm or binding commitments, but merely to indicate the availability of their own funds at the present time and under present conditions, without reference to funds which might be obtained from correspondent banks or federal reserve banks on advances or discounts. It is expected that returns from other banks which were not included in the initial survey will add substantially to the total amount indicated as being available.

Specifically, the new contract has two purposes: To expedite signing of supplies contracts by the army and navy through assuring the contractor against loss on construction undertaken for military purposes; to safe-guard the government's interest in such facilities on termination or completion of the contract.

The plan provides that the government reimburse the contractor, not in additions to the unit price of the product purchased as heretofore, but in five equal annual installments covering the amount of his capital expansion costs. Thus, cost of supplies and amortization of construc-

tion cost by the government would be separated. Prices are thereby held at a minimum and, while the manufacturer is relieved of the risk involved in building fixed assets for the emergency, he still absorbs all the ordinary risks involved.

In other words, adoption of this plan assures that neither the private manufacturer nor the government would assume in advance all the risk, nor subsequently reap as a profit the residual value. The contract contains provisions whereby the contractor may, by purchase or

lease from the government, acquire use of the facilities for himself after they have served their purpose in connection with emergency defense needs.

It is expected that the plan will conserve government funds and stimulate investment of private capital in the defense construction program. At the same time, private manufacturers would provide management and operation and assume all the ordinary risks of the business. Government participation would be limited to actual expansion costs.

Metals Reserve Corp. To Buy Chinese Tungsten; Tin Stocks Rise

■ JESSE H. JONES, federal loan administrator, last week disclosed that Metals Reserve Corp. has agreed to buy tungsten to the value of \$30,000,000 from the national resources commission of China.

The tungsten will be delivered over a period of years at prices to be agreed upon from time to time, in accordance with market conditions. To assist China to meet her present foreign exchange needs, the Export-Import bank has agreed to lend China \$25,000,000 that will be liquidated through the sale of the tungsten. The loan will be made to the government of China, guaranteed by the Central Bank of China.

Reserve stocks of tin are being accumulated rapidly in the United States and current supplies either

already in the country or enroute are adequate to meet requirements for from nine to 12 months, according to Edward R. Stettinius Jr., of the defense commission.

A record total of 12,400 long tons of the metal, or about twice the amount ordinarily consumed in a month, arrived in the country during August and at the end of the month there was 22,364 long tons afloat to the United States. By Sept. 14 the navy, the procurement division of the treasury and the Reconstruction Finance Corp., through the Metals Reserve Corp., had purchased 13,694 long tons of tin under the government's stockpile program and more than 8000 tons already had been delivered.

Mr. Stettinius pointed out that

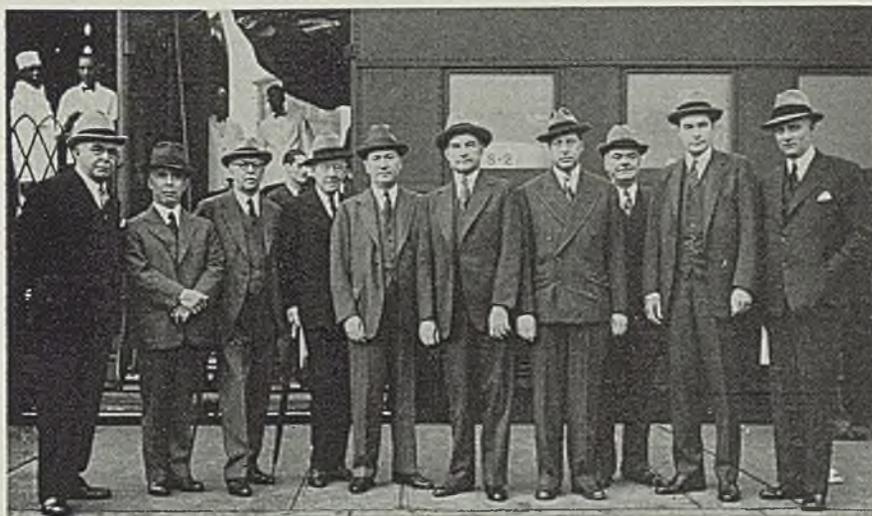
this country normally consumes 70,000 to 80,000 tons of tin a year and that these requirements will be increased substantially when full production is reached on tin plate, solder, bearings and other tin products required for defense equipment.

"This program of acquiring a stock pile of this strategic metal has been undertaken," he declared, "because virtually all of the tin now consumed in this country comes from British Malaya and the Dutch East Indies, and if shipments were interrupted owing to unsettled world conditions, industrial operations might be seriously retarded. It is essential to avoid the possibility of any shortages in supplies of basic materials required in the defense program." In order to expedite the accumulation of reserve stocks the defense commission made arrangements with the principal producers to increase mining operations.

As a second step in the program of insuring the nation against a possible tin shortage the industrial materials division and the Metals Reserve Corp. are holding conferences this week with various private groups which have expressed an interest in constructing a tin smelter in this country for processing Bolivian ore. Except for experimental plants, there are no smelting facilities at present either in Bolivia or in this country.

In addition, the commission is surveying the possible use of substitutes in some lines and an increase in scrap recovery. Ordinary tin cans are not available for scrap purposes but the normal reclamation of seven to eight thousand tons of "clean scrap" could be expanded somewhat.

U. S. Steel Officials Inspect Properties



■ United States Steel Corp. directors and officers recently inspected subsidiary properties in Pittsburgh, Chicago and Birmingham, Ala. Shown at their train in Chicago are, left to right: William A. Irvin, Robert C. Stanley, Nathan L. Miller, Thomas W. Lamont, B. F. Fairless, Irving S. Oids, Enders M. Voorhees, Leon Fraser, Junius S. Morgan, and George A. Sloan

GALVANIZED ROOFING, SIDING FOR ARMY CAMPS STUDIED

War department officials are much interested in the use of galvanized roofing and siding for cantonments which are now being put up in the various parts of the country for the new army.

It has been pointed out to the army officials as an over-all job galvanized roofing and siding can be used for cantonments at about the same price as lumber. It is said that the war department officials have been holding off using this material because they have thought it might cause difficulty in the steel mills. However, this matter has been thoroughly explained to them now by steel experts, and there is a good possibility that they will at least try out the galvanized steel products.

Despite many stories emanating from Washington at this time to the effect that the large defense buying program will create a steel shortage, industry experts who are

in Washington still maintain that there will be plenty of ingot capacity for everything needed. So many reports have been sent out of Washington recently that there has been talk that this might be deliberate propaganda. Some stories have even gone so far as to state a pos-

sible steel shortage is shown in surveys which have just been completed. Even steel experts in Washington who are working with the government say definitely that they know of no recent survey made which would indicate any such conclusion.

in the process is entirely advisory.

"I can say that we are as much opposed to the undue geographical concentration of defense orders as is the man who doesn't get one," he stated. "A system for placing orders is being worked out which we hope will give the widest possible geographic distribution consistent with the strategic and economic interests of the defense program. We do not do this for political purposes or for what are known as pork-barrel reasons. We do it in the interest of military strategy and to eliminate confusion with resultant slowing up of production. It is also hoped to stimulate decentralization of industry.

"Under our procedure for letting contracts, unemployment is a major consideration. We try to avoid orders being placed in communities where industrial facilities are at or near peak of production and unemployment is therefore at a minimum when other communities have idle or partially used facilities and a heavy burden of unemployment."

Nonferrous Markets Brisk, Government Threatens Control

■ HEAVY buying of nonferrous metals lately, coupled with a rising trend in prices, last week led to a warning by the national defense advisory commission regarding further price increases.

Defense commissioner Leon Henderson warned that "there is no justification for the recent unstable price situation" and that the government might have to intervene. Mr. Henderson stated that he would be "reluctant to recommend controls over these metals" but that he "is prepared to make adequate suggestions to the President as to what might be done under existing laws to correct the situation." Profits of the copper, lead and zinc industries have been "ample" in recent months and costs do not seem to be increasing, Mr. Henderson said, but added that "these factors may not be getting adequate consideration.

Demand has been particularly heavy for copper. September sales of 250,000 tons were 36 per cent more than the previous record of September a year ago. Fabricators have on order with refiners 325,000 tons of copper, possibly a record.

C. Donald Dallas, president, Revere Copper & Brass Inc., last week suggested that the rigid 4-cent copper excise tax be modified to permit free entry of foreign copper when the domestic producer price is 12.00c, with a sliding scale tax be applied below the 12-cent level. At less than 9.00 cents the full 4-cent tax would be applied. "By this method," he said, "imports of copper would be prohibited when our consumption is low, the market weak, and producers' domestic labor in need of all the available domestic business."

With active lead demand returning the domestic price to 5 cents, thereby permitting imports for consumption, an increasing amount of Mexican lead already in this country and lead from other parts of the world is being sold here. Producers' stocks of refined lead are equal to less than three weeks' shipment at the current rate. However, presence of over 100,000 tons of Mexican refined

lead here acts as a barrier against much higher prices and assures an adequate supply.

Zinc buyers have on order with smelters a near record 91,000 tons of common grades. This is about as much as sellers care to have, and with the price up to 7.25c, East St. Louis, buying is less insistent.

UNEMPLOYMENT FACTOR IN PLACING DEFENSE PLANTS

Don M. Nelson, co-ordinator for national defense purchases, said last week that one of the first considerations to defense contracts at present is speed of delivery.

Mr. Nelson called attention to the fact that the defense commission does not determine the location of new plants and facilities. That, he said, is the responsibility of armed services, and the commission's part

■ More than 64 centuries of service by 217 employes was recognized by the American Steel & Wire Co. at a luncheon at its American works, Cleveland, Saturday, Sept. 28. The employes, who have service records ranging from 25 to 50 years, totaling 6425 years, were awarded United States Steel Corp. service medals at ceremonies following the luncheon.

Stamping Plant Builds Shells for Defense



■ Three-inch shells are measured by an employe in a Los Angeles stamping plant, a part of which has been turned over for the manufacture of defense materials. Acme photo

Defense Awards \$600,702,970;

Heavy Goods Well Represented

■ NATIONAL defense awards announced by the war and navy departments last week aggregated \$600,702,970, reflecting a sharp speedup in the rearmament program. The total included several large construction programs as well as large orders for heavy ordnance material, mechanized ground units and airplanes and engines.

War department announced the following awards:

American Car & Foundry Co., Berwick, Pa., tanks, \$10,352,745.
American Locomotive Co., New York, tanks, \$32,070,000.
Auto Specialties Mfg. Co., St. Joseph, Mich., ammunition components, \$1,653,750.
Baldwin Locomotive Works, Philadelphia, tanks, \$33,335,500.
Bendix Aviation Corp., Bendix, N. J., ammunition components, \$10,140,000.
Edward G. Budd Mfg. Co., Philadelphia, ammunition components, \$2,704,026.
Budd Wheel Co., Detroit, ammunition components, \$1,582,680.
Colorado Fuel & Iron Corp., Pueblo, Colo., ammunition components, \$4,536,000.
Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., artillery material, \$1,700,000.
Crosby Co., Buffalo, ammunition components, \$1,160,000.
Gar Wood Industries Inc., Detroit, artillery material, \$3,784,364.
Indiana Ordnance Works, Charlestown, Ind., smokeless powder, \$23,050,000.
Kennedy Van-Saun Mfg. Co. Danville, Pa., artillery material, \$638,274.15.
Radford Ordnance Works, Radford, Va., smokeless powder, \$24,550,000.
Ravenna Ordnance Works, Ravenna, O., ammunition, \$28,000,000.
Remington Arms Co., Bridgeport, Conn., small arms ammunition, \$88,700,000.
Robertshaw Thermostat Co., Youngwood, Pa., ammunition components, \$1,493,100.
Sanderson & Porter, New York, construction of ammunition loading plant near Wilmington, Ill., at estimated cost of \$14,000,000.
Savage Arms Corp., Utica, N. Y., small arms material, \$27,166,283.50.
Scoville Mfg. Co., Waterbury, Conn., ammunition components, \$1,034,000.
Scripto Mfg. Co., Atlanta, Ga., ammunition components, \$1,094,000.
Sperry Gyroscope Co. Inc., Brooklyn, N. Y., fire control equipment, \$6,534,920.36.
Timken Detroit Axle Co., Detroit, Mich., artillery material, \$834,599.40.
Vilter Mfg. Co., Milwaukee, artillery material, \$641,920.
Western Cartridge Co., East Alton, Ill., small arms ammunition, \$89,873,337.50.

Aircraft Awards

American Gas Accumulator Co., Elizabeth, N. J., floodlight assemblies, \$474,000.
Bausch and Lomb Optical Co., Rochester, N. Y., octants, \$134,400.
Bendix Aviation Corp., Bendix Products division, South Bend, Ind., carburetor assemblies, \$191,167.10; Pioneer Instrument division, Bendix, N. J., octants, \$129,350; Eclipse Aviation division, Bendix, N. J., energizer assemblies, generator and regulator assemblies, \$1,161,863.65.
Chandler-Evans Corp., South Meriden, Conn., fuel and vacuum pumps, \$106,560.
Clark Equipment Co., Clark Tractor division, Battle Creek, Mich., tractors, \$743,457.50.

Consolidated Aircraft Corp., San Diego, Calif., airplanes and spares, \$85,800,000.
Continental Motors Corp., Muskegon, Mich., engineer maintenance parts, \$76,989.25.
Crouse-Hinds Co., Syracuse, N. Y., floodlight assemblies, \$74,443.50.
Curtiss-Wright Corp., Clifton, N. J., propeller blade assemblies, \$307,196.80.
Fairchild Engine & Airplane division, Fairchild Aircraft Corp., Hagerstown, Md., airplanes, \$6,672,200.
Hell Co., Milwaukee, Wis., trailers, \$2,114,594.
Kline Mfg. Co., Columbus, O., windless assemblies, \$56,250.
Lake State Products Inc., Jackson, Mich., propeller hub assemblies, \$15,750.
Leece-Neville Co., Cleveland, generator and regulator assemblies, \$934,389.
Lights Incorporated, Alhambra, Calif., field lighting sets, \$1,291,800.
Ohio Chemical & Mfg. Co., Cleveland, oxygen masks, \$65,037.15.
Philadelphia Air Transport Co., Norristown, Pa., film developed assemblies, \$67,104.
Pump Engineering Service Corp., Cleveland, fuel and vacuum pumps, \$623,895.
Ryan Aeronautical Corp., San Diego, Calif., airplanes, \$5,355,087.
Standard Steel Works, Kansas City, Mo., trailers, \$1,182,005.20.
Star Machine Manufacturers Inc., Bronx, N. Y., solenoid assemblies, \$15,000.
Steel Products Engineering Co., Springfield, O., propeller hub assemblies, \$13,950.
Thompson Products Inc., Cleveland, fuel and vacuum pumps, \$105,400.
United Aircraft Corp., Hamilton Standard Propeller division, East Hartford, Conn., control assemblies and propeller blade assemblies, \$537,245.20.
Weaver Mfg. Co., Springfield, Ill., engine holsts, \$84,000.
Webster Electric Co., Racine, Wis., solenoid assemblies, \$65,672.
Yale & Towne Mfg. Co., Stamford, Conn., fuel pumps, \$63,377.26.

Corps of Engineers Awards

Abrams Instrument Co., Lansing, Mich., stereoscopes, \$8415.
American Type Founders Corp., Elizabeth, N. J., lithographic presses, \$6277.
American Steel & Wire Co., Cleveland, barbed wire, \$8084.
Bausch & Lomb Optical Co., Rochester, N. Y., projectors, \$16,425.
Belknap Hardware Co., Louisville, Ky., miscellaneous tools, \$4967.50.
Camillus Cutlery Co., New York, engineer knives, \$35,849.64.
Caterpillar Tractor Co., Peoria, Ill., tractors and graders, \$74,863.39.
Crown Iron Works Co., Minneapolis, pontoon sets, \$331,740.
Eugene Dietzgen & Co., Chicago, surveying equipment, \$52,756.75.
Haffner-Thrall Car Co., Chicago, railroad cars, \$15,087.
Ingersoll-Rand Inc., New York, air compressors, \$31,576.
International Harvester Co., Chicago, tractors, \$6566.26.
Keuffel & Esser Co., Hoboken, N. J., protractors, \$21,200.
LeTourneau Inc., Peoria, Ill., construction equipment, \$12,104.
H. P. Nelson Iron Works Inc., Passaic, N. J., loaders \$11,055.
Pittsburgh Steel Co., Pittsburgh, barbed wire, \$44,619.50.
L. S. Sterrett Co., Athol, Mass., straightedges, \$5125.50.
Wood Roadmixer Co., Cheyenne, Wyo., roadmixers, \$9422.

Quartermaster Corps Awards

Joseph A. Bass Co. and W. C. Smith Co. Inc., Minneapolis, temporary housing facilities at Lowry Field, Denver, \$523,680.
Buda Co., Harvey, Ill., diesel engine, \$39,932.
Diamond T. Motor Car Co., Chicago, trucks and busses, \$1,597,456.80.
Equitable Equipment Co. Inc., New Orleans, steel cargo barge, single screw diesel, steel tug, \$128,550.
Fargo Motor Corp., Detroit, trucks, \$4,780,591.80.
General Motors Corp., Detroit, trucks, \$3,089,304.29.
Hall-Scott Motor Car Co., Berkeley, Calif., gasoline engine, \$90,000.
Harley Davidson Motor Co., Milwaukee, motor-tricycles, \$2260.
Indian Motorcycle Co., Springfield, Mass., motor-tricycles, \$1700.
Kermath Mfg. Co., Detroit, gasoline and diesel engines, \$77,659.90.
Layne Ohio Co., Columbus, O., water wells at Patterson Field, Ohio, \$1955.
Manhattan Construction Co., Muskogee, Okla., air corps hangars, Chanute Field, Ill., \$136,880.
M. J. B. Construction Co., Stockton, Calif., sewer system, sewage disposal plant and pumping station at Stockton airport, California, \$35,750.
Martin K. Eby Construction Co., Wichita, Kans., fireproofing ceiling of hangar, Marshall field, Fort Riley, Kans., \$8390.
National Supply Co., Holmesburg, Philadelphia, diesel engine, \$173,000.
Newman & Carlson, San Francisco, addition and alterations to hospital at Moffet Field, California, \$43,157.
A. J. Paretta Construction Co., Long Island City, N. Y., temporary housing, \$594,169.
Reo Motor Car Co., Lansing, Mich., trucks, \$281,800.
Sheppard & Pollak Inc., New York, temporary housing, \$82,160.
Thompson Construction Co., Albany, N. Y., temporary housing, \$316,800.
Wainson Automotive Equipment Co., Washington, ambulances, \$9438.25.
Watt & Sinclair, Palm Beach, Fla., hospital, Orlando municipal airport, Florida, \$129,300.
Yellow Truck & Coach Mfg. Co., Pontiac, Mich., trucks, \$12,491,797.68.

Signal Corps Awards

American Automatic Electric Sales Co., Chicago, telephones, \$459,140.
Connecticut Telephone & Electric Co., Meriden, Conn., telephones, \$540,499.96.
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., telephones, \$412,500.
Western Electric Co., New York, telephones, \$445,500.

Medical Department Awards

Austenal laboratories, New York, bone plates and bone screws, \$56,880.
Fred Haslam & Co. Inc., Brooklyn, N. Y., surgical instruments, \$87,890.
Penn Surgical Mfg. Co., Philadelphia, surgical instruments, \$6050.
Picker X-Ray Corp., New York, X-ray equipment, \$11,900.
Royal Typewriter Co. Inc., Brooklyn, N. Y., typewriters, \$5152.20.
Serval Inc., New York, refrigerators, \$12,724.80.
J. Sklar Mfg. Co., Long Island City, N. Y., surgical instruments, \$104,962.50.
Taylor Instrument Co., Rochester, N. Y., sphygmomanometers, \$30,000.
Edward Week & Co. Inc., Brooklyn, N. Y., forceps, \$65,550.
Westinghouse X-Ray Corp., Long Island City, N. Y., X-ray table units, \$27,400.

Ordnance Department Awards

American Brake Shoe & Foundry Co., Chicago, ammunition components, \$244,110.
American Car & Foundry Co., Berwick, Pa., tank components, \$6300.

Baird Machine Co., Bridgeport, Conn., machines, \$3352.50.

John Bath & Co. Inc., Worcester, Mass., gages, \$19,197.60.

Barwood and Co., Philadelphia, gages, \$76,522.

Braun Gear Corp., Brooklyn, N. Y., gears, eccentric drive, \$95,329.27.

E. W. Bliss Co., Brooklyn, N. Y., presses, \$49,950.

Edward G. Budd Mfg. Co., Philadelphia, body assemblies for bombs, \$847,443.18.

Boyar-Schultz Corp., Chicago, gages, \$7035.

Canister Co., Phillipsburg, N. J., containers, \$4115.75.

Carnegie-Illinois Steel Corp., and American Steel & Wire Co., Cleveland, steel for ammunition, \$62,382.65.

Cleveland Container Co., Philadelphia, containers, \$150,363.99.

Davenport Bessler Corp., Davenport, Iowa, flanges, \$1081.

Dollin Corp., Irvington, N. J., base blocks, \$4850.

Dover Boiler Works, Dover, N. J., machinery components and filter, \$11,542.

Dover Tank & Stack Co., Dover, N. J., tub, \$1518.

Eclipse Air Brush Co. Inc., Newark, N. J., machines, \$1800.

Electric Arc Cutting & Welding Co., Newark, N. J., electric generators, \$1195.

Electrix Corp., Pawtucket, R. I., gages, \$6193.76.

George D. Ellis & Sons, Inc., Philadelphia, ammunition components, \$1674.

Essex Specialty Co. Inc., Berkeley Heights, N. J., flares, \$344,920.

Fox Munitions Corp., Philadelphia, gages, \$5276.30.

Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$16,991.65.

Greenlee Bros. & Co., Rockford, Ill., planers, \$8106.

Hanson-Whitney Machine Co., Hartford, Conn., gages, \$17,093.92.

Herbach & Rademan Inc., Philadelphia, transcription units, \$10,997.58.

Herman Nelson Corp., Moline, Ill., small arms, \$13,631.76.

Hershey Metal Products Inc., Derby, Conn., steel for ammunition, \$45,600.

Improved Malling Case Co., Brooklyn, N. Y., containers, \$10,924.

Johnson Tool Co., Chicago, inspection gages, \$1506.86.

Kilgore Mfg. Co., International Flare-Signal division Tippecanoe City, O., ammunition components, \$163,200.

LaPlant-Choate Mfg. Co. Inc., Cedar Rapids, Iowa, angle dozers for use on caterpillar tractors, \$1147.50.

Lloyd & Arms Inc., Philadelphia, presses, \$15,830.

Modern Tool & Die Corp., Philadelphia, gages, \$2552.

Molded Insulation Co., Philadelphia, ammunition components, \$3075.

National Fireworks Inc., West Hanover, Mass., ammunition components, \$81,180.

Norton Co., Worcester, Mass., machines, \$1408.

Onsrud Machine Works Inc., Chicago, lathes, \$30,753.

Peterson Bros. Tool Co., Milford, Mass., gages, \$2533.

Pennsylvania Tool & Mfg. Co., York, Pa., gages, \$14,684.

Pratt & Whitney division, Niles-Bement-Pond Co., gages \$9645.36.

Precision Mfg. Co., Philadelphia, gages, \$8242.

R. & M. Mfg. Co., Royal Oak, Mich., gages, \$10,153.50.

Robinson Mfg. Co., Muncy, Pa., sand screening machines, \$1495.

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

Sheffield Gage Corp., Dayton, O., gages, \$16,800.

Standard Machinery Co., Providence, R. I., artillery material, \$13,534.

Standard Pressed Steel Co., Jenkintown, Pa., ammunition components, \$19,435.

Swanson Machine Co., Jamestown, N. Y., ammunition components, \$87,320.42.

Templeton, Kenley & Co., Chicago, jacks, \$9360.

U. S. Automatic Corp., Amherst, O., plugs for booster, \$35,127.

Vernon Co., Publix Metal Goods Corp., New York, signal equipment, \$3094.14.

Vinco Corp., Detroit, gages, \$13,730.40.

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., loading machine parts, \$15,000.

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., machines, \$4000.

Westinghouse Electric Supply Co., Albany, N. Y., electric motors, \$3735.60.

Wright Aeronautical Corp., Paterson, N. J., engines, \$3,121,680.

Union Parts Mfg. Co., Brooklyn, N. Y., ammunition components, \$1950.

Navy department announced the following contracts:

Alemite Co. of Maryland, Baltimore, gun fittings, \$24,104.30.

Allis-Chalmers Co., Milwaukee, ordnance material, \$178,350.

All-Steel Equipment Co. Inc., Aurora, Ill., metal lockers, \$11,411.80.

Aluminum Co. of America, Pittsburgh, aluminum alloy, \$61,500.

American Brass Co., Waterbury, Conn., copper nickel alloy tubing, \$80,911.96.

Associated Shipbuilders, Seattle, self-propelled lighter, \$314,350.

Baker Raulang Co., Cleveland, crane truck, \$5,895.

Bendix Radio Corp., Baltimore, radio equipment, \$9353.42.

Berger Mfg. Division, Republic Steel Corp., Canton, O., metal lockers, \$63,085.

Bethlehem Steel Co., Bethlehem, Pa., ordnance material, \$3,405,852.

Bullard Co., Bridgeport, Conn., boring mills, \$134,600.34.

Camden Forge Co., Camden, N. J., ordnance material, \$116,893.56.

Chapman Valve Mfg. Co., Indian Orchard, Mass., valves, \$120,272.

Cleveland Crane & Engineering Co., Wickliffe, O., 3-ton crane and 2-ton monorail, \$3570.

Purchases Under Walsh-Healey Act

Iron and Steel Products	Commodity	Amount
Air Conditioning & Refrigeration Supplies Inc., Charleston, W. Va.	Stand assemblies	\$18,843.20
Allegheny Ludlum Steel Corp., Watervliet, N. Y.	Tool steel	10,960.73
American Bridge Co., Ambridge, Pa.	Gates, gun emplacements	27,442.00
American Car & Foundry Co., New York	Bridge parts	17,158.00
American Cast Iron Pipe Co., Kansas City, Mo.	Cast iron pipe	*24,757.00
American Locomotive Co., New York	Forgings	118,800.00
American Steel & Wire Co., Chicago	Steel	64,134.28
Babcock & Wilcox Tube Co., Beaver Falls, Pa.	Steel tubing	18,802.66
Bethlehem Steel Co., San Francisco	Steel	23,679.54
Carey Machinery & Supply Co., Baltimore	Miscellaneous tools	10,244.51
Carnegie-Illinois Steel Corp., Chicago	Galvanized iron	10,464.36
Carnegie-Illinois Steel Corp., Pittsburgh	Steel forgings	213,775.00
Cincinnati Tool Co., Cincinnati	Bridge equipment	15,412.07
Columbian Steel Tank Co., Kansas City, Mo.	Liquid containers	46,000.00
Columbus Bolt Works Co., Columbus, O.	Wedges	32,480.80
Crucible Steel Co. of America, New York	Tool steel	29,325.50
Eastern Steel Tank Corp., Brooklyn, N. Y.	Gasoline tanks	22,910.00
H. Brinton Co., Philadelphia	Telescope mounts	19,744.50
Henry Diston & Sons Inc., Philadelphia	Armor plate	68,006.40
Inland Steel Co., Chicago	Steel	19,553.28
John A. Roebling's Sons Co., Trenton, N. J.	Wire cloth	23,024.80
Latrobe Electric Steel Co., New York	Tool steel	22,563.60
Marshall Stove Co., Lewisburg, Tenn.	Heating stoves	21,120.00
Midvale Co., Philadelphia	Tube forgings	101,080.00
Milton Mfg. Co., Milton, Pa.	Nuts	63,143.50
Noland Co. Inc., Washington	Bath tubs	11,386.00
Northern Iron Works, Glenside, Pa.	Fence, gates	18,351.00
Oregon Culvert & Pipe Co., Portland, Ore.	Metal pipe	18,147.60
P. R. Mallory & Co. Inc., Indianapolis	Shackle releases	340,020.00
Pennsylvania Forge Corp., Philadelphia	Forgings	76,250.00
Pressed Steel Car Co. Inc., Pittsburgh	Forgings	119,832.00
Reed & Prince Mfg. Co., Worcester, Mass.	Wood screws	26,418.61
Republic Steel Corp., Massillon, O.	Steel	61,757.60
Sandusky Foundry & Machine Co., Sandusky, O.	Shaft sleeves	119,979.24
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.	Pig iron	10,076.10
Struthers Wells-Titusville Corp., Titusville, Pa.	Forgings	489,437.00
Transue & Williams Steel Forging Corp., Alliance, O.	Connections	221,373.00
United-Carr Fastener Corp., Cambridge, Mass.	Hand tools	11,743.91
United States Pipe & Foundry Co., Philadelphia	Cast iron pipe	89,837.86
Virginia Bridge Co., Roanoke, Va.	Bridge parts	20,056.00
W. S. Rockwell Co., New York	Forge furnaces	49,480.00
York Safe & Lock Co., York, Pa.	Guns	719,198.97
Youngstown Sheet & Tube Co., Youngstown, O.	Wire nails	13,142.55
Nonferrous Metals and Alloys		
Aluminum Co. of America, Pittsburgh	Conductor, caps	\$78,040.61
Aluminum Products Co., La Grange, Ill.	Coffee boilers	11,670.00
American Brass Co., Waterbury, Conn.	Bar brass	18,161.43
Bart Laboratories, Belleville, N. J.	Mirrors & molds	604,000.00
General Electric Co., Schenectady, N. Y.	Stranded cable	60,282.00
General Time Instruments Corp., LaSalle, Ill.	Pins, screws	10,098.00
Harvey Metal Corp., Chicago	Body forgings	90,930.00
Metallite Mfg. Co., Los Angeles	Aluminum mess trays	10,750.00
Revere Copper & Brass Inc., Baltimore	Copper, brass	14,498.54
Scovill Mfg. Co., Waterbury, Conn.	Body forgings	47,575.00
Walter Kidde & Co. Inc., New York	Fire extinguishers	105,435.00
Wolverine Tube Co., Detroit	Condenser tubes.	34,099.00
W. P. Fuller & Co., San Francisco	Lead	30,384.00

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Clyde Iron Works Inc., Duluth, Minn., steam driven winches, \$73,890.
 Consolidated Machine Tool Corp., Rochester, N. Y., vertical slotter, \$8830.
 Consolidated Steel Co., Orange, Tex., for facilities, \$4,600,000.
 Crane Co., Chicago, high pressure valves, \$27,932.
 Crucible Steel Co., Harrison, N. J., ordnance material, \$5,729,543.02.
 Deput Mfg. Co., Warsaw, Ind., aluminum pole litters, \$22,900.
 Doehler Metal Furniture Co. Inc., New York, steel bunks, \$41,673.60.
 Durablitt Steel Locker Co., Aurora, Ill., metal lockers, \$17,988.
 Electric Boat Co., Bayonne plant, New Jersey, 12 motor torpedo boats and 12 patrol boats, \$6,502,000.
 Electric Boat Co., Groton, Conn., for expansion of shipbuilding facilities, \$2,750,000.
 Elgin National Watch Co., Elgin, Ill., aircraft clocks, \$35,088.45.
 Erie Forge Co., Erie, Pa., ordnance material, \$1,162,366.40.
 Euclid Crane & Hoist Co., Euclid, O., 10-ton crane, \$20,635.

General Electric Co., Schenectady, N. Y., blading materials, \$327,881.44.
 Hardinge Brothers Inc., Elmira, N. Y., lathes, milling machines, \$12,258.
 Heald Machine Co., Worcester, Mass., grinding machine \$7411.
 Heppenstall Co., Pittsburgh, ordnance material, \$832,996.69.
 The Hickok Electrical Instrument Co., Cleveland, Indicators, switches, \$33,000.
 Holmes Projector Co., Chicago, sound motion picture equipment, \$23,946.16.
 Imperial Machine & Foundry, Lindenhurst, Long Island, N. Y., peeling machines, \$13,276.
 Insigner Machine Co., Philadelphia, dishwashing machines, \$32,755.
 Kearney & Trecker Corp., Milwaukee, milling machines, \$16,686.75.
 Kollsman Instrument Division, Square D Co., Elmhurst, N. Y., a/speed indicators, \$27,500.
 Lewis Engineering Co., Naugatuck, Conn., indicators, switches, \$41,580.
 Lindberg Engineering Co., Chicago, heat-treating furnaces \$26,294.
 Magnaflux Corp., Chicago, inspection equipment, \$11,501.33.

Manitowoc Shipbuilding Corp., Manitowoc, Wis., for expansion of shipbuilding facilities, \$1,000,000.
 Manning, Maxwell & Moore Inc., Bridgeport, Conn., high pressure valves, \$46,378.62.
 Jas. P. Marsh Corp., Chicago, pressure gages, \$21,596.69.
 Fred Medart Mfg. Co., St. Louis, metal lockers, \$45,440.
 Midvale Co., Nicetown, Philadelphia, ordnance material, \$12,334,375.31.
 Alexander Milburn Co., Baltimore, cylinder regulators, \$43,175.
 Mine Safety Appliance Co., Pittsburgh, portable tools, \$592,715.49.
 Monarch Machine Tool Co., Sidney, O., lathes, \$125,982.
 National Forge & Ordnance Co., Irvine, Pa., ordnance material, \$1,006,003.80.
 Pacific Bridge Co., San Francisco, floating dry dock at Mare Island navy yard, California, \$1,649,000.
 Pacific Dry Dock & Repair Co., San Francisco, self-propelled lighter, \$284,572.
 Pacific Marine Supply Co., Seattle, portable gasoline engine driven pumps, \$13,053.
 Pennsylvania Forge Co., Philadelphia, ordnance material, \$268,640.74.
 Premier Bed & Spring Co., San Francisco, steel bunks, \$16,167.50.
 Henry Prentiss & Co. Inc., New York, boring, drilling and milling machines, \$33,298.
 Prometheus Electric Corp., New York, mess equipment, \$5311.92.
 Revere Copper & Brass Inc., Baltimore, copper tubing, \$96,359.52.
 Robert I. Steen Co. Inc., San Diego, Calif., bakery equipment, \$24,455.16.
 Seattle-Tacoma Shipbuilding Co., Seattle, for facilities, \$4,600,000.
 Wm. Sellers & Co. Inc., Philadelphia, planer, double housing, \$42,127.
 Simmons Co., New York, steel bunks, \$11,754.
 Skolnick Building Corp., New York, extensions at Washington navy yard, \$837,555.
 Smith-Courtney Co., Richmond, Va., universal grinder, \$7939.
 Struthers Wells-Titusville Corp., Titusville, Pa., ordnance material, \$184,295.
 Sullivan Dry Dock & Repair Corp., Brooklyn, N. Y., self-propelled lighter, \$289,000.
 Teletype Corp., Chicago, character transmission systems, \$49,386.
 United Aircraft Corp., Vought-Sikorsky Aircraft division, Stratford, Conn., spare parts for airplanes, \$29,282.98.
 United States Gauge Co., New York, a/speed indicators, \$122,000.
 J. W. Wells Lumber Co., Montgomery, Ala., boat-planking, \$9931.50.
 Weston Electrical Instrument Corp., Newark, N. J., indicators, switches, \$34,180.
 Wire Rope Corp. of America, New Haven, Conn., wire target towing hawsers, \$18,275.
 Worley & Co., Pico, Calif., metal lockers, \$21,756.

Purchases Under Walsh-Healey Act (Cont.)

Machinery and Other Equipment

A. B. Farquhar Co. Ltd., York, Pa.	Straightening press	\$13,650.00
Allis-Chalmers Mfg. Co., Milwaukee	Tractors	1,196,409.00
American Type Founders Sales Corp., Elizabeth, N. J.	Rotary presses	12,550.00
Austin-Hastings Co. Inc., Cambridge, Mass.	Drill presses	74,991.49
B. F. Sturtevant Co., Chicago	Heating system	10,044.00
Brown & Sharpe Mfg. Co., Providence, R. I.	Screw, milling machines	174,315.00
Bucyrus-Erie Co., South Milwaukee, Wis.	Well drills	21,552.36
Buda Co., Harvey, Ill.	Earth boring machine	273,744.00
Bullard Co., Bridgeport, Conn.	Turret lathe	15,525.47
Caterpillar Tractor Co., Peoria, Ill.	Patrol graders	*31,720.00
Chambersburg Engineering Co., Chambersburg, Pa.	Drop hammer	14,600.00
Cincinnati Mill. Mach. & Cinc. Grinders Inc., Cincinnati	Milling machines	295,334.00
E. L. Essley Machine Co., Chicago	Honing machine	30,348.00
E. W. Bliss Co., Brooklyn, N. Y.	Draw presses	26,600.00
Evinrude Motors, Milwaukee	Outboard motors	29,246.44
Gallon Iron Works & Mfg. Co., Gallon, O.	Road graders	235,351.00
Gisholt Machine Co., Madison, Wis.	Turret lathes	40,297.00
Hanson-Whitney Machine Co., Hartford, Conn.	Milling machines	12,561.00
Heald Machine Co., Worcester, Mass.	Boring machine	11,641.84
Henry Prentiss Co., New York	Grinding machines	14,196.00
Ingersoll-Rand Co., New York	Saws, paving breakers	102,342.36
International Harvester Co., Chicago	Tractors	2,272,500.00
Kingsbury Machine Tool Corp., Keene, N. H.	Drilling machine	11,557.00
Lapointe Machine Tool Co., Hudson, Mass.	Broaching machines	12,672.00
Le Roi Co., Milwaukee	Air compressors	1,209,920.00
Link-Belt Speeder Corp., Chicago	Shovels	302,941.00
Mall Tool Co., Chicago	Band saws	121,000.00
Marlon Steam Shovel Co., Marlon, O.	Shovel	60,000.00
National Acme Co., Cleveland	Spindle machines	35,272.60
National Twist Drill & Tool Co., Detroit	Twist drills	18,333.30
Niles-Bement-Pond Co., Pratt & Whitney division, Hartford, Conn.	Milling machines	31,488.00
Niles Tool Works Division, General Machinery Corp., Hamilton, O.	Turning lathes	172,500.00
Northwest Engineering Co., Chicago	Shovels	43,524.00
Osgood Co., Marlon, O.	Power shovel	20,217.00
R. K. Le Blond Machine Tool Co., Cincinnati	Boring lathes	108,911.20
R. L. Harris Inc. Knoxville, Tenn.	Tractors	19,627.00
Ransome Concrete Machinery Co., Dunellen, N. J.	Concrete mixers	41,860.50
Reed-Prentice Corp., Worcester, Mass.	Lathes, saws	232,670.00
S. Morgan Smith Co., York, Pa.	Valves and turbines	790,625.00
Sager-Spuck Supply Co. Inc., Albany, N. Y.	Lathe	19,498.00
Silent Hoist Winch & Crane Co., Brooklyn, N. Y.	Krane cars	11,170.00
South Bend Lathe Works, South Bend, Ind.	Lathes	18,302.31
Struthers Wells-Titusville Corp., Titusville, Pa.	Warping capstan	11,217.00
Swind Machinery Co., Philadelphia	Lathes	13,080.00
Tidewater Supply Co. Inc., Norfolk, Va.	Turret lathes	17,071.60
Warner & Swasey Co., Cleveland	Turret lathes	10,274.00
William Sellers & Co. Inc., Philadelphia	Boring machines and planers	\$225,053.00
Wilson-Brown Inc., New York	Honing machines	33,832.40
Woodward Governor Co., Rockford, Ill.	Governors	70,700.00
GRAND TOTAL		\$13,148,672.53

*Estimated.

■ A stainless steel plaque designating the Valley River Foot bridge, Murphy, N. C., as the most beautiful small bridge built during 1939 was unveiled last week. Award was by the American Institute of Steel Construction. Engineers were the Tennessee Valley authority, T. B. Parker, chief engineer; Harry A. Hageman, chief design engineer; F. W. Webster, head highway engineer; Edwin Harsch, senior structural engineer. Bridge was fabricated by Lloyd E. Jones Co., Chattanooga, Tenn.

Britain's Purchases Raise August Machine Tool Exports to New High

INDUSTRIAL machinery exports increased sharply in August to \$38,466,083, compared with \$31,093,954 in July. This was largely due to an increase of nearly 60 per cent in shipments of machine tools to England, according to the machinery division, department of commerce.

Other groups showing gains included construction and conveying equipment, with exports 20 per cent above the previous month; textile, sewing and shoe machinery, with a rise of 18 per cent; and "other industrial machinery" with shipments 8 per cent above July. Exports of power generating equipment and mining, well and pumping machinery showed declines of 4 and 13 per cent respectively.

August shipments of power-driven metalworking machinery increased to the record total of \$21,420,050, surpassing the previous high, \$21,281,332, established last April and showing a 44 per cent increase over July exports. Shipments of grinders, totaling \$4,504,421 in August, compared with \$2,316,361 in the previous month, showed greatest rise.

Exports of lathes were valued at \$3,807,855, against \$2,377,133 in July; milling machine shipments rose to \$2,864,179 from \$1,903,285. Exports of drilling machines valued at \$917,993 showed a modest gain over the July figure, \$844,539, and rolling mill equipment rose to \$1,175,648 from \$1,006,770 in the previous month. Shipments of metalworking machinery other than power-driven were valued at \$938,687 as against \$582,087 in July.

EXPORTS OF IRON, STEEL PRODUCTS AT ALL-TIME HIGH

Exports of iron and steel products, excluding scrap, set a new high record in August, totaling 1,045,947 tons. Great Britain was the leading purchaser. Aggregate exports of iron and steel products, scrap excluded, totaled 4,524,370 tons for the first eight months this year.

Pig iron exports in August totaled 121,948 tons, with eight months' total 323,674 tons. Exports of ingots and billets in the month totaled 342,641 tons; from January through August, 1,236,623 tons. Other August export totals: Shapes, 74,330 tons; unalloyed bars, 70,500 tons and black sheets, 51,234 tons.

August iron and steel scrap exports totaled 346,087 tons, with Japan taking 137,429 tons, Great Britain 136,604 tons and Canada 55,

111 tons. Aggregate iron and steel scrap exports through August this year were 2,142,176 tons.

IRON, STEEL IMPORTS IN AUGUST AT NEW LOW

Imports of iron and steel products, scrap excepted, reached a new low in August when trade totaled only 2089 gross tons compared with 3390 tons in July and 24,599 tons in August, 1939. The character of the August trade was such, however, that the value increased to \$516,187 from the July figure of \$351,826, but remained far short of the \$1,354,288 total of August, 1939.

Imports during the first eight months of 1940 totaled only 44,267 tons, valued at \$5,367,590, but 21 per cent by weight and 42 per cent by value of the 214,306-ton, \$12,665,984 trade of the comparable period of 1939.

Scrap imports in the 1940 January-August period amounted to 1428 tons valued at \$39,780 against a trade of 21,967 tons, valued at \$221,727 in the comparable 1939 period.

FARM TOOL EXPORTS

United States exports of farm equipment in August totaled \$6,985,937, a gain of 8 per cent over August, 1939, shipments of \$6,465,571, according to the machinery division, department of commerce. Increased shipments of harvesting machinery and tractors were counterbalanced by declines recorded for tillage implements and other farm equipment.

Tractors valued at \$4,479,921 were

exported in August, a 9 per cent increase over the corresponding 1939 period. Exports of harvesting machinery amounting to \$1,614,444 were 54 per cent above August, 1939, due to redoubled shipments of combines.

Shipments of tillage implements were 23 per cent below the August, 1939, level, \$364,083 compared with \$473,278. Almost all classes shared in the decline. Exports of other farm equipment totaled \$527,489, or 36 per cent less than the August, 1939, figure of \$829,874.

EXPORT PERMITS REQUIRED BY FRENCH GOVERNMENT

Exportation from France and Algeria of merchandise included under some 12,000 items of the French tariff has been made subject to export authorization from the foreign commerce office of the finance ministry, according to a cablegram from the American embassy at Vichy, France, to the department of commerce. Metal manufactures, automotive vehicles and industrial machinery are commodities affected by this regulation.

Application for export permits must give full data regarding proposed shipment including the amount of foreign exchange received in payment.

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Articles	(Gross Tons)		
	Aug. 1940	July 1940	Jan. through Aug. 1940
Fig iron	882	1,067	7,724
Sponge iron	1	..	610
Ferromanganese (1)	267	319	8,530
Spiegeleisen	25	662	9,188
Ferrochrome (2)	..	..	1
Ferrosilicon (3)	105	103	871
Other ferroalloys (4)	..	25	215
Steel ingots, blooms, etc.	..	..	3
Billets, solid or hollow	..	..	437
Concrete reinf. bars	..	..	8
Hollow bar, drill steel	10	27	854
Bars, solid or hollow	43	26	1,787
Iron slabs	..	..	..
Bar iron	..	..	194
Wire rods	5	18	3,949
Boiler and other plate (including skelp)	1	2	10
Sheets, skelp, saw plate	11	13	113
Die blocks, blanks, etc.	..	..	12
Tin plate, taggers' tin andterneplate	6	15	78
Structural shapes	19	4	710
Sashes and frames	..	..	16
Sheet piling	..	..	..
Rails, track material	28	531	1,444
Cast-iron pipe, fittings	..	..	419
Mall iron pipe fittings	..	..	2
Welded pipe	..	31	31
Other pipe	190	151	2,349
Cotton ties	..	11	13
Other hoops and bands	..	..	599
Barbed wire	..	42	86
Round iron, steel wire	43	20	849
Teleg., telephone wire	..	..	..
Flat wire, steel strips	396	256	2,008
Wire rope and strand	19	41	486
Other wire	..	..	1
Nails, tacks, staples	2	1	106
Bolts, nuts, and rivets	1	3	123
Horse and mule shoes	..	..	3
Castings and forgings	35	22	433
Total	2,089	3,390	44,267
Iron and steel scrap	16	152	1,428
GRAND TOTAL	2,105	3,542	45,695

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

ORIGIN OF AUGUST IMPORTS

	Gross Tons			
	Iron ore	Pig iron	Manganese ore	Ferromanganese
United Kingdom	15	..	..	..
Brazil	11,500	..	7,520	..
Canada	21,604	220	..	..
Mexico	435	..	45	..
Cuba	5,800	..	3,975	..
Chile	154,400	..	224	..
Iran	100	..	..	..
British India	..	662	13,671	..
Philippine Is.	..	..	5,983	..
Netherlands Indies	..	..	288	..
Soviet Russia	..	..	40,356	..
South Africa	..	..	13,699	..
Gold Coast	..	..	21,349	..
Norway	..	..	..	267
Total	193,854	882	107,110	267
	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
United Kingdom	10	..	..	..
Canada	1	19	..	..
Sweden	..	..	10	..
Total	11	19	10	..

Pullman-Standard To Build Tanks for Britain

■ Pullman-Standard Car Mfg. Co., Chicago, will build a "substantial" number of medium weight tanks for Great Britain. They will resemble those of the American army and will weigh between 25 and 30 tons each.

Pullman-Standard also will build 230,680 mortars for the army. Both tanks and mortars will be manufactured at company's Hammond, Ind., plant and several months will be required for retooling before production starts.

August Electric Truck Bookings Total \$492,616

■ Second largest booking of electric industrial trucks and tractors in 1940 was made in August, according to Industrial Truck Statistical association, Chicago. One hundred twenty-two units were booked, compared with 151 in July, the year's high.

Net value of the bookings, for chasses only, was \$492,616, compared with \$591,784 in July. Three non-elevating platform trucks, 100 cantilever trucks, eight tractors, six crane trucks and five special trucks were booked during the month.

Canadian Steel Output Near All-time High

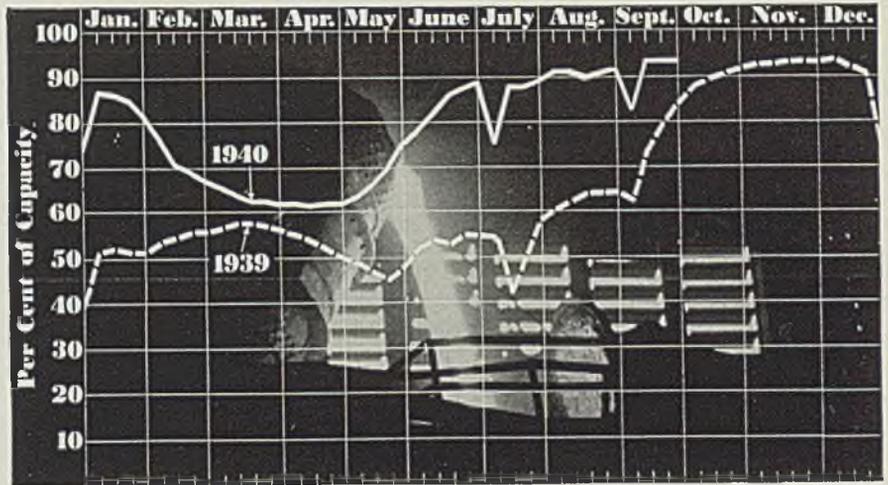
■ Canadian steel production in August was 172,210 gross tons, only 2207 tons below the all-time high made in May. Steel production for eight months was a new high at 1,300,033 tons, exceeding the eight months' total of 1,147,793 tons in 1918, the World war peak.

Pig iron production in August was about 7 per cent under that of July but 35 per cent greater than in August, 1939. In gross tons:

	Steel ingots	Pig iron	Ferro-alloys
August, 1940..	172,210	88,885	9,697
July, 1940.....	169,577	95,924	9,257
August, 1939..	122,019	65,920	3,313
8 mos., 1940...	1,300,033	734,436	77,198
8 mos., 1939..	813,309	422,028	40,692

Industrial Advertisers Elect Dodds President

■ Richard P. Dodds, Truscon Steel Co., Youngstown, O., has been elected president, National Industrial Advertisers association. Vice presidents elected: E. J. Goes, Koehring Co., Milwaukee; H. V. Merceready, Magnus Chemical Co., Garwood, N. J.; Terry Mitchell, Frick Co., Waynesboro, Pa.; W. D. Murphy, Sloan Valve Co., Chicago; L. J. Ott, Ohio Brass Co., Mansfield, O.; R. T. Reinhardt, California Corrugated Culvert Co., Berkeley, Calif. E. C. Howell, Carboly Co. Inc., Detroit, was elected secretary.



PRODUCTION... Steady

■ STEELWORKS operations last week continued at 93 per cent, the third consecutive week, advances in four districts being balanced by losses in two, with six unchanged. In the same week of 1939 the rate was 84 per cent; in 1938, 47 per cent.

Birmingham, Ala.—Unchanged at 97 per cent, with 23 open hearths in production.

Detroit—Increased 3 points to 94 per cent. One producer operated 15 furnaces the full week and a sixteenth four days and the other nine of its ten open hearths.

St. Louis—Stationary at 80 per cent for the fifth consecutive week. One mill will add an open hearth this week.

Cincinnati—Rose 9 points to 88 per cent, one interest having all its open hearths in production. The same schedule is expected this week.

Chicago—Drop of 2½ points to 96 per cent resulted from necessity for furnace repairs by two interests. One steelmaker increased output but not sufficiently to make up the loss. Interlake Iron Corp. has relighted a stack blown out in June for repairs.

Cleveland—Off 2 points to 86 per cent as some furnaces were withdrawn temporarily for repairs.

Pittsburgh—Steady at 88½ per cent.

Wheeling—Holds at 97 per cent with most producers at capacity.

New England—Gain of 5 points to 85 per cent. One furnace goes down this week for repairs but another interest adds two, going to 100 per cent of its capacity.

Buffalo—Continues at 90½ per cent, necessity for furnace repair preventing further expansion.

Central eastern seaboard—Maintained a rate of 92 per cent with small increase expected this week.

Youngstown, O.—Production increased 1 point to 84 per cent, with 63 open hearths and three bessemer's operating. Bessemer output is at about 80 per cent. An increase is expected this week.

Follansbee Plans To Produce Steel Forgings

■ Follansbee Steel Corp., Pittsburgh, last week reported it is adapting excess capacity of its Toronto, O., plant for production of carbon and alloy steel forgings.

"Recent changes in the company's production facilities make available at our Toronto plant excess open hearth capacity of 100,000 tons annually and forging equipment sufficient to handle this ingot tonnage," said John Follansbee, chairman. "This move is prompted by special demand for this type of material associated with national defense requirements."

■ Railroad locomotives delivered by manufacturers in July totaled 30, compared with 39 in June and 23 in July, 1939, according to the bureau of the census.

District Steel Rates

	Percentage of Ingot Capacity Engaged		In Leading Districts	
	Week ended Sept. 28	Change	1939	1938
Pittsburgh	88.5	None	79	37
Chicago	96	- 2.5	84	41.5
Eastern Pa.	92	None	61	32
Youngstown	84	+ 1	86	49
Wheeling	97	None	88	54
Cleveland	86	- 2	87.5	48.5
Buffalo	90.5	None	72	51
Birmingham	97	None	86	57
New England	85	+ 5	100	65
Cincinnati	88	+ 9	78.5	43
St. Louis	80	None	72	48.5
Detroit	94	+ 3	99	72
Average	93	None	84	47

Ryerson Says Defense Program Takes 12.8% of Steel Output

■ STEEL requirements for the country's defense program probably will not exceed 6,000,000 to 7,000,000 tons in the peak year of its development, and a fair estimate at this time is that 5,000,000 tons of finished steel will be ample to meet the needs of 1942.

This was the message of E. L. Ryerson Jr., chairman, Inland Steel Co., Chicago, who spoke at the banquet which closed the thirty-sixth annual convention of the Association of Iron and Steel Engineers, Hotel Stevens, Chicago, Sept. 24-27.

When we relate this to our estimated annual capacity of about 57,000,000 tons of finished steel products, or to our 1939 production of about 39,000,000 tons, the 1942 requirements will amount only to about 12.8 per cent, he stated. If we add the 6,000,000 tons now being shipped to Great Britain to our own requirements, the two combined indicate that about 19.3 per cent of our total steel capacity is for war materials.

Mr. Ryerson expressed the opinion that regardless of what the outlook in Europe may be, we must continue to think in terms of the world as a market for our products. If this is done, he stated, there never can be any question as to our ability to expand with still greater productive capacities.

The association has allotted \$1000 to each of 10 sections throughout this country for educational courses. In Cleveland where a group of 62 meet weekly at Case School of Applied Science, 57 have completed the first year's project. Numerous students from Canton-Massillon district traveled approximately 5000 miles before completing the work. The Chicago section started with 85 men studying the fundamental principles of steel production each Tuesday evening at the Armour institute, Chicago. The Philadelphia section has authorized the expenditure of \$1000 on research work, holding the education plan in abeyance. The Birmingham section has established two scholarships.

Since last year's meeting the A.I.S.E. has increased its membership by 216. The committee, which is formulating new specifications for overhead cranes at a cost of about \$10,000, reported that its work should be completed next year.

Considerable interest was manifested in maintenance of steel plant equipment. T. R. Moxley, general master mechanic, Wheeling Steel Corp., Steubenville, O., stressed the value of the heat treating depart-

ment, pointing out that it is becoming more and more important to the forge shop in servicing milling cutters and other machine shop tools. The speaker emphasized the need of training apprentices in fundamentals of mechanical trades, pointing out that such a program has been neglected during the last decade.

John S. Thomas of the South Works, Carnegie-Illinois Steel Corp. S. Chicago, Ill., mentioned that during the past two years considerable shop equipment has been replaced with modern units to improve quality of workmanship. During the past four years the number of tools reduced at one plant through the introduction of modern units amounted to 15 to 20 per cent. Not only was more room afforded by the installation of modern equipment but there was greater freedom in handling material. Many plants, he stated, are considering the installation of modern maintenance equipment in various shops serving steel plants because of present high labor costs and low quality work turned out.

The subject of apprentices was discussed by Richard Wearne of the Gary Works, Carnegie-Illinois Steel Corp., Gary, Ind. He questioned whether a company was entitled to take four years of an apprentice's time without compensation.

The modern trend, he stated, is to develop specialists. We take 100 boys and start them through school but it requires another eight years before they are worth anything. We don't require a journey machinist for every job in the maintenance department. Why don't we take a boy after two or three years training and put him to work as a gear cutter? He would then be making money for himself as well as for the company. At the end of 10 years, he said, 10 per cent of the boys are experts and only about 10 per cent become supervisors. Is it fair to the boys if we use only a portion of the knowledge they gained during their apprentice course, he inquired.

By the close of 1940 there will be at least 1000 diesel locomotives engaged in shifting work, and of this number about 150 will be in steel plants. This was stated by E. M. Smith, assistant sales manager, Electromotive Corp., La Grange, Ill. In the last four years the policy of railroads has been to replace steam equipment with diesel powered units. He mentioned that a tank of fuel oil gives the same service as 12 tons of hard coal for steam generation. Also that main line diesel locomotives during the past four years traveled 1,400,000 miles at a speed of 67 miles per hour—this being equivalent to 30 years work of a switching locomotive.

He cited one steel plant that has effected a 30 per cent reduction in the total switching hours by using diesels. One tank of diesel oil will cover as many switching hours as 15 tanks of oil in a fuel locomotive.

Group at A.I.S.E. Meeting in Chicago



■ Left to right: T. B. McElroy, superintendent of light and power, Youngstown Sheet & Tube Co., Youngstown, O.; A. J. Fisher, fuel engineer, Bethlehem Steel Co., Sparrows Point, Md.; L. O. Morrow, sec-

retary, Philadelphia section, A. I. S. E.; L. J. Gould, assistant chief engineer of construction, Bethlehem Steel Co., Bethlehem, Pa.; Louis Moses, superintendent, rail mill and roll department, Sparrows Point.

Another speaker pointed out that a diesel locomotive costs \$60 per ton, that it "rode the curves better and was easier on the tracks."

Buttwelded joints were recommended for blast furnace stoves by H. C. Boardman, Chicago Bridge & Iron Co., Chicago Heights, Ill., whose company recently completed two welded stove shells at a furnace of the Ohio Works, Carnegie-Illinois Steel Co., Youngstown, O.

One of the questions raised during the discussion at the welding section was: "Is it practical to weld cast iron?" The answer given was "No."

Electric welding of open-hearth charging machine rams direct to the peels has been found satisfactory, as it eliminates the keys and the necessity for tightening them, according to C. C. Keyser, welding supervisor, Bethlehem Steel Co., Steelton, Pa. He pointed out that if open-hearth department employed one welder for every three furnaces in operation it would be in a position to reduce its welding costs.

Bottom and Top Plates Welded

Further discussion also brought out that both the bottom plates and the top steel work of open-hearth furnaces now are being assembled by welding.

In the opinion of H. F. Walther, assistant melting superintendent, steel and tube division, Timken Roller Bearing Co., Canton, O., large electric melting furnaces are more economical to operate than smaller furnaces. He cited that rammed bottoms are just as suitable as burned-in bottoms and recommended silica brick, properly laid, for large electric units.

He mentioned that silica brick for roof construction will give some indication when it is about to fail and, therefore, is better than any other brick for roofs. He warned that roof insulation on electric furnaces is not practical. Quality steel can be made in large electric furnaces, contrary to general opinion. They are more easily controlled because the chemical reactions occur more slowly.

In discussing composition bearings, H. R. Gilchrist, lubrication engineer, Carnegie-Illinois Steel Corp., Youngstown, O., said that by cutting sections about 2 inches wide from discarded composition bearings and using these on the outside shoulder of new bearings, the life of the latter is prolonged from three to four times. He emphasized that by the use of an emulsion for lubrication containing 90 per cent water, composition bearings will last indefinitely.

Steel resurfaced by the scarfing torch increases in temperature from

New Officers of A.I.S.E.

(To take office Jan. 1, 1941.)

President

W. A. Perry, superintendent of electrical and power depts., Inland Steel Co., Indiana Harbor, Ind.

First Vice President

T. E. Hughes, superintendent of maintenance, Carnegie-Illinois Steel Corp., Duquesne, Pa.

Second Vice President

F. E. Flynn, district manager, Republic Steel Corp., Warren, O.

Treasurer

C. L. McGranahan, assistant general superintendent, Jones & Laughlin Steel Corp., Pittsburgh.

Secretary

J. L. Miller, assistant chief combustion engineer, Republic Steel Corp., Cleveland.

Past Presidents

J. A. Clauss, chief engineer, Great Lakes Steel Corp., Ecorse, Mich.

C. C. Wales, vice president, Hamilton Bridge Co., Hamilton, Ont., Canada.

Directors

G. C. Pfeffer, superintendent of maintenance, Florence Pipe & Foundry Co., Florence, New Jersey.

W. J. Wilson, electrical superintendent, American Cast Iron Pipe Co., Birmingham, Ala.

I. N. Tull, electrical superintendent, Republic Steel Corp., Cleveland.

S. M. Jenks, assistant general superintendent, Carnegie-Illinois Steel Corp., Gary, Ind.

A. R. Dibben, assistant electrical superintendent, Youngstown Sheet & Tube Co., E. Chicago, Ind.

R. S. Shoemaker, lubrication engineer, American Rolling Mill Co., Middletown, O.

C. H. Williams, assistant chief engineer, Carnegie-Illinois Steel Corp., Youngstown, O.

L. J. Gould, assistant chief engineer, Bethlehem Steel Co., Bethlehem, Pa.

A. C. Cummins, general superintendent, Carnegie-Illinois Steel Corp., Youngstown, O.

W. H. Burr, electrical superintendent, Lukens Steel Co., Coatesville, Pa.

P. F. Kinyoun, combustion engineer, Bethlehem Steel Co., Lackawanna, N. Y.

F. H. Dyke, superintendent, blooming, bar and strip mills, Wheeling Steel Corp., Steubenville, O.

James Farrington, electrical superintendent, Wheeling Steel Corp., Steubenville, O.

100 to 200 degrees Fahr., according to E. A. Doyle, consulting engineer, Linde Air Products Co., New York. He stated that 1½ to 2½ cubic feet of oxygen per pound of steel is a good factor of consumption. Hot scarfing of steel saves 40 per cent oxygen and from 50 to 75 per cent acetylene over the method of resurfacing cold steel.

Discussion brought out that hot scarfing high-silicon steel presents some difficulty mainly because of slag removal. At one plant in the Chicago district 901,000 tons of slabs was resurfaced using 23,000,000 cubic feet of oxygen; production per man increased 5:1 over chipping methods. By installing a pedestal machine for resurfacing slabs intended for tin plate, 0.050-inch was removed from each edge at the rate of 125 feet per minute

using 28 pounds oxygen and 12 pounds of acetylene. Slabs requiring spot scarfing after machine treatment amounted to about 6 per cent. It was stated that resurfacing by machine reduces cost from 60 to 70 per cent over hand methods.

Two Thousand Attend Foremen's Convention

■ Two thousand members of the National Association of Foremen registered for the annual convention in Cincinnati last week.

"Formation and Operation of a Foremen's Club," was the subject of an address by F. J. Schaeffer, executive director of the association, and an employe of Republic Steel Corp.

"Heretofore the standard of merit for a foreman was his ability to push plant production," he said. "In the last few years, almost every industrial concern has come around to the belief that the foremen's job is primarily a matter of establishing better employe-employer relationship. They want men with leadership, not men with big fists."

Draft, 40-Hour Week May Increase Costs

■ Steel and metalworking company executives are giving attention to the probability of increased costs due to additional overtime wages made necessary by two factors: (1) The mandatory 40-hour week which becomes effective under the federal wages and hour law at midnight Oct. 23; (2) conscription of workers which may accentuate the present skilled labor shortage.

Many steel producing and metalworking companies already are operating on a standard 40-week and are paying time and one half for overtime. They, of course, will not be affected by the reduction of the work week from 42 to 40 hours under the wages and hours law. Wage provisions of the law do not change this year, remain at the 30 cents an hour minimum for industry generally.

To what extent military training will drain the metals industries of their workers remains to be seen. The conscription bill provides that "no deferment shall be made of individuals by occupational groups." The act, however, provides for the deferment of those "whose activity in other endeavors is . . . necessary to the maintenance of the national health, safety, or interest." Many executives believe workers in the metals industries who possess any considerable degree of skill will be deferred in the interests of national defense.

Windows of WASHINGTON



By L. M. LAMM

Washington Editor, STEEL

Devise Labor-Training Program for Defense Industries.

Calls for Employee's "Fullest Use of Highest Skill."

Senate Resolution Asks "Defense Leaks" Be Probed.

Survey Traces Machine Tool Industry's Development.

WASHINGTON

■ PROGRAM to enable every American worker in defense industries to make the "fullest use of his highest skill" was agreed on unanimously last week at a conference held by the training-within-industry advisory committee recently established by Sidney Hillman, head of the labor division of the defense commission.

This new approach, as approved by the advisory committee, is known as the up-grading plan, and is expected to fulfill skilled labor requirements for the expanding defense program as they arise. The new policy will be carried out in accord with the labor division's emphasis upon "employing the unemployed" as the primary step in meeting defense labor needs.

Offers Greater Opportunities

The plan grew out of many discussions among representatives of industries and labor unions, under the auspices of C. R. Dooley, director of the defense commission's training-within-industry department, and his assistant director, J. W. Dietz. Mr. Dooley was loaned to Commissioner Hillman by Socony Vacuum Co., and Mr. Dietz was borrowed from Western Electric Corp.

Sponsors of the plan assert that it will probably make employe advancement more rapid than ever before. They point out that the top notch mechanic who often devotes 25 per cent of his time to

the most skilled part of his work, and 75 per cent to its less precise and exacting phases, will benefit by being able to give his attention exclusively to the more skilled requirements. Likewise the new employe will be taught not only a single basic operation but also its relationship to others in the total process, and will thus prepare himself to "move up rung by rung on the ladder of promotion and progress," according to Mr. Dooley.

The worker in the intermediate grades, under the guidance and stimulus of this "training for the best you can do" technique, can be transferred upward from light machine operation to more complicated tasks. Similarly, apprentices who comprise a small, carefully selected group, will acquire all-around skills qualifying them for assignments demanding more versatility. This, in turn, becomes a "feeder" source for further "training-up."

The decision to apply this "up-grading plan" widely throughout defense industries was made only after close study of methods used by leading optical, toolmaking and other establishments had convinced observers from the training-within-industry advisory committee that these techniques could be readily adapted to meet the training needs of the defense program.

To quicken the adoption of the plan on a nation-wide basis, about 20 district representatives who will be assisted by four advisers, two

from management and two from labor, together with a panel of personnel experts, and training specialists, are now being appointed to supervise this undertaking in some twenty industrial centers. Each district representative and his aides will co-operate with industry and labor on a 4-point program:

1. To assist management to analyze training needs both for workers and supervisors.
2. To help create training procedures "custom built" to each individual plant's requirements.
3. To foster and make promptly available to management all information relating to upgrading plans.
4. To aid management to utilize to the fullest extent such government agencies as public employment offices, various engineering colleges and vocational schools.

Jesse Jones, federal loan administrator, last week announced that from June 25 through Sept. 18 the RFC has authorized 112 loans and commitments totaling \$558,959,990 to aid in the national defense program. Banks participated in 21 of these loans to the extent of \$531,491.

In line with the RFC's usual practice of encouraging bank participation in business loans, the RFC hopes that banks throughout the country will co-operate with it and with industry in making defense loans, and will be glad to have them take all or any part of any such loans.

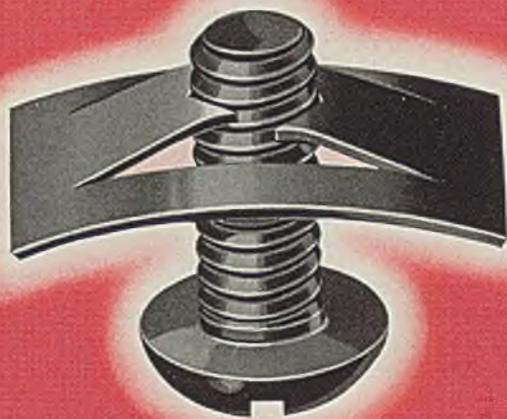
SENATE COMMITTEE WANTS TO PROBE "DEFENSE LEAKS"

Senate committee on interstate commerce favorably reported a resolution authorizing a senate investigation of possible leaks in defense secrets through German and other foreign connection in American industry.

Senator Wheeler, committee chair-

Speed Nuts

THE ONLY ONE PIECE FASTENING DEVICES THAT AFFORD A DOUBLE LOCK



INWARD THREAD LOCK



ELIMINATE THREADED NUTS AND LOCK WASHERS

The SPEED NUT is the only one piece fastening device ever developed that actually affords a double lock. Note how the arched prongs fit into the threads while the main base of the SPEED NUT is also well arched. As the bolt is turned and tightened, the main arch of the SPEED NUT is brought down and the prongs are forced deeper into the roots of the threads to double-locked position. This gives an arched spring lock and an inward thread lock at the same time.

Vibration tests have shown that the SPEED NUT will stand from 3 to 6 times more vibration than conventional nuts, without loosening. That is why we say, SPEED NUTS definitely prevent loosening from vibration and hold assembled parts together under firm spring tension for the life of the product.

Are you taking full advantage of SPEED NUTS as time and cost savers in the assembly of your *entire* product? Check every assembly location and switch to standard SPEED NUTS wherever possible. Write for samples today, explaining nature of assembly.

SEE US AT BOOTH A-3 NATIONAL METAL SHOW OCTOBER 21 TO 25

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IN CANADA: Wallace Barnes Co., Ltd., Hamilton, Ontario. IN ENGLAND: Simmonds Aerocessories, Ltd., London. IN FRANCE: Aerocessoires Simmonds, S. A., Paris.

OVER 500 MILLION ALREADY USED—OVER 700 SHAPES AND SIZES

man, explained he intends to cooperate fully with the department of justice if the resolution receives final approval. He said a subcommittee probably would be appointed to make the inquiry.

German companies reportedly have contracts with American manufacturers which require periodic reports of plant production, Mr. Wheeler said. If this is true, he added, Germany has an excellent source of information concerning the production of American military equipment.

The resolution's preamble specifically mentioned "an American corporation which supplies glass for instruments and weapons for the army and navy," and asserted that this company has "close relations with a German concern involving a disclosure of secret processes."

It also asserted that a metal "invaluable in the manufacture of airplanes" is controlled by a corporation, half of whose stock is "reliably reported" to be owned by the German chemical trust, and that some large concerns, important to national defense, "reputedly have deferred national interests to monetary consideration by giving preference to foreign munitions orders."

The committee, Mr. Wheeler said, would inquire into pooling arrangements, stock ownership and international connections of American companies which could bear on national defense. Remedial legislation may be recommended, if the inquiry indicates a need for it.

TRACES DEVELOPMENT OF MACHINE TOOL INDUSTRY

Growth and development of the machine tool industry in the United States is described in a study by David Longanecker, a machinery specialist in the bureau of foreign and domestic commerce.

From its depression low the industry was aided in recovery by greatly increased foreign sales in 1934 and 1935, especially to Great Britain, Russia, France, Canada and Japan. Last year the outbreak of war in Europe placed tremendous pressure on machine tool production, the study records.

"The industry expanded operations rapidly in an effort to keep up with demands. From 140 and 160 in August, 1939, the indexes of employment and payrolls in the industry jumped to 156 and 182 in September, and in successive advances reached 193 and 257 in December, representing the highest levels attained since the World war.

"Machine tool builders entered 1940 with a large backlog of both domestic and foreign orders. This backlog has increased despite continued expansion of the industry augmented by a greater use of the prac-

tice of 'farming out', or subcontracting, for parts of assemblies.

"Developments in the European war and initiation of our own defense program have added greatly to the already heavy demands on the industry. In July of this year the machine tool industry employment and payroll indexes stood at 235 and 308, respectively, gains of 42 and 52 points over the December, 1939, figures. Later figures are not available, but it is believed that the current annual rate of machine tool production is near the peak attained during the World war.

"Exports have been at even higher levels so far this year, but reached the maximum monthly value of \$17,910,000 in April. They have declined steadily since then, owing mainly to the discontinuance of purchases by France. Since then, also, the government has established control over the export of machine tools, as well as a priority system through which production is allocated according to the requirements of the defense program. From January through July of this year, however, machine tools valued at \$99,670,000 were exported from the United States, more than were exported during the entire 12 months of 1939. Exports to Great Britain through July of this year totaled \$38,469,000, to France \$28,367,000, to Japan \$12,052,000, to Russia \$10,015,000, and to Canada \$3,708,000."

While foreign orders increased, Mr. Longanecker points out, machine tool obsolescence continued practically unabated in United States industries.

Most pressing problem of the industry, he says, is the supply of skilled machinists. However, federal and local governments, as well as the industry itself, now are actively engaged in promoting training programs.

TOOL ACCESSORY OUTPUT IN 1939 LOWER THAN 1937

Manufacturers of machine tool and other metalworking accessories reported decreases in employment, wages and production for 1939 as compared with 1937, according to figures compiled by the bureau of census.

The industry for census purposes covers those establishments whose chief products are: (1) attachments and accessories for machine tools and metalworking machinery, such as forming and stamping dies, jigs, fixtures and special tools; (2) milling cutters, taps and dies, twist drills and reamers; and (3) precision measuring tools, such as micrometers, verniers, gages.

Wage earners primarily engaged in manufacturing numbered 25,161 in 1939, a decrease of 23.5 per cent from 1937's total, 32,893. Wages, \$41,346,-

606 last year, were 26.1 per cent less than the 1937 figure, \$55,956,935.

Value of the industry's products in 1939 was \$125,630,124, compared with \$162,002,009 in 1937, a decrease of 21.2 per cent.

JONES OUTLINES AIMS FOR DEPARTMENT OF COMMERCE

Jesse H. Jones, secretary of commerce, told trade paper editors at a meeting here last week he will try to make the department represent business and industry in the same manner in which the department of agriculture represents farmers and the department of labor represents employees.

Mr. Jones also told the editors he is enthusiastic about the department's business advisory council, and he hopes to extend the work of the council.

Mr. Jones, who succeeded Harry Hopkins, talked to the editors both as secretary of commerce and as federal loan administrator. Government, he said, should not be in business, but it is and it is being found that government can function in business.

The new secretary said there is nothing unsound about the Reconstruction Finance Corp., of which he has been the head for some years. Loss of loans by the RFC to business and industry has been only 10 or 15 per cent. Mr. Jones opined business is the backbone of the country, and while the government has to act as a policeman in many instances, it should not disturb business. With reference to taxes, Mr. Jones said business can stand what it has to stand.

About 300 loans have been made by RFC for defense purposes, totaling more than half a billion dollars.

CONTRACT FOR EXPLOSIVES PLANT IN ILLINOIS AWARDED

War department has announced the award of contracts for the construction and operation of a plant at Wilmington, Ill., to produce TNT and DNT. Stone & Webster Engineering Co., New York, will construct the plant on a cost-plus-fixed fee basis, estimated at \$10,863,000. The work is expected to be completed within ten months.

E. I. du Pont de Nemours Co. will operate the plant for the government on a cost-plus-fixed fee basis. A production award of approximately \$6,700,000 has been given the Du Pont Co.

War department also has announced a contract with Sanderson & Porter, New York, for construction and operation of an ammunition loading plant near Wilmington. Government will retain title to the plant, which is estimated to cost \$14,000,000.

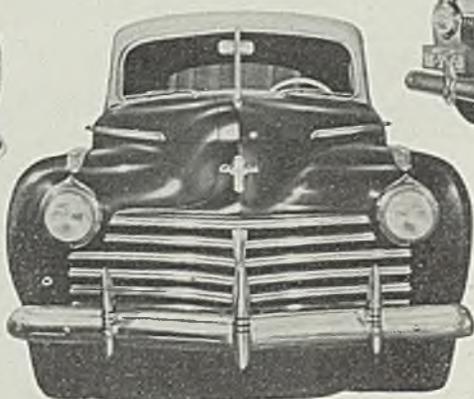
Among the New Models



DODGE



DE SOTO



CHRYSLER



NASH



PLYMOUTH



HUDSON



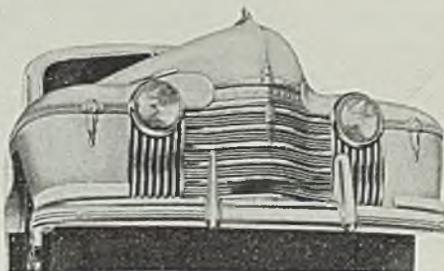
STUDEBAKER



LINCOLN-ZEPHYR



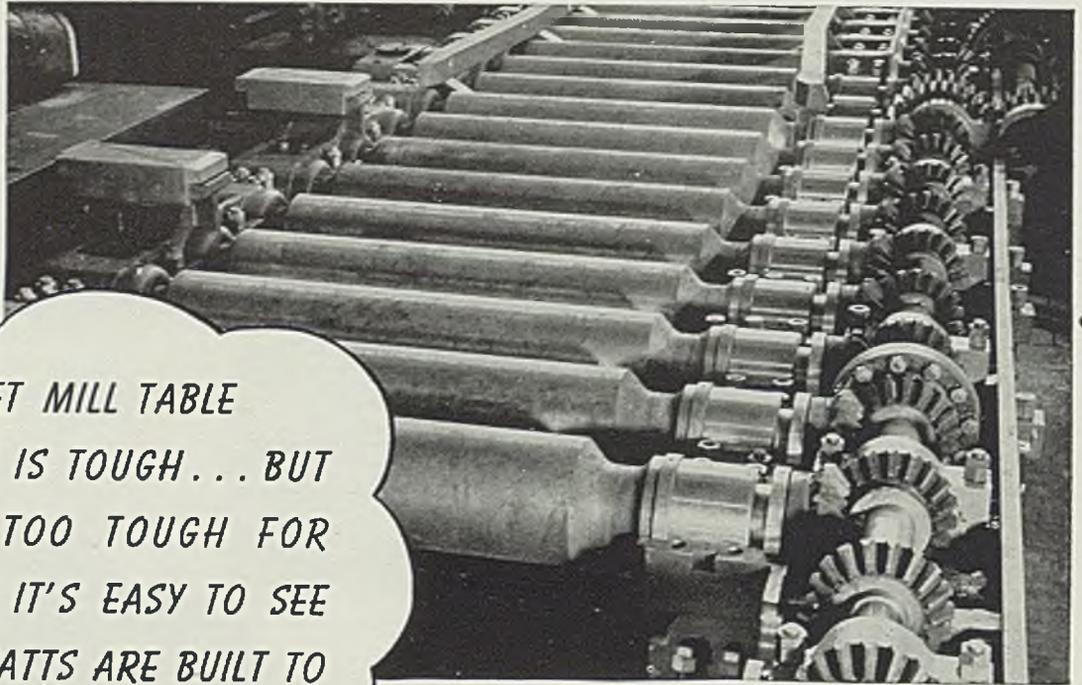
BUICK



OLDSMOBILE

■ WITH the New York automobile show just two weeks away, a preview of a representative sampling of 1941 models is timely. Here in various poses are ten of them, resplendent in two-tone body finishes, brilliant chrome plate and stainless steel, striking examples of what designers

think the driving public wants for the year just ahead. They are testimony to the fact that no interruption to new model development has been occasioned by the national defense program. A salute to the automobile industry, No. 1 customer for steel and a hundred allied metals and materials!

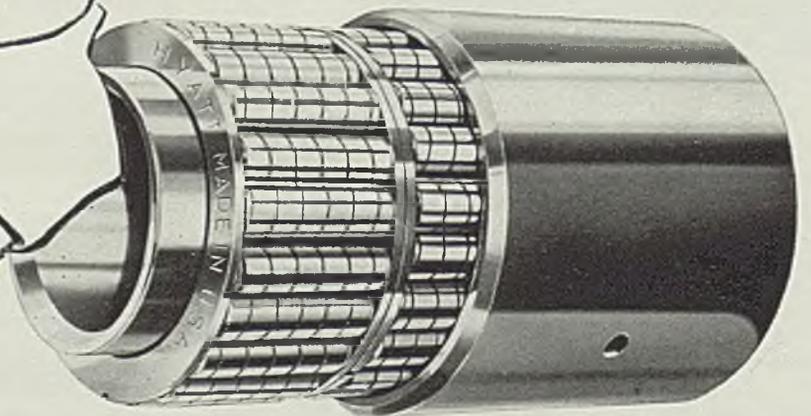


"YOU BET MILL TABLE SERVICE IS TOUGH... BUT NEVER TOO TOUGH FOR HYATTS. IT'S EASY TO SEE THAT HYATTS ARE BUILT TO STAND THIS HEAVY WORK!"

CONTINENTAL ROLL & STEEL FOUNDRY COMPANY are the builders of this 44" blooming mill table, in which some of the Hyatt Roller Bearings are shown exposed. Here, as in cranes, motors and ingot cars, sturdy Hyatts remain unaffected by heavy loads and scorching heat... avoid friction and replacement costs... prolong machine life.

To assure youthful performance in the machines you buy, be sure to specify Hyatt Roller Bearings! Hyatt Bearings Division, General Motors Sales Corporation, Harrison, New Jersey; Chicago, Detroit, Pittsburgh and San Francisco.

KEEP THEM YOUNG
WITH HYATTS!



HYATT ROLLER BEARINGS

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Packard Starts Construction of Aircraft Engine Plant.

Requirements for Armament Tooling "Astronomical."

Lower Priced Cadillac Replaces GM's LaSalle Series.

Kelsey-Hayes To Manufacture Browning Machine Guns.

Industry's Statistical Report Issued.

DETROIT

■ WORKMEN have begun ripping down an old wood garage building along Harper avenue here on property of the Packard Motor Car Co., preparatory to clearing ground for construction of a new plant building to house manufacturing of Rolls-Royce aircraft engines, Contract for this work, as indicated in this department recently, was signed some weeks ago, the effective date being Sept. 20. Initial contract calls for 6000 engines to be supplied to Britain and 3000 to this country; options on thousands more have been given.

For two months now, under direction of J. H. Marks, purchasing manager, Packard has been proceeding quietly lining up necessary sources of supply for materials and parts. It has been an exceedingly difficult job, for many suppliers are loaded to the gunwales with work for domestic aircraft engine builders and are unable to accept further orders. Hence, Packard has sought to ferret out new sources and persuade them to undertake expansions in order to handle the tremendous volume of work incident to the Rolls-Royce project.

Last week Mr. Marks was appointed vice president in charge of procurement, machinery and accessories in connection with the Rolls-Royce plant, and will supervise construction of the plant as well. Marks is well qualified for this job, for after joining Packard in 1916 he was placed in charge of factory construction and rearrangement in connection with the manufacture of Liberty motors. He has been in

charge of Packard purchases since 1925.

A staff of some 120 men has been busy for several weeks ironing out engineering details of the Rolls-Royce engine to facilitate mass production. Vast amount of labor has been involved in this, too, for many of the British concepts of design are not readily adaptable to American methods, and at the same time too much departure from the original Rolls-Royce design is not permissible since the unit must continue to be a Rolls-Royce and not a Packard engine.

Encounter Skilled Labor Shortage

Another headache for Packard officials is the labor problem. Ten months hence, 14,000 men must be located, employed and trained to handle production machinery. Where they are going to be found is the question, difficulties already being encountered in lining up draftsmen and other engineering department personnel.

Meanwhile, Packard's marine engine division is turning out one 12-cylinder 1250-horsepower engine a day for installation in torpedo boats for both Britain and the United States. These engines are built in Packard's aircraft division where over 300 men are employed on a two-shift basis. Deliveries last week had reached a total of 58. Orders for these engines have been placed as follows: Initial lot of

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seven experimental engines; three for Higgins Boat Co.; 81 for Electric Boat Co.; 72 for Canada; 100 for England; more recently England has ordered 100 more and Canada 30, while the United States government has contracted for another 87. This makes a total of 480 or a backlog of 18 months production on the present basis. However, a third shift may be added shortly and production stepped up appreciably.

Two other large plants located in this area for armament projects—the Chrysler tank arsenal and the Ford plant for manufacture of Pratt & Whitney double-row Wasps—are officially under way, ground having been broken, and 7500 tons of structurals awarded for the Chrysler plant. The Ford plant will require 6500 tons of piling and 8500 tons of structurals, bids being taken last week.

Although it is a comparatively simple matter to erect these plants, large as they are, the problem of obtaining the necessary machine tools is a critical one. Inquiries already are out on machines for all three plants, but deliveries tentatively are being placed at February and March of next year. Only a few of the necessary machines can be delivered by this time, however, the plan being to supply what are termed "working outfits"—skeletonized groups of machines which will permit production to be started in a limited way. Later, other machines can be shipped and the plants gradually brought to capacity.

Representatives of machine tool companies here, studying the lists of equipment required for these new plants, often rub their eyes to see if they are dreaming, so astronomical are some of the quantities required and amounts of money to be spent.

With full-scale production still many months away, no pressure is developing on materials, such as steel. Next year, at this time, may see the same scrambling to get

steel as is now evident on machine tools. Steel sales in this area are brisk, nonetheless, with no general tendency observed toward any building up of inventories. Motor companies are making normal releases leisurely and are keeping a watchful eye on retail sales of new models which so far have been good. But car builders are playing it cautiously, planning ahead only from month to month. Public reaction to the New York auto show, opening in two weeks, will be studied carefully as a gage to fall and winter business.

Buick officials apparently are already convinced October will be a good month, for suppliers have been informed production plans call for output of 35,969 units from three assembly plants in 23 working days, an all-time high for this producer and even exceeding the daily rate of 1500 which was set earlier as peak capacity. It is expected that minor assembly difficulties which have been encountered in recent weeks can be scaled to permit full speed on assembly lines. One day recently there were 4000 cars lined up at the Buick plant, each requiring some minor part before it could be released for shipment.

Buick Lists "Price of Success"

Buick has prepared some interesting figures on expenditures for tools and equipment over the past eight years, which it calls the "price of success":

Year	Model year tool bill	Machinery and equipment
1934.....	\$1,826,394	\$1,680,254
1935.....	678,994	3,156,635
1936.....	3,622,104	3,432,296
1937.....	4,453,107	7,843,208
1938.....	4,588,246	1,542,855
1939.....	4,939,699	1,088,319
1940.....	5,999,970	2,878,943
1941.....	5,750,806	5,250,000*

*Estimated.

Adding to these totals the amounts spent for buildings and land improvement in eight years, a grand total of close to \$64,000,000 has been spent by this division for production of an estimated 1,600,000 cars, figuring 1941 model output as 300,000. Thus, out of the sales price of every car to the dealer, \$40 represents investment in plant and equipment.

Preview of new Cadillac models last week marked finis to the preview season and confirmed the report published here several weeks ago that the La Salle model would be discontinued for 1941, a less expensive Cadillac series taking its place.

Nicholas Dreystadt, general manager of the division, gave some interesting statistics on the amount

of work being done by Cadillac for the Allison division of GM, currently building 1000-horsepower 12-cylinder-in-line aircraft engines. Cadillac now employs 1300 men in its aircraft parts division which occupies 200,000 square feet of floor space. Connecting rods, camshafts, crankshafts, piston pins, main and connecting rod bearings, balancers and dampers are being turned out at a rate of 20 sets daily. Preparations are being made to manufacture gear reduction units and rotat-

cent high school, 2.5 per cent college, and 7 per cent none.

Occupations are: 19 per cent on assembly lines and benches, 13 per cent machine tool operators, 10 per cent material handlers, 8 per cent in maintenance divisions, 8 per cent metal finishers, 6 per cent on tool and die operations, 5 per cent on punches and presses, 5 per cent welders, 4 per cent inspection, 3.5 per cent foundry and forge shops, and 18.5 per cent other departments.

Returning from a tour through Oregon, Washington and California, D. U. Bathrick, general sales manager of Pontiac, declares that "crossing the Rockies is like stepping into a new business world. Shipyards and plants are working on a 24-hour basis and the only thing preventing payrolls from getting any bigger is an absolute lack of skilled men. Streets are full of new cars and dealers are begging for more and faster deliveries. I consider all this western activity a mere rehearsal for the prosperity to come to the entire nation."

Republic Plans Broad Improvement Program

■ An extensive improvement program was announced last week by Republic Steel Corp., Cleveland.

Cleveland—Installation of a 4-stand, 4-high, 54-inch cold mill in connection with continuous mill operation. This work includes a new crane and auxiliary equipment. Additional annealing capacity and a new warehouse and shipping building will be added to the strip mill.

Youngstown, O.—No. 4 blast furnace will be enlarged, relined and rebuilt. Included will be a new skip bridge, skip car, stock house and new top, to increase capacity 10 per cent. Soaking pits will be improved, rebuilt and enlarged in both the open-hearth and the bessemer blooming mills.

The company reported its new continuous butt weld pipe mill was put in operation last week. Second of its type, the mill was designed to fabricate pipe in lengths to 55 feet and ranging in diameter from 1 to 4 inches. Its maximum capacity will be about 25 tons per hour. Average production over the full range of pipe sizes is expected to be about 17 tons per hour.

Canton, O.—Work will begin next month on installing a fourth 50-ton electric furnace.

Monroe, Mich.—A 4-high, single-stand skin pass mill will be installed to finish coils from the Cleveland strip mill.

Gadsden, Ala.—Soaking pits in the Gulfsteel blooming mill will be improved, rebuilt and enlarged.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

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

Estimated by Ward's Reports

Week ended:	1940	1939†
Aug. 31	27,645	25,240
Sept. 7	39,665	26,865
Sept. 14	66,615	41,245
Sept. 21	78,820	53,950
Sept. 28	95,990	62,755

†Comparable week.

ing guide vanes. Employment will be increased to 3000 by the first of the year.

■ TWENTY-SECOND edition of *Automobile Facts and Figures*, annual publication of the Automobile Manufacturers association, presents a host of new statistical information, including an illuminating analysis of the characteristics of 300,000 workmen in the automobile industry in this country. The survey shows that 64 per cent were born in the middle west, 10 per cent in the south, 8.5 per cent in other sections of the country, 2.5 per cent in Canada, and 15 per cent in foreign countries. By age groups, 40 per cent are 40 or over, 36 per cent are 30 to 39, and 24 per cent are under 30.

Most workmen are married and have families, 20 per cent having two dependents, 19 per cent one dependent, 14 per cent three, 16 per cent four or more, and 8 per cent no dependents; 23 per cent are single. In education, 62.5 per cent have grade school training, 28 per

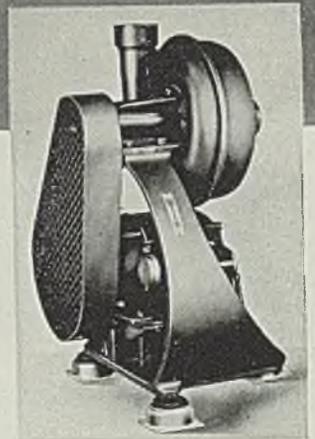


Nine Billion Revolutions ... no Relubrication

WHEN they mounted these New Departure Self-Sealed ball bearings on their blower shaft for testing, the Allen-Billmyre Company of South Norwalk, Conn., were looking for bearings that would give them dependable, long-life operation *minus* the cost and bother of frequent lubrication.

More than 15,000 hours, 24 hours a day, at nearly 10,000 r.p.m., or the equivalent of over 6 years normal operation, with the bearings still going strong, demonstrated beyond doubt that they had found what they wanted in these pioneer Lubricated-for-Life bearings.

Remember: When it's a matter of bearings, New Departure engineers are always "at your service." Nothing rolls like a ball.



"Sealed!" is the title of an intensely interesting booklet describing the development and many uses of the self-sealed bearing pioneered by New Departure. Booklet D-10 free upon request. New Departure, Bristol, Conn.

NEW DEPARTURE

PIONEER OF THE SELF-SEALED BEARING

2925

Research Under Way on Hot Metal Desulphurization by Alkali

■ A LARGE-SCALE practical investigation into the use of alkali for external desulphurization of hot metal has just been undertaken at the Monessen, Pa., plant of the Pittsburgh Steel Co. Work is being sponsored by the committee on blast furnace and raw materials, iron and steel division, American Institute of Mining and Metallurgical Engineers. A month to six weeks will be required to complete tests.

The research was approved by the blast furnace and research committee last spring, at which time its committee on research, comprising A. J. Boynton, consulting engineer, chairman, and H. W. Johnson, Inland Steel Co., both of Chicago, was authorized to arrange with some steel company to undertake such tests, in co-operation with the Solvay Process Co., Syracuse, N. Y., which had offered the services of its chemists and the necessary supply of about 100 tons of soda ash.

The first two weeks will be devoted to observation of normal practice at the Monessen plant, with data assembled on hot metal, slag, waste gas, yields, limestone, air blast, furnace and ladle linings.

Following these observations,

work will be changed over to "lean slag" practice by gradually taking off limestone until the slag is so lean that the sulphur in the iron will run about 0.03 per cent, assuming that in normal practice the sulphur runs about 0.035 per cent or under. The silicon probably will be kept about the same, although it may later be deemed advisable, it is said, to increase the silicon as well as the sulphur for part of the run, and make the same set of observations as under normal and lean slag practice.

Increase Tonnage, Lower Cost?

It is also proposed in order to evaluate certain alkalies, mixtures and additions, to make observations in connection with the forms of alkali, auxiliary additions to alkali, and application of alkali and mixing; also to study the effect of furnace variables upon efficiency, the disposition and effects of alkali slags, alkali fume and refractories.

Observations will also be made at open-hearth furnaces and blooming mill to determine the effects of desulphurized hot metal on time, tonnage, quality and ultimate costs, taking care that steel works condi-

tions are comparable before and during the trial.

Charles Labeka, plant metallurgist, Pittsburgh Steel Co., will be in charge of observations, and M. M. Wheldon, superintendent of blast furnaces for that company, who has had many years experience in external desulphurization, will direct the application of soda ash. Harry J. Schwartz will be observer for the Solvay Process Co., and Mr. Boynton for the sponsoring committee.

It is the belief in some quarters that the experiment will develop a practice which will provide increased tonnage at lower cost, and of lower sulphur content.

Considerable time probably will be required to collect and properly correlate the data. Eventually a paper will be prepared for presentation at some future meeting of the blast furnace and raw materials committee and subsequently for publication by the institute.

The next meeting of the committee, of which Ralph H. Sweetser, New York, is chairman, will be held in Cleveland, Oct. 21, at the time of the National Metal congress. However, only an outline of results will be presented at that time.

Court Ends Litigation Over Steckel Patents

■ Litigation in the Steckel patent case brought by Cold Metal Process Co. against Carnegie-Illinois Steel Corp. and United States Steel Corp. has been concluded.

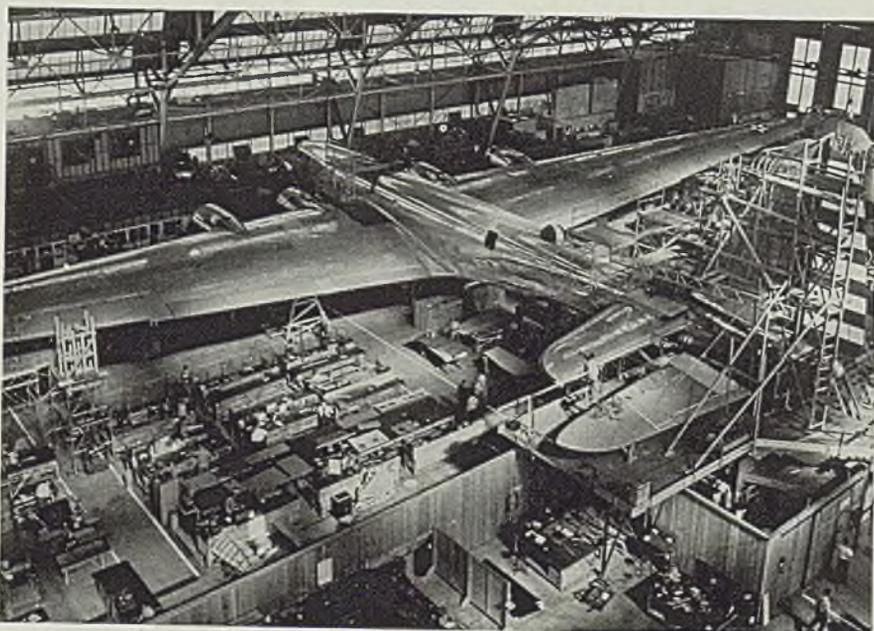
As previously reported (STEEL, Sept. 9, p. 33) the parties entered into a license agreement, Aug. 30, while a rehearing was pending in the circuit court of appeals in Philadelphia, after the United States Supreme Court had twice refused to review the case.

The court of appeals was notified of the settlement and on Sept. 20 entered an order, which in effect canceled all previous decisions. In so doing it vacated its own prior decision which had held one of the patents valid, and also wiped out a decision of a lower court which held another one of the patents invalid.

On the same day the court of appeals dismissed petitions which had been filed by United Engineering & Foundry Co. of Pittsburgh, and Harry Frease, Canton, O., an attorney representing independent steel companies. These companies wanted the court to decide the validity of the patents.

Under the agreement, Cold Metal will receive from the Steel corporation \$4,000,000 cash, and royalties hereafter on a tonnage basis. It was announced at the time of the settlement that equally favorable terms and royalties will be available to other steel companies.

"Guardian of a Hemisphere"



■ Nearly completed in Douglas Aircraft Co.'s Santa Monica, Calif., plant is the army's B-19 super bomber, claimed to be the largest airplane in the world. Capable of taking off with a gross weight of 164,000 pounds, the ship soon will undergo army tests. It is powered by four 2000-horsepower Wright Duplex Cyclone engines and can carry enough gasoline for a 7500-mile nonstop flight. Its armament is a closely guarded government secret

MEN of INDUSTRY

■ **GEORGE H. JOHNSON** has been elected president, Gisholt Machine Co., Madison, Wis., succeeding his father, Hobart S. Johnson, who becomes chairman of the board. H. S. Johnson Jr. has been elected a vice president.

H. E. Coombe, vice president and general manager, the William Powell Co., Cincinnati, has been elected to the board of directors, the Crosley Corp., Cincinnati. He fills the vacancy created by the resignation of Powell Crosley III as vice president and director.

S. C. DuTot has been appointed division sales manager, Electro Metallurgical Sales Corp., unit of Union Carbide & Carbon Corp., New York, in charge of sales activities in the Birmingham, Pittsburgh, Cleveland and Detroit areas. He will maintain headquarters at Pittsburgh. A district office will be maintained at Cleveland, with E. E. Wright as manager, and at Birmingham, with F. H. Hanson handling sales and service in the southeastern states.

W. E. Remmers has been named division manager in the Chicago area and **R. E. Brown** will be division manager of the West coast, with headquarters at San Francisco.

Harry F. Thorne has been appointed general sales manager in charge of sales of industrial, specialty and illuminating glassware of Kopp Glass Inc., Swissdale, Pa. Mr. Thorne will maintain headquarters at 1 East Forty-second street, New York, and also an office and staff at 205 West Wacker drive, Chicago.

E. A. Darling, vice president, International Selling Corp., 26 Weaver street, New York, left recently by Atlantic Clipper for Europe where he will visit France, Spain and Portugal. The corporation imports ores, metals and chemicals, and exports machinery and other products.

M. D. Bensley has been appointed assistant to the president, Shenango-Penn Mold Co., Dover, O. The past ten years he has covered the Pittsburgh sales territory for the company. **H. H. Zollar**, associated with the organization in various capacities in the plant and office since 1926, will replace Mr. Bensley in the Pittsburgh district.

R. L. Hibbard, heretofore associated with the New York office of



F. W. Werner

Whose appointment as assistant to president in charge of coke by-product sales of all subsidiary companies of the United States Steel Corp. was reported in *STEEL*, Sept. 23, p. 85

Cutler-Hammer Inc., Milwaukee, has been transferred to the merchandising sales staff of the Detroit office. He joined the company in 1936, following graduation from Cornell university.

Dr. J. V. N. Dorr, head of the Dorr Co. Inc., and inventor of the Dorr Classifier, the Dorr Thickener and many other devices, will be awarded the Perkin medal of the Society of Chemical Industry for 1941. Presentation will be made at the Chemists' club, New York, Jan. 10.

W. S. Fernholz has been appointed Chicago district sales and service



M. J. McKeever

Who has been appointed manager of Crucible Steel Co. of America's Atlanta, Ga., branch, as noted in *STEEL*, Sept. 16, p.131

supervisor for the alkali division, Detroit Rex Products Co., Detroit. His territory will include Illinois, Missouri, Wisconsin, Iowa, North Dakota and South Dakota. **L. Camel** has been appointed to a similar position in the Cleveland district and will supervise Ohio, Kentucky, West Virginia, western Pennsylvania and western New York.

Whiting Corp., Harvey, Ill., has acquired the Quickwork Co., formerly of St. Marys, O., and Chicago, and has placed **Stevens H. Hammond**, Whiting vice president, in charge of all Quickwork operations. The entire Quickwork line, including rotary shears, stamping trimmers and forming machines, power hammers, throatless shears and flangers, will be manufactured at Whiting's Harvey plant. **Paul V. Hyland**, formerly of Whiting's industrial division, has been named Quickwork sales manager. **B. W. Packer**, formerly of the Quickwork Co., will be chief engineer, and **S. M. Steinko** will have charge of advertising.

Henry J. McKenzie, executive vice president and general manager, Sterling Pump Corp., Hamilton, O., has been appointed president. He succeeds **Maurice Rothschild**, who will continue as a director.

Ralph N. DuBois, project engineer for Aviation Mfg. Corp., Lycoming division, Williamsport, Pa., has resigned to become executive engineer for the recently organized aircraft division of Packard Motor Car Co., Detroit.

J. H. Marks has been named vice president in charge of procurement, machinery and accessories, Packard Motor Car Co., Detroit. **Mr. Marks**, who has been purchasing agent for Packard since 1925, will supervise construction and equipping of new buildings for the manufacture of Rolls-Royce aircraft engines.

H. J. Berman, planning department manager for the Edison General Electric Appliance Co., Chicago, will become works manager for **A. J. Lindemann & Hoverson Co.**, Milwaukee, Oct. 1.

Dr. F. B. Jewett will resign as president of Bell Telephone Laboratories Inc., New York, Oct. 1, to become chairman of the board. **Dr. O. E. Buckely**, executive vice president, will become president.

Willkie Cannot Win Alone

■ PRESIDENT ROOSEVELT again was "clever" when he said in Philadelphia, Sept. 20, that "no dictator in history has ever dared to run the gantlet of a really free election."

Also, when he said that he "would rather trust the aggregate judgment of all the people in a factory—the president, all the vice presidents, the board of directors, the managers, the foremen, plus all the laborers—rather than the judgment of the few who may be financially interested."

* * *

The extent to which the 1940 election can be classed as a really "free" election is a matter for debate. In less than eight years that President Roosevelt has been in power he has had sole direction of the expenditure of nearly twenty-five billions over and above the actual cost of running the government. During that time he has held unprecedented powers of patronage. The effect of his spending, of his distribution of patronage, of his policies in general, has been to put under personal obligation to him large masses of the population who look for more favors, without stopping to realize what the ghastly end will be if the policy of deficit spending is continued indefinitely.

* * *

The record also sharply disproves the President's claim to trust in the judgment of all the people in the factory. In any industrial organization the most important function is that of management. Good management entails necessary sales volume, production of saleable goods, control of costs, maintenance of solvency. Without good management there is no work and no

income for anybody. The President's record of adding twenty-five billions to our national debt makes it clear that he has not considered the judgment of all the people in the factory—that is, he has not trusted the judgment of "the president, all the vice presidents, the board of directors," for these men know that disaster always results when outgo continuously exceeds income.

* * *

Now, empowered to spend many additional billions in increasing our military strength, the President appears unbeatable. He approaches the November election armed with what looks very much like a royal straight flush.

In the light of existing circumstances, in the light of all that is involved should President Roosevelt be re-elected to a third term, it is curious that so few business and industrial leaders are actually working to insure a change of leadership in Washington.

* * *

Too many manufacturers and business men are sitting back and permitting events to shape themselves. Too many seem content to gather in the orders, at the same time feeling that they would only invite trouble should they "stick out their necks."

This battle to save constitutional government in this country deserves the active support of every business and industrial executive.

Willkie cannot win alone.

EC Kreutzberg

The BUSINESS TREND

Wladimir Danilow
 1946 T. Ghnicov
 Danilow
 1946 T. Ghnicov



Industry Set for Brisk Pace in October

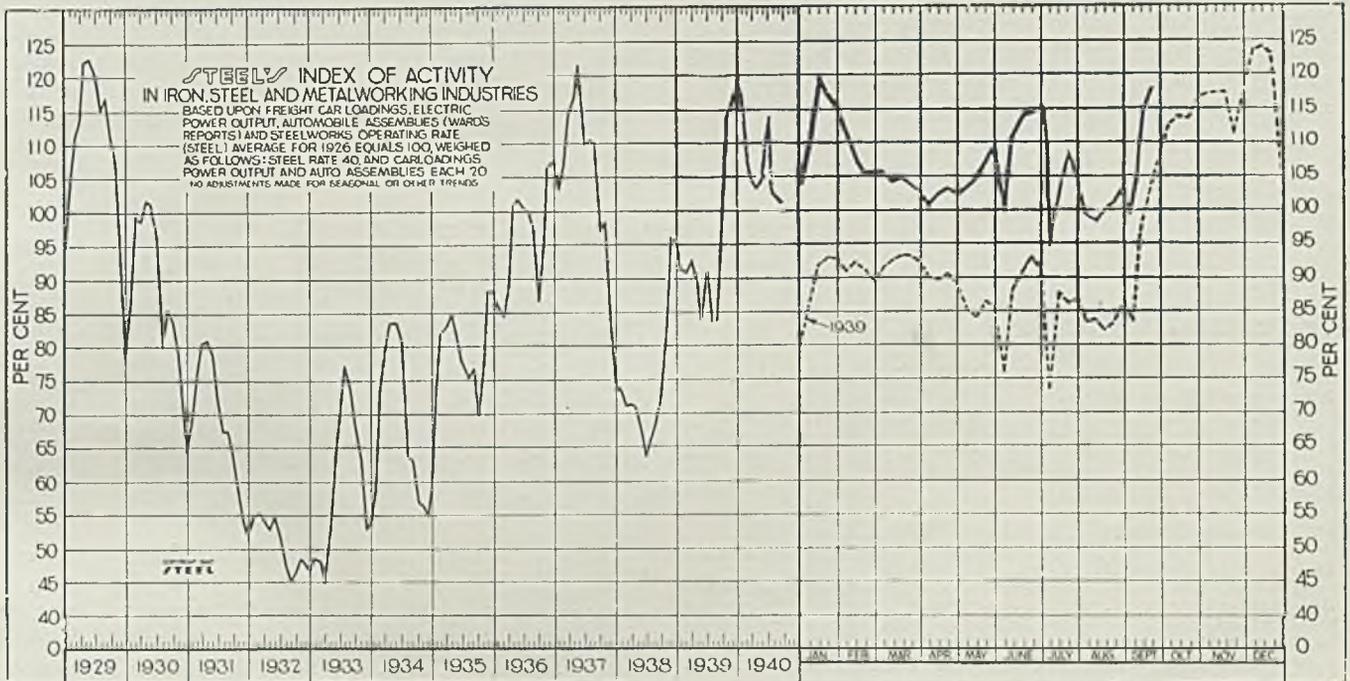
■ OBSERVERS of business trends will recall that in September, 1939, immediately following the outbreak of war in Europe, industrial activity in the United States mounted more rapidly than it had in any one month for many years. For instance, STEEL'S index rose from 85 to 110 in the 30-day period.

A similar spurt has been taking place in September, 1940. For the week ended Sept. 7, 1940, the index stood at 98.7. In the week ended Sept. 21 it had risen to 117.8 and it may go higher before figures for the final week are compiled.

The current expansion in activity is due to two

principal factors, namely seasonal influences and an improved co-ordination of defense effort. The combination of the two is rapidly bringing about a better balance in the operations of the various important branches of industry than has existed at any time since the high point of post-depression activity in 1937. In some respects the distribution of brisk activity throughout the major lines of industry is even more impressive now than then.

This is evident from a cursory study of the conditions in representative industries. Steelworks operations have been maintained at 93 per cent of



STEEL'S index of activity gained 2.9 points to 117.8 in the week ended Sept. 21:

Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
July 13	108.5	87.8	Jan.	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
July 20	106.0	86.0	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
July 27	103.4	86.8	March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
Aug. 3	99.7	83.5	April	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
Aug. 10	98.5	83.9	May	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
Aug. 17	100.8	82.2	June	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
Aug. 24	101.4	83.4	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
Aug. 31	103.5	86.3	Aug.	101.0	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept. 7	98.7	83.7	Sept.	....	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Sept. 14	114.9	97.5	Oct.	....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Sept. 21	117.8	103.0	Nov.	....	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
			Dec.	....	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

THE BUSINESS TREND—Continued

capacity through two weeks and will continue at approximately that level for some time. A year ago the rate was just under 80 per cent; two years ago it was 48 per cent.

Automobile production is mounting steadily in a curve that is gradually tracing a wider margin of output over comparable 1939 records. For instance, in the late weeks of August, weekly output in 1940 was running about 3000 cars above the correspond-

Where Business Stands

Monthly Averages, 1939 = 100

	Aug., 1940	July, 1940	Aug., 1939
Steel Ingot Output	138.5	128.8	97.4
Pig Iron Output	141.2	135.4	99.4
Freight Movement	113.5	107.8	103.4
Building Construction	140.2	134.7	105.6
Wholesale Prices	100.4	100.8	97.3
Automobile Production	28.9	79.2	33.2

ing weekly production in 1939. In the week ending Sept. 21, 1940, assemblies totaled 78,820, contrasted with 53,950 in the comparable week last year. This is a margin of 24,870 cars, indicating that motordom is away to a flying start on its 1941 program.

Power and transportation figures, which are indicators of industrial activity generally, reflect important gains since Labor day. Electric power output receded slightly in the week ended Sept. 21, but it continues to run well above 1939 levels and will establish several new all-time records between now and the annual peak period in December.

The Barometer of Business

Industrial Indicators

	Aug., 1940	July, 1940	Aug., 1939
Pig iron output (daily average, net tons)	136,599	130,984	96,122
Iron and steel scrap consumption (gross tons) ..	3,968,000	3,526,000	2,675,000
Gear sales index	191	141	96.0
Finished steel shipments (net tons)	1,455,604	1,296,887	885,636
Ingot output (average weekly; net tons)	1,361,859	1,265,853	957,561
Dodge bldg. awards in 37 states (\$ valuation)....	\$414,941,000	\$398,673,000	\$312,328,000
Automobile output	89,866	246,171	103,343
Coal output, tons	39,240,000	36,080,000	34,688,000
Business failures; number	1,128	1,175	1,126
Business failures; liabilities	\$12,997,000	\$16,213,000	\$12,637,000
Nat'l Ind. Conf. board (25 industries, factory):			
Av. wkly. hrs per worker†	38.1	38.0	37.1
Av. weekly earnings† ..	\$28.16	\$28.23	\$26.64
Cement production, bbls.†	12,299,000	12,514,000	12,644,000
Cotton consumption bales	655,000	598,000	631,000
Car loadings (weekly av.)	743,670	706,438	677,534

†July, June and July respectively.

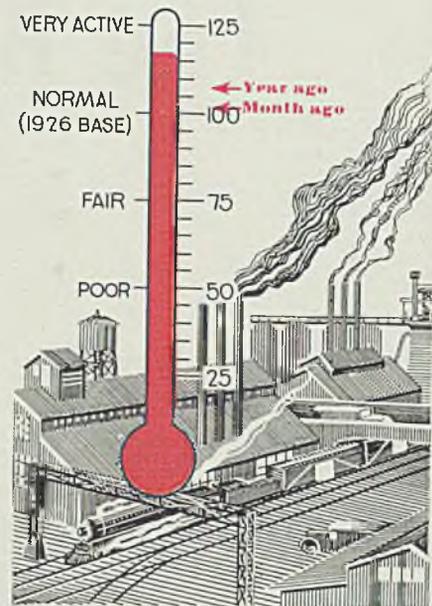
Foreign Trade

	July, 1940	June, 1940	July, 1939
Exports	\$317,015,000	\$350,242,000	\$229,631,000
Imports	\$232,258,000	\$211,390,000	\$168,910,000
Gold exports	\$8,000	\$1,249,000	\$9,000
Gold imports	\$519,983,000	\$1,164,224,000	\$278,645,000

Industrial Weather

TREND:

Upward



Revenue freight car loadings registered a new high for weekly traffic in 1939 in the week ending Sept. 14, and then promptly surpassed that achievement by moving 815,000 cars in the week ending Sept. 21. The high point of the year, usually touched in October, may be slightly higher in 1940 than in 1939.

Much of the effect of increased bookings of defense contracts has not yet been reflected in production statistics. It will be interesting to see whether this work will get underway in time to bolster industrial activity during the latter part of the fourth quarter, and if so, whether the volume will be sufficient to erase the usual seasonal letdown of that period.

Financial Indicators

	Aug., 1940	July, 1940	Aug., 1939
25 Industrial stocks	\$163.98	\$162.64	\$176.84
25 Rail stocks	\$19.98	\$19.57	\$20.71
40 Bonds	\$72.02	\$71.64	\$71.49
Bank clear'gs (000 omit'd)†	\$22,939	\$21,838	\$21,576
Commercial paper rate, (N. Y., per cent)	½-¾	½-¾	½-¾
*Com'l. loans (000 omitted)	\$8,509,000	\$8,517,000	\$8,209,000
Federal Reserve ratio (per cent)	89.3	89.2	86.9
Capital flotations; (000 omitted)			
New capital	\$129,104	\$396,071	\$112,629
Refunding	\$152,265	\$294,138	\$348,636
Federal gross debt, (mil. of dol.)	\$43,905	\$43,771	\$40,896
Railroad earnings†	\$57,084,209	\$47,419,440	\$48,996,611
Stock sales, New York stock exchange	7,616,050	7,306,720	17,372,281
Bond sales, par value	\$79,592,825	\$98,166,050	\$111,416,850

*Leading member banks Federal Reserve System.

†July, June and July respectively.

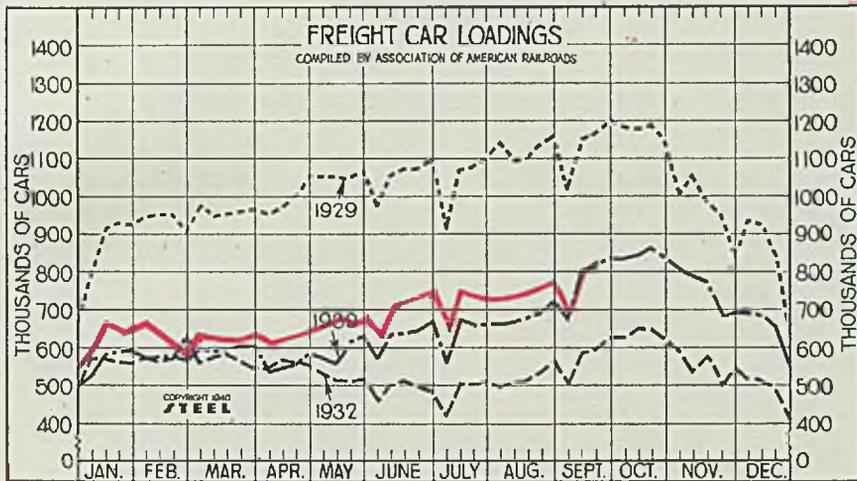
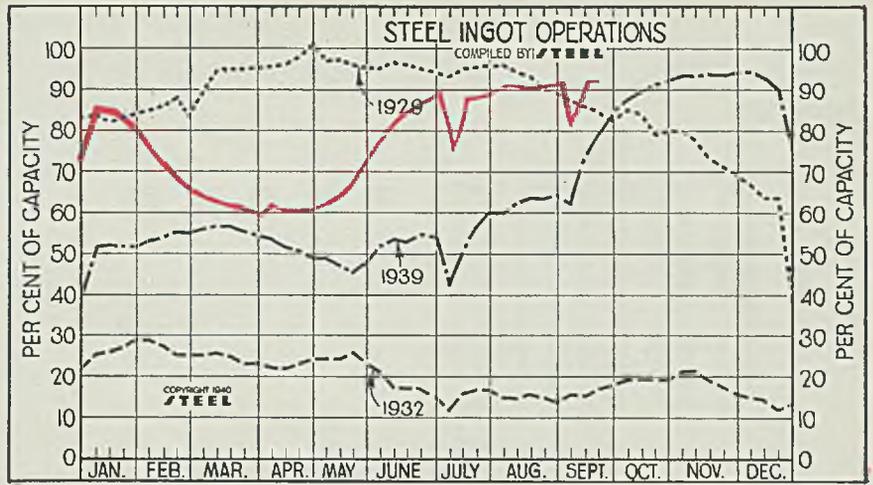
Commodity Prices

	Aug., 1940	July, 1940	Aug., 1939
STEEL's composite average of 25 iron and steel prices	\$37.70	\$37.63	\$35.95
U. S. Bureau of Labor's index	77.4	77.7	75.0
Wheat, cash (bushel)	\$0.90	\$0.92	\$0.84
Corn, cash (bushel)	\$0.81	\$0.79	\$0.59

Steel Ingot Operations

(Per Cent)

Week ended	1940	1939	1938	1937
June 22	88.0	54.5	28.0	74.0
June 29	89.0	54.0	28.0	77.5
July 6	75.0	42.0	24.0	74.0
July 13	88.0	50.5	32.0	82.0
July 20	88.0	56.5	36.0	81.0
July 27	89.5	60.0	37.0	84.0
Aug. 3	90.5	60.0	40.0	84.5
Aug. 10	90.5	62.0	40.0	84.0
Aug. 17	90.0	63.5	41.5	81.0
Aug. 24	90.5	63.5	43.5	83.0
Aug. 31	91.5	64.0	44.5	83.0
Sept. 7	82.0	62.0	41.5	72.0
Sept. 14	93.0	74.0	46.0	80.0
Sept. 21	93.0	79.5	48.0	76.0



Freight Car Loadings

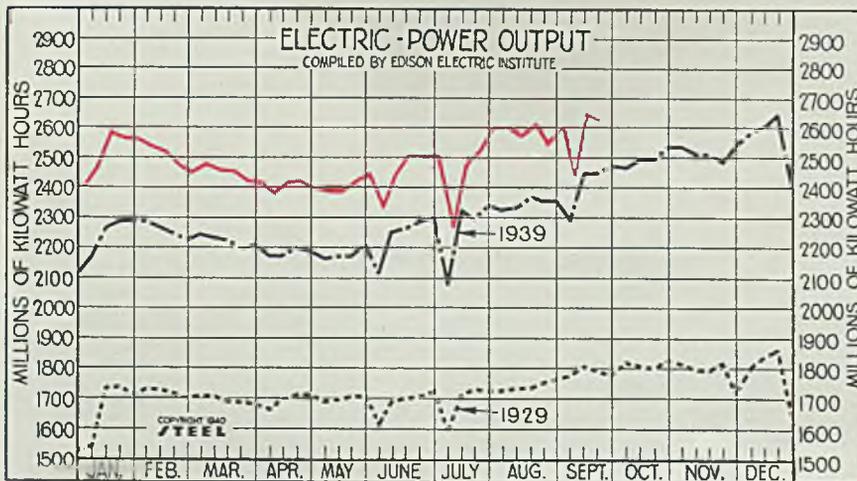
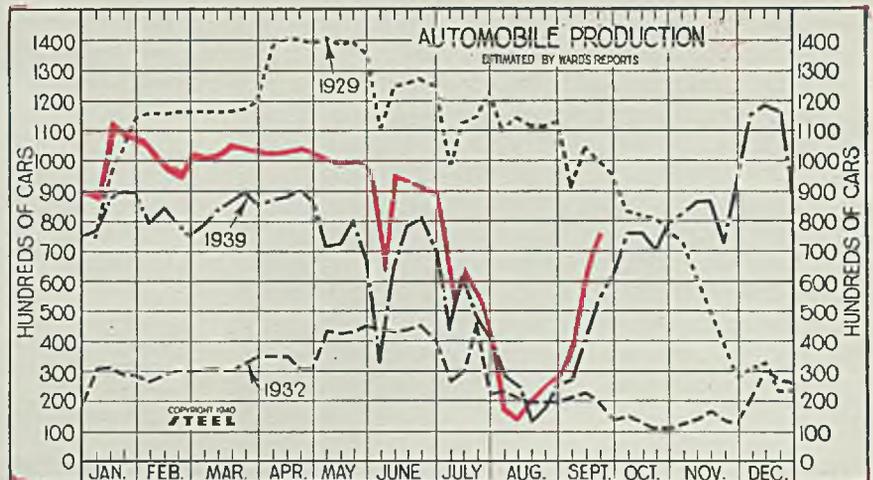
(1000 Cars)

Week ended	1940	1939	1938	1937
June 15	712	638	556	756
June 22	728	643	559	774
June 29	752	666	589	806
July 6	637	559	501	682
July 13	740	674	602	770
July 20	730	656	581	771
July 27	718	660	589	783
Aug. 3	718	661	584	770
Aug. 10	727	665	590	777
Aug. 17	743	674	598	781
Aug. 24	761	688	621	787
Aug. 31	769	722	648	805
Sept. 7	695	667	569	711
Sept. 14	804	806	660	837
Sept. 21	815	815	676	840

Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
June 22	90.1	81.1	40.9	121.0
June 29	87.6	70.7	40.9	122.9
July 6	52.0	42.8	25.4	101.0
July 13	62.2	61.6	42.0	115.4
July 20	53.0	47.4	32.1	88.1
July 27	34.8	40.6	30.4	86.4
Aug. 3	17.4	28.3	14.8	78.7
Aug. 10	12.6	24.9	13.8	103.3
Aug. 17	20.5	13.0	23.9	93.3
Aug. 24	23.7	17.5	18.7	83.3
Aug. 31	27.6	25.2	22.2	64.2
Sept. 7	39.7	26.9	17.5	59.0
Sept. 14	66.6	41.2	16.1	30.1
Sept. 21	78.8	53.9	20.4	28.0



Electric Power Output

(Million KW/H)

Week ended	1940	1939	1938	1937
June 22	2,509	2,285	2,019	2,238
June 29	2,514	2,300	2,015	2,238
July 6	2,265	2,088	1,881	2,096
July 13	2,483	2,324	2,084	2,298
July 20	2,524	2,295	2,085	2,259
July 27	2,601	2,342	2,094	2,256
Aug. 3	2,605	2,325	2,116	2,262
Aug. 10	2,589	2,333	2,134	2,301
Aug. 17	2,606	2,368	2,139	2,304
Aug. 24	2,571	2,354	2,134	2,295
Aug. 31	2,601	2,357	2,149	2,321
Sept. 7	2,463	2,290	2,048	2,154
Sept. 14	2,639	2,444	2,215	2,281
Sept. 21	2,629	2,449	2,154	2,266

Testing

FOUND IMPORTANT IN REDESIGN

By changing one factor at a time and by making detailed production tests on each deviation, accurate information is obtained which helps to design machines having remarkable performance

■ AFTER MANY tests had indicated that existing end-milling cutters could be improved, particularly those used for removing large amounts of stock, important changes were made and the present line of Brown & Sharpe end mills developed. Five years' use has resulted in outstanding records of improved performance and longer life. In the representative tests described here, it should be noted that the power consumed by the new-design mills is much less than by the older mills: This means that the freer cutting action will give much better performance at the same feed or greater metal removing capacity at a greater feed. This is borne out by the following test: Material cut was 0.12 to 0.20 per cent carbon; 0.50 to 0.75 manganese; 0.45 to 0.75 chromium; 1.00 to 1.50 nickel; 0.020 maximum phosphorus and sulfur. This corresponds closely to SAE 3115, has a hardness of 137 brinell. Conditions of cut were: Diameter of mill, $\frac{1}{2}$ -inch; face width of cut, $\frac{3}{4}$ -inch; revolutions per minute, 560; depth of cut, 0.150-inch; feed rate, $4\frac{1}{8}$ inches per minute.

The power consumed by the machine under varying conditions as indicated by a wattmeter was as follows:

By N. B. MacLAREN
Experimental Engineer
And
L. R. MAYO
Cutter Engineer
Brown & Sharpe Mfg. Co.
Providence, R. I.

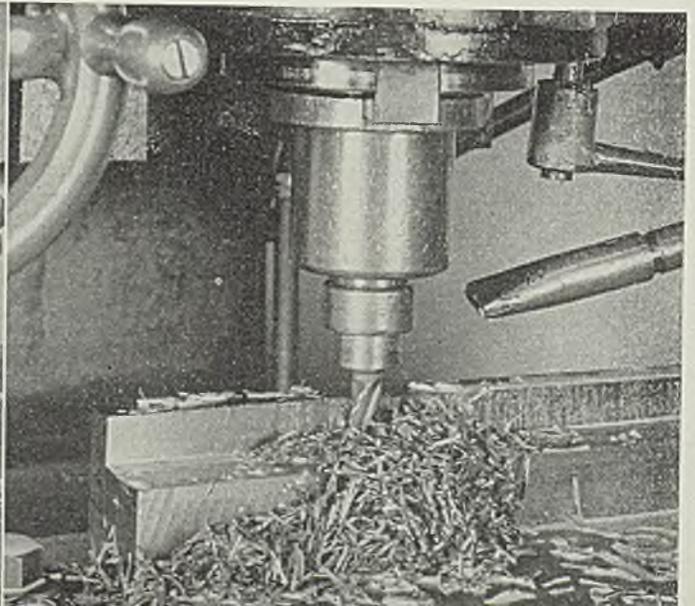
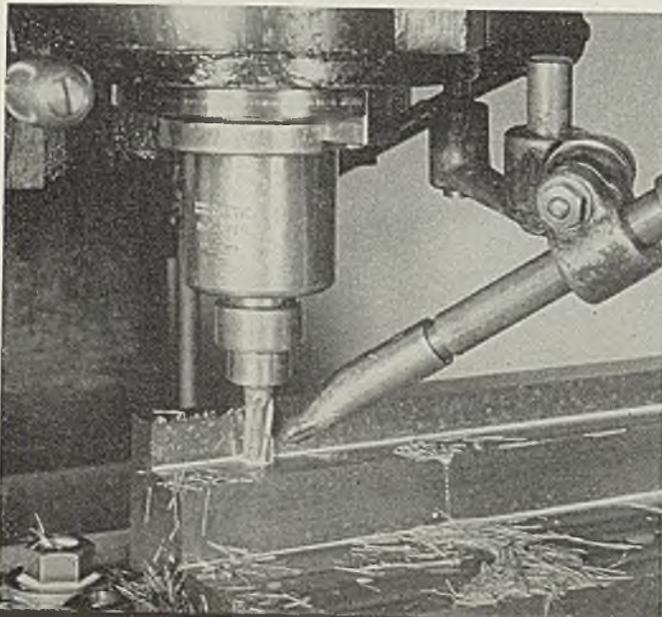
	Power (Watts)	
	Old Design	New Design
Total Power	1300	1050
Idle Machine Power	900	900
Cutting Power	400	150

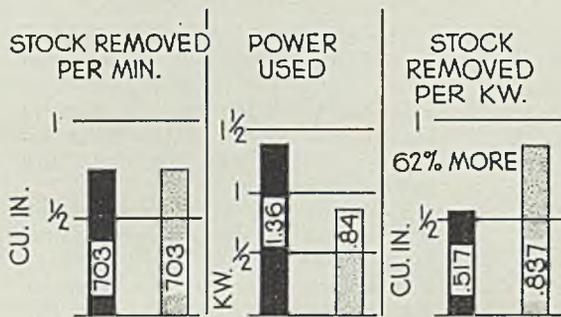
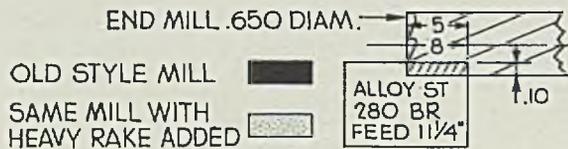
Thus for the same cut the new mill consumed 150 watts against 400 for the old. In other words, the old mill required 167 per cent more power.

Further to demonstrate the improved cutting ability of the new mill, the feed was increased to $6\frac{1}{8}$ inches whereupon the power consumption was only 250 watts. This was still 150 watts lower than the old mill at $4\frac{1}{8}$ -inch feed.

Fig. 1 shows the old mill in operation. Note the fine chips. These actually were blue in color, indicating that undue heat was generated by the cut in spite of ample coolant. That the finished surface was ragged, or in shop parlance "a teary surface", also is obvious in the photo. Note, in the illustration, the

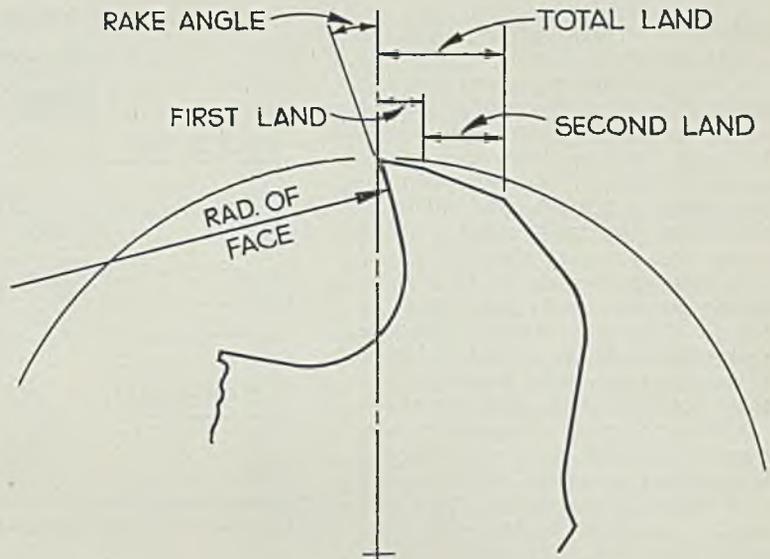
Fig. 1, left, shows old mill in operation. Note fine chips, ragged surface, bad burr. Fig. 2, right, shows same cut in same block but made by new-type mill and with large sheared chips, better surface and no burr





NEW STYLE MILLS PRODUCED 4½ TIMES AS MANY PIECES PER SHARPENING

Fig. 3, left, shows remarkable effect of adding heavy rake. Fig. 4, right, is view of single tooth of latest type 4-tooth mill with generated type of face



bad burr thrown up at the top of the finished surface. Fig. 2 shows the same cut as taken in Fig. 1, but with the new-type mill. Note here the large, sheared chips with no trace of discoloration from heat. The finished surface is better, and practically no burr is thrown up on the upper edge of the cut.

This demonstrates the ability of the new mill to remove metal more easily as shown by the power consumed and with a better finish. Absence of undue heat during the cut assures longer life between sharpenings.

Design of the New End Mills: In the newly designed end mills, departures from past practice include: Rake angle has been increased; angle of spiral has been increased in most cases; with the exception of 2-lipped mills, the numbers of teeth have been decreased; double sharpened lands have been used in all cases; teeth have been cut by a generating process.

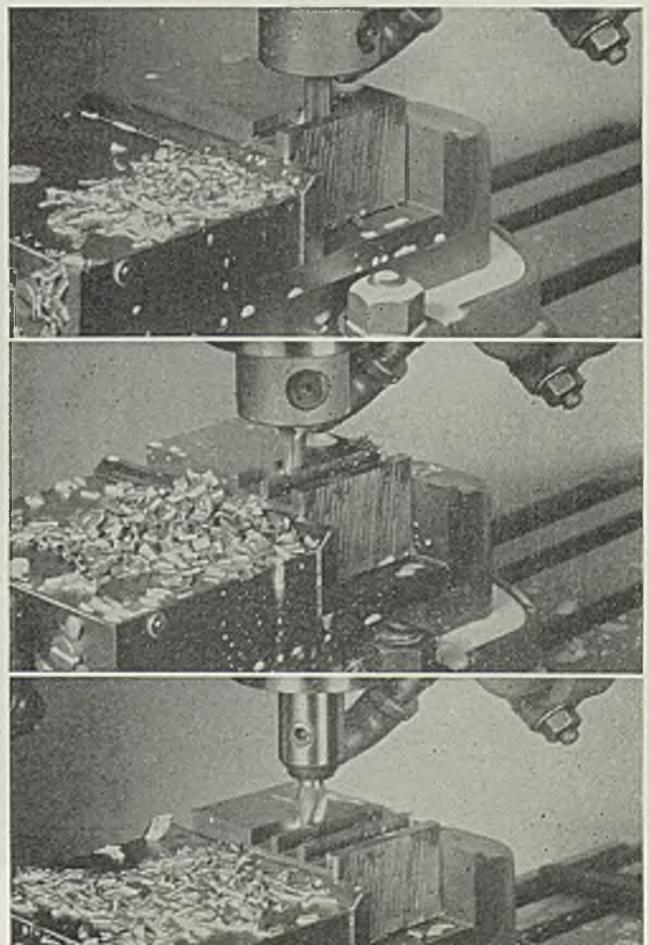
Rake Angle: One of the first experiments was to introduce the single feature of increased rake. The results obtained were striking. These are shown diagrammatically by Fig. 3. Incidentally, the chips produced with the modified and the old-design mill are entirely different in shape. Furthermore, those produced by the old-design mill are of a dark blue color, while those cut with the new mill are entirely uncolored. A flood of cutting compound was of course used in each case. Note particularly the difference in power consumed and in the number of pieces produced per sharpening. As a result, increased rake angles have been adopted for all of our new end mills and 2-lipped mills.

Use of increased angle of spiral and fewer teeth are two inter-related factors and so will be considered together. It has long been realized that higher angles

Figs. 5, 6 and 7, from top to bottom respectively, indicate effect of adding spiral. Fig. 5 mill has no spiral, Fig. 6 has 12-degree spiral, Fig. 7 a 30-degree spiral

of spirals contribute to smoother cutting action; also, that the use of fewer teeth increases cutting efficiency. One factor which is introduced by the use of a larger spiral angle is that the end tooth becomes more acute which, in itself, might suggest weakness. This has been offset by increasing the amount of metal in back of the cutting edge. This increase is made practical by the use of a lower number of teeth, thus increasing the pitch. Not only does this compensate for the increased size of tooth but also it provides more chip room than was formerly available.

These factors of larger spiral angle and lower number of teeth have been incorporated in all new 2-lip mills, in 4-lip long straight shank mills up to 3/8-inch diameter, in regular 4-lip mills up to 1 1/16-inch



and in 6-lip mills from 11/16 to 2 1/16 inches in diameter.

A test was run to demonstrate the superior cutting ability of increased spiral angles on small end mills. Material was cast iron; face width of cut, 1/4-inch; revolutions per minute, 2600; depth of cut, 1/16-inch; feed rate, variable. Taking the above cut on a straight-tooth end mill gave chatter marks in the finished surface and fine, dust-like chips. The new Brown & Sharpe end mill took the same cut and gave a smooth finish with heavier chips than obtained from previous mills.

Although it is impossible adequately to show it by photographs, the cutting action of the new mill was found much superior. This was readily apparent to the ear, however. The new mill made a clean "singing cut", in contrast to the chatter of the others. The new mill could be held in the hand without discomfort at the end of the cut while the others were too hot to touch.

Double Sharpened Lands: Fig. 4 shows an enlarged view of a single tooth of a 4-tooth mill of the latest type. Note the double land secured by two sharpening operations. Total width of land is a relatively large dimension necessary to secure adequate tooth strength. The introduction of the double sharpening operation permits the use of a stronger tooth in combination with the desired amount of cutting clearance without danger of having the heel of the land rub on the work.

Generated Tooth Faces: Fig. 4 also shows the "generated" type of face characteristic of all these new mills. It is secured by the cutting action of a simple radius located at the outside diameter of the milling

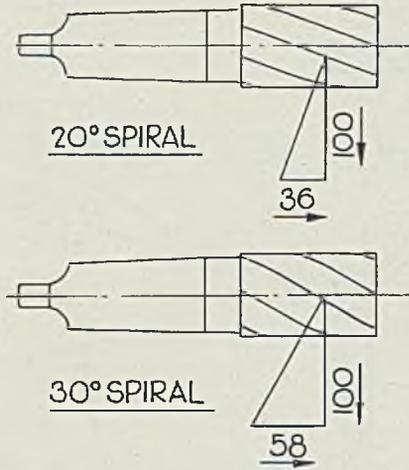


Fig. 8—Comparative pull-out tendency for 20-degree and 30-degree spirals

cutter being used. This radius makes contact with the end mill being cut, from the root to the outside diameter, thus insuring a smooth face. Note that the radius of curvature of the end mill face increases as we approach the outside diameter.

Two-lipped end mills now have a slight spiral. Two-lipped mills formerly made with straight teeth are now being made with a 12-degree spiral—adopted after it had been demonstrated consistently that this change would permit faster feeds. This new mill produces a slot fully as accurate and square as did the previous straight-tooth mill.

A test was made to determine the effect of increasing the spiral on a

Figs. 9 and 10, left and right, demonstrate performance of old and new-design taper-shank end mills in same block of material. Old required 108 per cent more power

2-lipped end mill. One of these end mills had no spiral, the second had a 12-degree spiral, the third a 30-degree spiral. Material was SAE 1020 steel; diameter of mill, 1/2-inch; revolutions per minute, 600; depth of cut, 1/2-inch, feed variable.

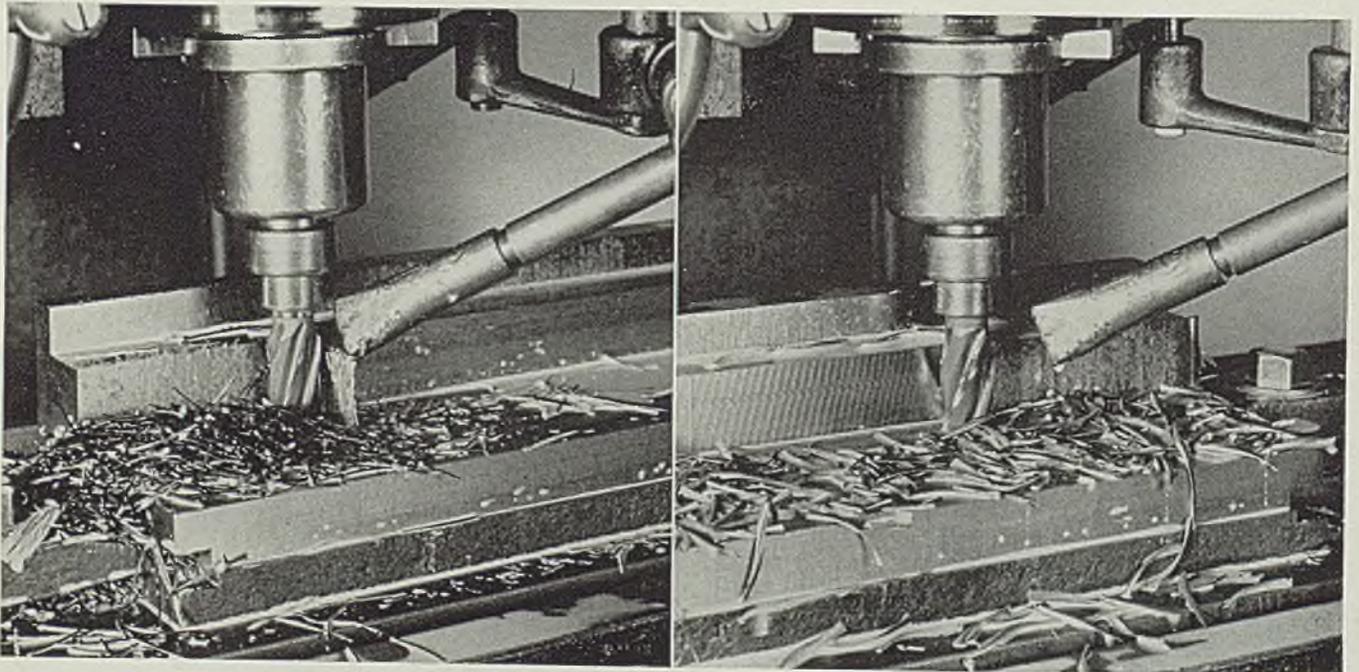
The straight-tooth end mill itself is shown in Fig. 5 as it appeared when taking the foregoing cut in a steel block. While the cut itself is square, the nature of the finish indicates chatter and the chips are light and broken.

The same cut in the same block with a mill having 12-degree spiral is shown in Fig. 6. Here we have a much smoother cut, the chips being heavier and cleanly sheared. The cut likewise is square.

Fig. 7 shows the same cut made in the same block with a mill having 30-degree spiral. The finish is the best of all three and the chips are cleanly sheared. However, the angle of spiral causes the mill to spring, thereby resulting in the cut not being quite square.

The addition of spiral to a 2-lipped end mill undoubtedly is an advantage. The cut is cleaner and the mill has a longer life. Although a mill with 12-degree spiral does not have quite as free a cutting action as one with 30-degree, it will cut a slot more nearly square.

When resharpener the outside diameter of these mills, it becomes necessary to rotate them about their axis as they are moved along the stationary finger. A device for performing this operation consists essentially of a free rotating spindle in which the mill to be sharpened is mounted, either directly or by means of suitable adapters. Users formerly employing Brown & Sharpe spiral 2-lipped mills will find no



new sharpening problem is introduced by the change from straight teeth to those having a 12-degree spiral.

Ground Versus Smoothly Milled Faces: When the experimental work on end mills was started, it was quite generally assumed that ground faces would prove preferable. After extensive tests and using the mills in production work, it seems evident that ground faces do not increase the productive capacity or improve the finish of the work produced. However, emphasis is laid on the fact that this is true only when an exceptionally smooth milling job on the end mill face is secured.

Taper Shank Mills: Any spiral end mill whose hand of cut is the same as the hand of spiral, is subjected to a force tending to pull it out of the spindle when cutting. Fig. 8 shows in diagrammatic form the comparative pull-out tendency for 20-degree and 30-degree spirals as calculated by multiplying the turning force by the tangent of the spiral angle.

When using 30-degree spiral in combination with Brown & Sharpe taper shanks was first considered, it seemed possible that they would give trouble due to a tendency to loosen and pull out. From Fig. 8, it would be correctly assumed that if each mill were taking the same amount of power to drive it, the one with 30-degree spiral would be subjected to the greater pull-out force. However, when the decrease in power required for doing the same job is considered, the calculated thrust or pull-out tendency is substantially the same for either mill. Results of practical demonstrations were more favorable to the 30-degree mill than those obtained by pure calculation. As final conclusions:

Either the 20-degree spiral or the new 30-degree spiral taper shank mill will pull out of the spindle or adapter under such adverse conditions as poor collets, unreasonable combinations of speed and feed, and lack of suitable care when assembling.

When properly mounted, the amount of turning force required to cause the mills to pull out was practically the same. Therefore, considering its freer cutting characteristics, the new 30-degree taper shank mill will do a heavier job than the 20-degree.

In demonstration, taper shank end mills of the old design and new design were used under severe conditions. Material was SAE 3115; hardness, 137 brinell; diameter of mill, $\frac{3}{8}$ -inch; revolutions per minute, 430; face width, $1\frac{1}{4}$ -inch; feed, $9\frac{1}{4}$ inches per minute; depth of cut, 0.150 and 0.200-inch. The comparative turning force for 0.150-inch depth of cut

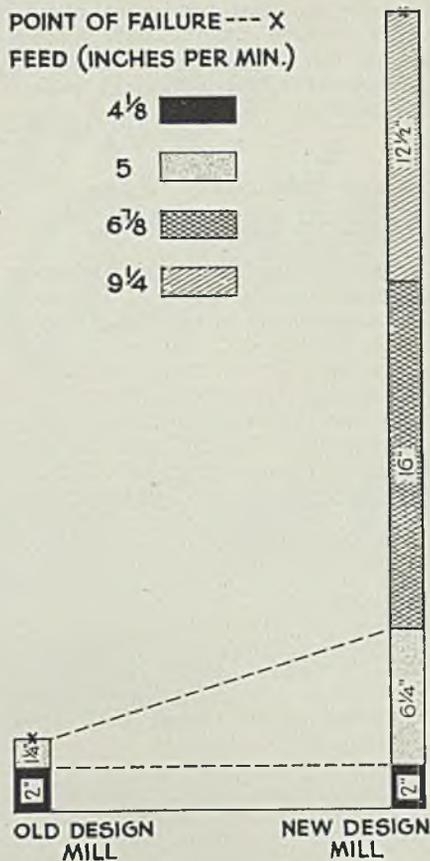


Fig. 11—Graphic comparison of cut taken before failure on old and new type mills. Old mill at failure was cutting at feed of 5 inches per minute against $9\frac{1}{2}$ for new type

for the old and new mills was:

	Power (Watts)	
	Old Design	New Design
Total Power	1825	1200
Idle Machine Power	625	625
Cutting Power	1200	575

This shows 108 per cent more power was required for the old mill.

Fig. 9 demonstrates performance of the old mill. Note the blue narrow chips, burr thrown up on top edge of finished cut, and the "teary" finished surface. The compressing rather than shearing action of the teeth is further indicated by the strip of compressed chips which may be seen building up ahead of the cutter.

The cut completed with a new mill is shown in Fig. 10. Here the chips are large, cool and cleanly sheared from the work. There is no building up of chips ahead of cutter, and an entire absence of burr can be noted at the top of the finished surface. The superior finish obtained by the new mill is clearly shown. Compare with that made by the old mill.

When driving taper shank mills into a spindle or collet, care must be taken on the one hand to see that the mill is firmly seated, and on the

other that the teeth are not abused due to the method used. Use of a lead hammer in some instances has resulted in chipping the corners of the teeth, even though the same mills were giving no trouble in that respect when doing heavy milling jobs.

It is considered better practice to place a suitable brass rod against the bottom of the counterbore and strike it with a steel hammer. In those cases where the diameter of the shank at the large end is materially greater than the diameter of the cut, the use of a suitable steel set which has been drilled out to clear the cutting portion of the mill and bear against the large end of the taper, makes an excellent means of driving the mill into the collet.

Strength and Cutting Ability: A final demonstration shows the advantages of the new design end mill teeth. An end milling operation is performed by an old design mill and a new design mill. Each cutter is operated at periodically increased feed until it fails. Diameter of mills was $\frac{3}{8}$ -inch; revolutions per minute, 900; depth of cut, $3/32$ -inch; feed, starting at $4\frac{1}{4}$ inches per minute and increased periodically to breaking point; material cut, SAE 3115; hardness, 137 brinell. The cut taken by each mill before failure is shown by Fig. 11. The old mill was at point of failure when cutting at feed of 5 inches per minute. The finish was rough with a heavy burr around the top edges. Much heat was generated for the broken cutter was blue in color and the teeth were "dubbed over" with chips welded between them.

The new design mill failed at feed of $9\frac{1}{4}$ inches per minute after completing two cuts the entire length of the test block. The finish was smooth with little burr. Examination of the mill after failure showed no discoloration from heat and no clogging tendency.

Conclusions: The free-cutting action of these new end mills permits them to be operated at feeds prohibitive for other mills. On steels classified by operators as "soft and mushy", use of such cutters results in greatly improved cutting action and in distinct improvement in finish.

In many plants, the machinability of the metal being cut is improved by heat treating and its machining expedited by the use of a special cutting compound. From testing experience, it appears a cutter can be designed to cut properly any grade of steel. In the end mills described, design features are embodied which will give excellent cutting action on most all metals.

Proper care and operation of cutters is essential. When a cutter breaks or chips, seldom is any thought given to other elements that

might have contributed toward breakage such as a machine spindle with worn bearings or improper grinding of the cutter. An end mill operating from a spindle having 0.010-inch lift or play cannot be expected to give as satisfactory performance as one operating from a spindle having proper adjustment. Again, cutters with a clearance of 0.008-inch in 0.025-inch land cannot be expected to stand up as long as those having 0.003-inch in 0.025-inch land, particularly when cutting heat treated alloy steels.

It is essential that a cutter should run true if it is to give maximum performance. Excessive runout places more responsibility on some teeth than on others. Presence of runout generally is caused by abused or poorly maintained adapters, or careless assembly of cutter in adapter or on its arbor. Collets or adapters are frequently seen with the taper hole badly bruised or scored. This condition gives only a partial bearing to the taper shank. Hence slippage is bound to occur and breakage is inevitable.

Modern cutter designs are based on specialized engineering skill and on conclusions drawn from years of experience and testing. The best of steels, with exacting workmanship

and scientific heat treatment, combine to produce cutters which make possible full utilization of the outstanding capabilities of today's milling machines.

Rolled Hastelloy C Has High Strength

■ In addition to its corrosion-resistant properties, Hastelloy C, recently made available in rolled form by Haynes Stellite Co., unit of Union Carbide & Carbon Corp., 30 East Forty-second street, New York, has been found to possess high strength and toughness. Its ultimate tensile strength is in the range of 115,000 to 128,000 pounds per square inch, while its elongation in 2 inches is between 25 and 50 per cent. Brinell hardness is between 160 and 120. It has outstanding resistance to wet chlorine.

Some of the mechanical properties of the alloy in the cast form are a tensile strength of 72,000 to 80,000 pounds per square inch, an elongation in 2 inches of 10 to 15 per cent, and a reduction of area of 11 to 16 per cent. Its normal heat-treated hardness is 175 to 215 brinell.

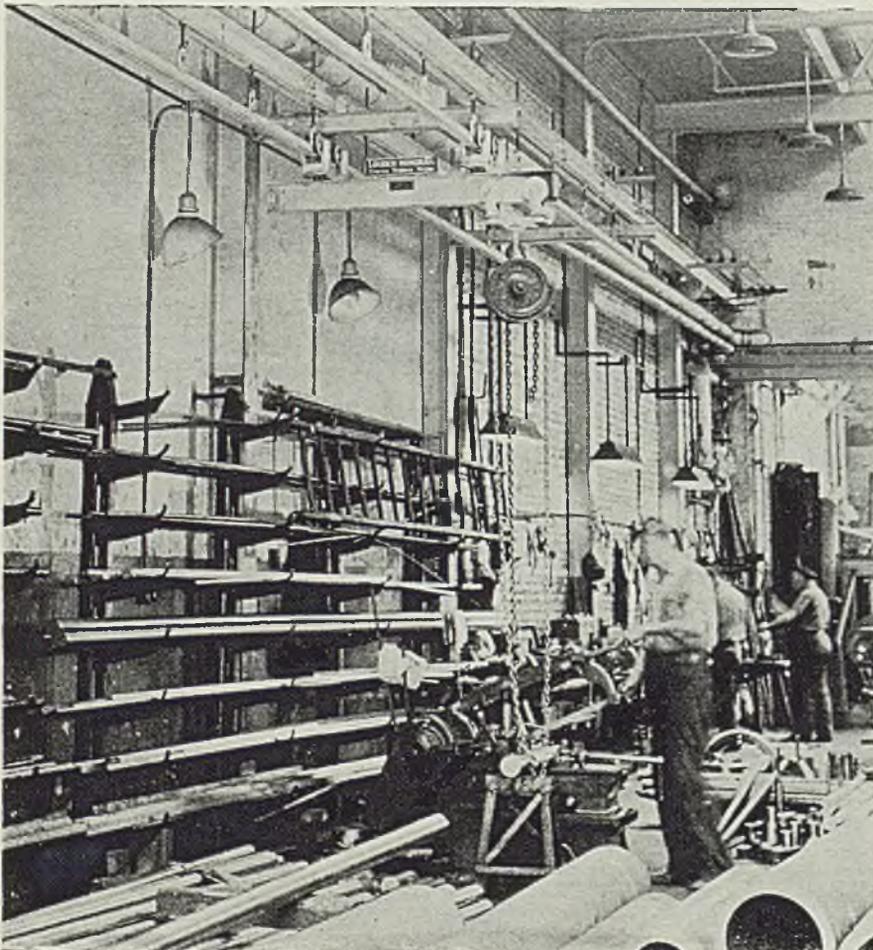
A special hard analysis of this

alloy, with a hardness of 322 to 372 brinell also is now available in cast form.

Material of this specific analysis possesses the same high corrosion-resistance as material of the regular analysis, together with higher resistance to abrasive wear. Hastelloy C sheets and plates are now available in all commercial thicknesses and sizes up to 200 pounds.

Develops New Lathe Tail-Stock Lubricant

■ A more viscous oil, called Center Point Lube, having the consistency of No. 2 grease, is announced by the Chicago Mfg. & Distributing Co., 1428 West Forty-sixth street, Chicago. It is for use in a lathe tail stock and, it is claimed, only one application of this lubricant is required for any one job being turned in the lathe. Precision work is assured because lathe center can be drawn snugly against work—less power being required to operate the lathe because there is no rupture of film in the lubricant caused by work expansion due to heat generating by cutting tools. This material is packaged in one and 5-gallon and drum containers.



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Hoist Arrangement

■ A combination overhead rail and chain hoist serves as a convenient means of handling steel tube and bar stock at the plant of Samuel M. Langston Co., Camden, N. J. Two overhead rails, supported by I-beams extending from the wall, traverse a 60-foot length of the steel storage room, directly over the wall racks of steel tubes and bars. A 4-foot cross-beam travels on rollers the length of the tracks. By means of rollers, a chain hoist can travel the length of the cross-beam—from wall to about 4 feet straight out.

Because of this flexible arrangement, any of the long bar or tube stock in the wall racks can be lifted out and conveyed to one of the machine hacksaws located under the overhead tracks. The desired length of stock can be cut off without removing the long bar from the hoist. Then the remainder of the bar can be easily placed back in the proper rack. The arrangement permits one man to handle all of his own cutting work.

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Age Hardening Of Cold Reduced Strip

By PAUL J. McKIMM
Cleveland

Part I

AGING of low-carbon steels, especially sheets, received little thought until the advent of cold reduced strip. The past few years or so aging has been the most important subject among metallurgists, manufacturers and fabricators of cold strip.

Aging phenomenon is the most widely discussed problem confronting the steel industry today because if necessity forces the industry into production of a nonaging steel, it necessarily means a considerable increase in manufacturing and processing costs.

This unaccountable change in physical properties of steel is relatively an old problem. Theories were advanced to explain its mechanism as early as 1878. Plate steel failures such as caustic imbritlement and cracking at rivet holes were traceable to aging. Considerable research improved riveting technique and later nonaging steels were produced principally by employing excessive use of manganese.

Further failure of plates because of aging were those attributable to various distinct types of fatigue failure. Again, all quenchable high-carbon and alloyed steels were subjected to premature failure due to aging especially quench-aging.

Many metallurgists have forced

the issue of aging and the necessity of producing a high cost nonaging steel to that of primary importance. They maintain that due to aging, loss is incurred by steel mills for failure of material to perform in fabrication.

Briefly the most widely accepted theories on age-hardening are the precipitation of a solute from a supersaturated solid solution; namely, an iron carbide, Fe_3C , being precipitated from a supersaturated solution of carbon in ferrite when low-carbon steels are quenched from subcritical temperatures. This particular type of age-hardening is possible of attainment with heat-treating steels quenched in air with varying rapidity or quenched in varying mediums at varying speeds and temperatures of the quench or of the quenchant. It also may be possible to obtain these aging characteristics or similarities with low-carbon cold strip steels by quenching through the "blue brittle" range.

Factors responsible for strain aging are not so readily identified or comprehended, although oxygen, O_2 , has been suspected as being responsible for the changes noted in the physical properties after cold work deformation. Other elements, namely carbon, nitrogen and phosphorus,

TABLE II—Physical Values After 300 Hours Aging

Heat Number	Rockwell, B-scale	Olsen, inches	Elongation, % in		
			2"	4"	8"
4	52	0.410	48	38	29.0
	52	0.415	54	40	29.0
	52	0.412	50	39	30.5
1, 2 & 3	55	0.400	52	38	29.0
	56	0.398	50	36	28.5
	56	0.400	50	37	28.0
			46	36	28.5

have been studied to a slight extent in order to determine their influence on aging but satisfactory evidence as to the part that these elements play in strain aging has not extended far. In support of oxygen, O_2 , as being the most logically responsible factor in promoting strain aging is the reduced tendency of deoxidized steels to age and the susceptibility of alloys containing little carbon to age or that existant with relatively pure metals.

Strain aging after cold work deformation is then explained on the basis of precipitation of an iron-oxygen compound, $Fe-O_2$, along grain boundaries and slip bands from ferrite supersaturated with oxygen. It is through interfering with slip that these solutes increase hardness.

Another accepted theory is one of "critical size," which is based on the consideration that as precipitated particles grow along slip bands and grain boundaries from submicroscopic dimensions to microscopic dimensions, hardness then decreases. Time is required to produce this so-called agglomeration which, as generally believed, is away from an unstable state and toward a real equilibrium. As a cold rolling treatment is often the

TABLE I—Physical Values Obtained After Skin Passing

Heat Number	Gage	Rockwell, B-scale	Olsen, inches	Elastic limit, p.s.i.	Tensile strength, p.s.i.	—Elongation, % in—		
						2"	4"	8"
1	0.039	43-44	0.430	30,332	44,515	52.5	41.7	33.5
				30,365	45,270	55.0	43.0	33.0
2	0.037	38-40	0.428	32,375	43,625	53.0	43.0	33.5
				32,335	43,195	58.0	44.0	33.0
3	0.038	39-44	0.425	30,545	43,345	52.0	42.0	33.5
				30,795	43,995	54.0	44.0	31.5
4	0.038	40-44	0.427	33,262	46,257	52.0	42.5	32.5
				32,995	45,570	53.5	41.5	33.5

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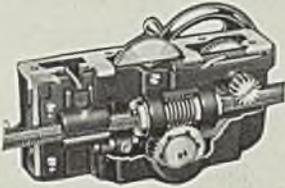
HEADSTOCK. Cutaway view showing integral type bearing and the capillary oiling system.



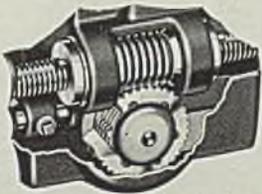
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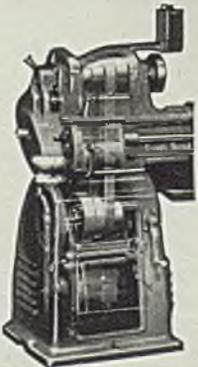
IMPROVED SADDLE and compound rest with adjustable tapered gibs. Cross slide bridge is wide and deep, providing rigid support for the tool rest.



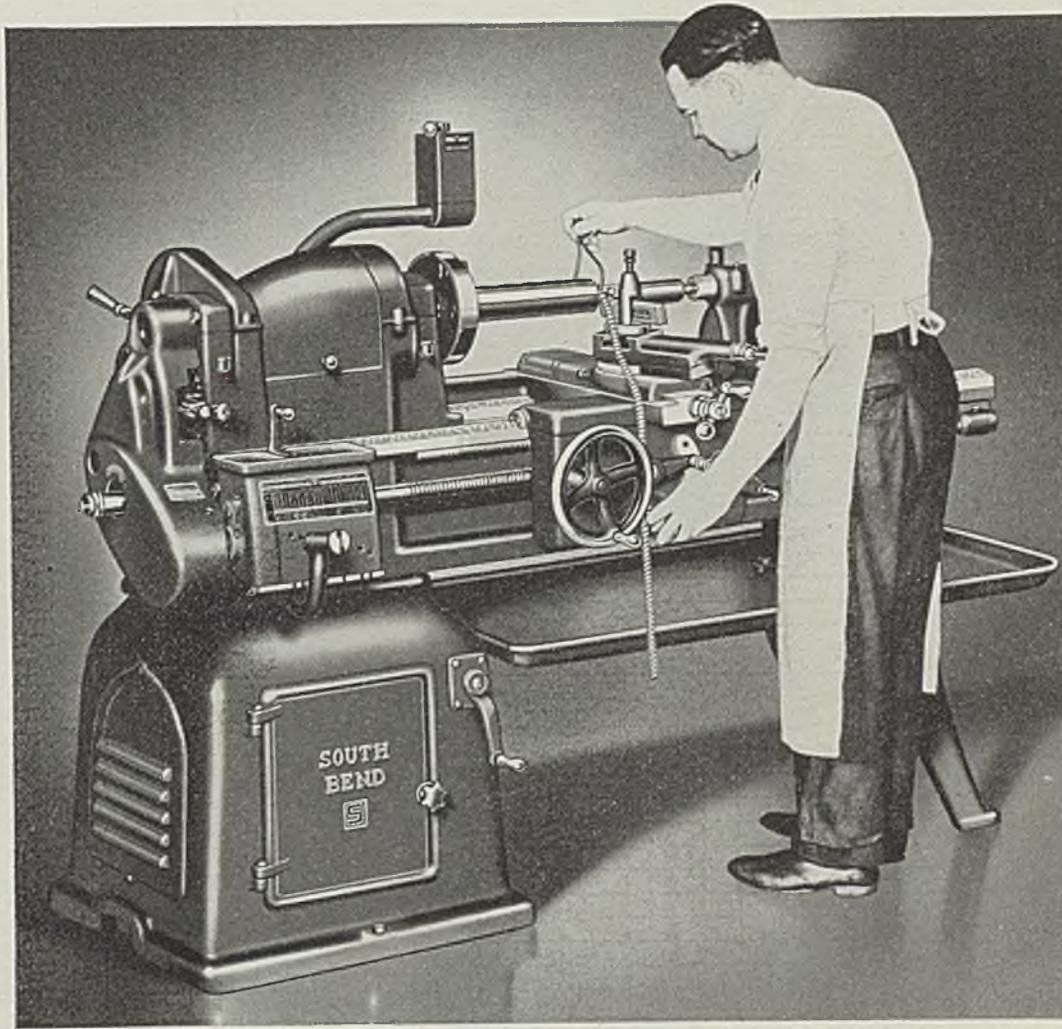
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MULTIPLE DISC CLUTCH. Cutaway view shows alternate keyed steel disc construction.



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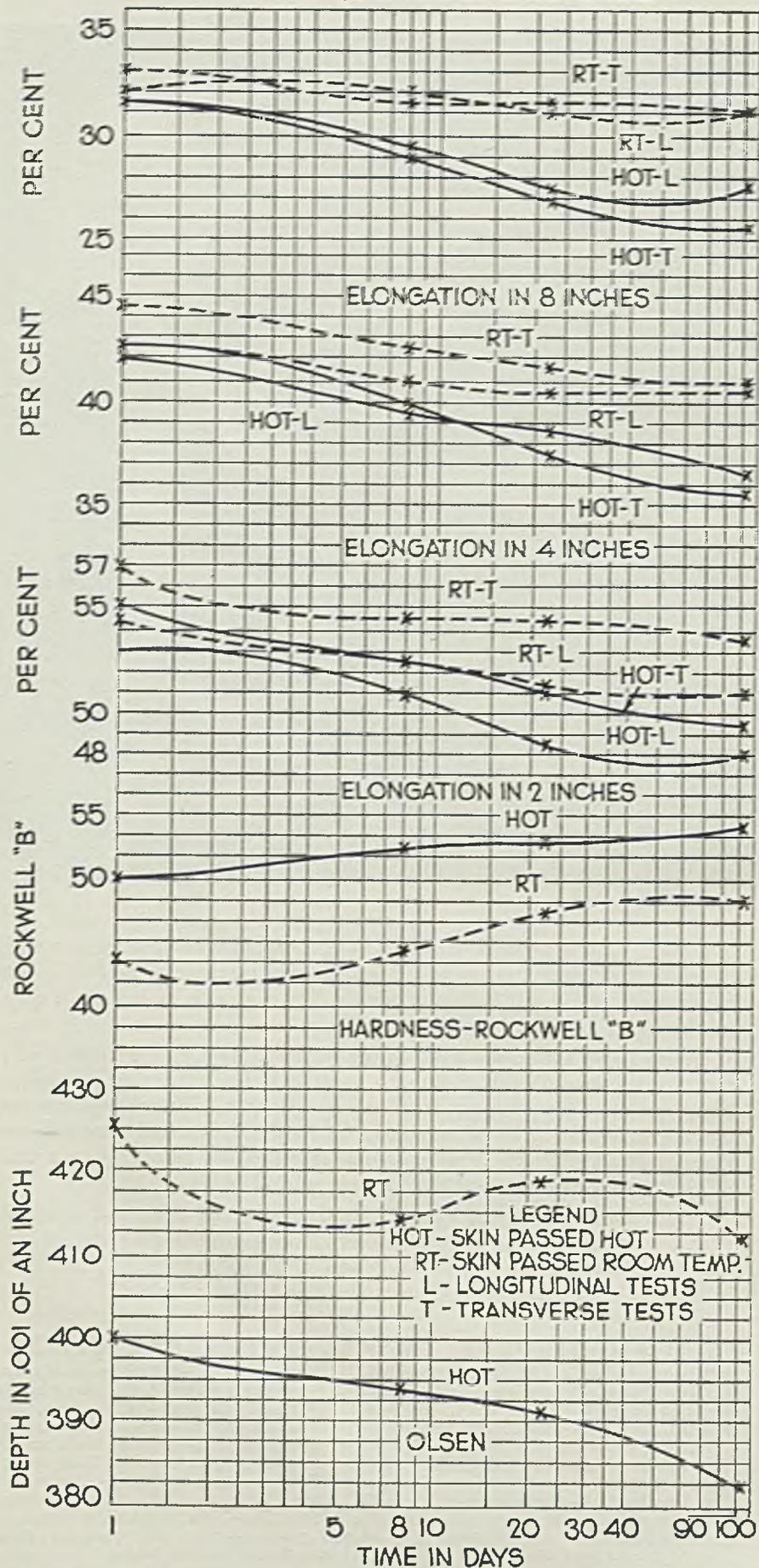
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EFFECT OF SKIN PASSES AT RM. TEMP. AND AT 150° F. ON THE DRAWING QUALITIES OF SHEET STEEL



final operation, it is argued that this cold work deformation causes the space lattice to become distorted and placed into an unstable condition and, therefore, it is not necessary that solid solutions be obtained in a supersaturated condition through quenching. This distorted space lattice behaves like a supersaturated solution. Increased hardness and loss of ductility after aging would be due to the distortion of the space lattice which rejects an iron-oxygen compound into the grain boundaries and slip bands. A slight amount of cold work is generally followed by more aging; severe amounts of cold work can be explained on the basis of "critical size" and agglomeration during cold work deformation with relatively little aging afterward.

This discussion is confined to cold reduced strip steel and strain aging only. The commonly known stretcher strains will be featured in another article on cold reduced strip but suffice it to say that the present practice of setting the strains by suitable skin or tempering passes and the usual procedure of breaker rolling before forming is practical.

Strain Aging Never an Issue

Aging of low-carbon cold-strip steel will be considered only from practical aspects and within the scope of the writers' experience with tonnage production. Allowing the present status of these contentions on aging it still remains imperative to observe conditions as they actually are; hence, we wish to propound a definite statement which in due course will be qualified. It is this: Within the whole scope of the author's experience with automobile sheet steel and cold reduced strip steel, strain aging has never been an issue. Being aware of the aging phenomenon it is obvious that some change takes place but with steel properly manufactured and processed within limits which permit practicable stability or equilibrium chemically and physically, the increase of hardness values with the inherent decrease of ductility is negligible to such extent that the production of a non-aging steel is not warranted irrespective of any extra cost of manufacturing.

Since the advent of cold reduced strip, the only increase in rockwell hardness has been generally three points, with a few cases of four points, except where the product was skin passed after the annealing at temperatures above room or atmospheric temperature and where hot strip bands of a carbon lower

Fig. 1—Graph showing various physical values

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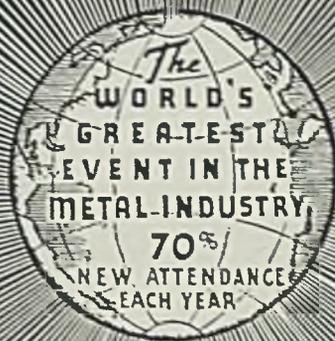


TABLE III—Quarter Panel Material Gaged Between 0.0335 and 0.035:

Rockwell B	Olsen, inches	Elastic limit, p.s.l.	Tensile strength, p.s.l.	Elongation			Performance	
				2"	4"	8"	good	broke
45-47	0.425	30,835	42,145	51.0	40.5	31.0	15	0
		31,450	42,590	55.0	42.0	32.0		
44-45	0.420	36,770	43,200	53.0	40.5	33.2	15	0
		37,985	44,320	56.0	42.0	32.7		
40-39	0.420	31,875	45,105	59.0	45.0	33.7	14	1
		31,445	44,520	54.0	45.0	35.5		
40-38	0.428	32,375	43,625	53.0	43.0	33.7	14	1
		32,335	43,195	58.0	44.0	33.0		
46-48	0.418	32,100	45,605	52.0	42.0	32.5	10	5
		33,355	46,910	52.0	41.0	31.0		
43-42	0.425	29,420	45,965	54.0	42.0	31.5	14	1
		30,500	45,875	57.0	45.0	32.5		
38-40	0.427	30,530	44,450	52.0	40.0	30.5	15	0
		30,080	45,325	53.0	39.0	29.5		
47-46	0.414	31,555	46,105	51.0	40.0	30.5	13	2
		32,427	47,290	55.5	42.5	32.5		
46-47	0.423	32,110	45,605	52.0	42.0	32.2	15	0
		33,355	46,910	52.0	41.0	31.0		
42-40	0.423	33,915	46,255	57.0	44.0	34.5	9	6
		32,235	45,660	54.0	42.0	34.0		

than that required to yield definite physical tensile values were cold reduced varying amounts to create false physical values. In this respective case the carbon was 0.12 and 0.14 per cent and aimed to artificially obtain an elastic limit of 42,000 pounds per square inch. This hot strip was held before final rolling so that the finishing temperature would be below the upper critical, again creating a critical strain within the material. In the case of plates the slab is held before the last several passes, thus permitting a drop in temperature thereby creating false physical values.

Physical values. Holding the hot strip between the roughing unit and the finishing train also promotes critical strain which creates an unbalanced equilibrium physically. This, however, yields two definite detrimental features: First, that of critical strain which influences a change both in physical values and of grain structure, and second, the respective steel cools from a subcritical temperature where the speed of cooling is of extreme importance. In both cases the changes of physical values continue to take place down to low temperatures and the same holds true with the grain size

change which continues to grow until temperatures, generally below 1200 and in some cases 1100 degrees Fahr., are reached when these changes are arrested, totally dependent of course on the extent and amount of critical strain. It is evident that this critical strain is solely dependent on any amount of stress or load applied at a critical strain temperature; that is, if light or greater loads were applied at temperatures above the upper critical this critical strain would not be present, whereas when light loads are applied at critical temperatures it will exist.

In considering aging encountered with skin passed strip while at room temperatures it was assumed that the steel would increase in hardness, decrease in ductility and also migrate toward embrittlement. For this purpose four lifts of a difficult "quarter panel" product were skin passed possessing some temperature. Each of the four lifts were of different open-hearth heats and constituted only the bottom slab of the ingots; four bottom slabs were obtained of each ingot, so segregation would be eliminated and analysis would be constant.

Physical values shown in Table I were determined immediately after skin passing. The double figures for the elastic limit, tensile strength and elongation represent both longitudinal and transverse directions.

Material having these physical values usually performs satisfactorily but in this case it was worked on the presses after 300 hours and it all broke 100 per cent even with extensive die adjustments except lift No. 4. Representative physical values are given in Table II.

This clearly indicates that the test pieces at time of skin passing were satisfactory but that the processing done while the steel contained temperature promoted aging. The values contained with heat

TABLE V TEST A)—Average Effect of Skin Passing Temperatures

Sheets, 20

Skin pass temp., °F.	Test	Rockwell scale B	Tested June 24		Elas. Limit, lbs./in. ²	Ult. Strength, lbs./in. ²	% Elong.		
			Olsen	Gage			2"	4"	8"
150-250	L*	49-51-51	0.400	0.039	36,100	45,200	53.0	42.0	31.5
	T†			0.039						57,200	45,700	55.0	42.5	31.5
70- 80	L	43-43-44	0.426	0.041	30,700	44,900	54.5	42.5	32.0
	T			0.041						30,800	45,300	57.0	44.5	33.0
Tested June 16 (22 days)									
150-250	L	52-53-54	0.391	0.039	39,000	46,200	48.5	38.5	27.5
	T			0.039						40,000	46,900	51.0	37.5	27.0
70- 80	L	47-48-48	0.419	0.041	32,500	45,300	51.5	40.5	31.0
	T			0.041						33,400	45,800	54.5	41.5	31.5

*Longitudinal. †Transverse.

TABLE IV-A—Sheets Attaining Rockwell, Olsen and Gage Values

Scale B	ROCKWELL				OLSEN				GAGE			
	Edge		Center		Edge		Value, inch					
	No.	%	No.	%	No.	%		No.	%	Inch	No.	%
45	1	0.50	...	...	...	...	...	...	...	...	...	...
46	...	...	...	...	...	...	...	...	...	...	...	...
47	3	1.66	...	...	...	...	...	...	...	...	...	...
48	2	1.11	...	...	...	...	...	...	...	...	...	...
49	...	...	...	...	...	...	...	...	...	...	...	...
50	1	0.50	2	1.11	7	3.90	0.350	2	1.11	...	...	...
51	2	1.11	5	2.70	1	0.50	0.055	6	3.34	...	...	...
52	8	4.40	1	0.50	2	1.11	0.060	15	8.40	...	...	...
53	3	1.66	4	2.20	2	1.11	0.065	23	12.80	0.034	2	1.11
54	10	5.51	8	4.40	1	0.50	0.070	29	16.20	0.035	15	8.40
55	16	8.95	12	6.70	14	7.80	0.075	29	16.20	0.036	54	30.00
56	33	18.40	18	10.00	29	16.20	0.080	23	12.80	0.037	48	26.80
57	32	17.90	36	20.00	45	25.00	0.085	10	5.51	0.038	14	7.80
58	25	14.00	42	23.50	38	21.20	0.090	7	3.90	0.039	19	10.60
59	32	17.90	34	19.00	28	15.60	0.095	10	5.51	0.040	14	7.80
60	9	5.00	13	7.30	10	5.51	0.400	13	7.30	0.041	4	2.20
61	2	1.11	4	2.20	2	1.11	0.005	8	4.40	0.042	5	2.77
							0.010	4	2.20	0.043	4	2.20
	179	99.21	179	99.61	179	99.54	....	179	99.67	....	179	99.68

No. 4 after aging show that they can be far inferior to the original and still do this difficult draw. Tests such as the after 300-hour values would not be passed for use.

Fifteen sheets of this number of lifts taken at random and represented by six different heats were processed at the presses about 30 to 40 hours after skin passing with some temperature. Physical values in Table III are representative at time of the pinch pass.

The last sample with six of 15 sheets broken was scrapped because of lamination. After standing for 108 hours this material was placed in production but a large quantity broke. Some of the sheets were salvaged and some scrapped.

From the various lifts 179 sheets were chosen at random. Tables IV-A and IV-B show the change in physical values and the frequency at which they occurred after aging. There is an increase in rockwell of 10 points, a gain in the elastic limit, a decrease in the elongation amounting to about 10 per cent, and a decrease in Olsen values of 15 to over 60 points.

Detrimental effects of skin pass-

TABLE IV-B—Tensile Tests

No. sheets tested		Elastic, lbs./in. ²	Ultimate, lbs./in. ²	% Elongation		
				2"	4"	8"
2	L*	37,635	47,320	49.0	36.0	27.5
	T†	37,480	47,275	47.0	36.0	24.0
50	L	38,027	46,995	47.0	35.5	24.0
	T	38,322	47,435	51.0	39.5	27.5
100	L	35,960	47,855	42.0	30.5	22.0
	T	41,967	49,225	45.0	32.5	24.5
150	L	41,745	49,190	44.0	31.5	24.0
	T	43,492	50,585	48.0	36.0	25.5
178	L	41,430	48,067	43.0	34.0	25.5
	T	43,535	49,082	48.0	36.5	26.2

*Longitudinal. †Transverse.

ing sheets while still hot after box annealing are shown in Table V (Test A). There is a definite increase in hardness accompanied by a lowering of ductility in sheets skin passed hot as compared with sheets allowed to cool to room temperature before skin passing. This variation is more apparent after the sheets have aged. The time required for the change to take place is approximately 70 hours, that is, the change takes place rapidly and is practically complete in 70 hours. After this period further change is

extremely slight. Furthermore, the increase in hardness and decrease in ductility is also accompanied with an embrittlement, the Olsen cup on aged material always develops a ragged fracture. Table V (Test B) shows the physical values obtained in cold reduced strip skin passed hot and cold, and then aged at room temperature for 22 and 92 days. All of these tests clearly show the detrimental effects upon the drawing quality of skin passing steel while hot.

(Continued Next Week)

Physical Properties and Aging Characteristics of 115 1/4 inches

Tested July 2, After Aging at Room Temperature									
Skin pass	Test	Rockwell scale B	Olsen	Gage	Elas. Limit, lbs./in. ²	Ult. Strength, lbs./in. ²	% Elong.		
							2"	4"	8"
1.72	L	51-53-54	0.394	0.039	34,200	42,500	51.0	39.5	29.5
	T			0.039	34,500	43,000	52.5	40.0	29.0
1.08	L	44-45-45	0.414	0.041	31,700	44,700	52.5	41.0	32.0
	T			0.041	32,300	45,500	54.5	42.5	31.5

(Test B)

Tested Sept. 23 (92 days)									
	Test	Rockwell scale B	Olsen	Gage	Elas. Limit, lbs./in. ²	Ult. Strength, lbs./in. ²	% Elong.		
							2"	4"	8"
	L	54-54-54	0.382	0.039	37,700	45,700	48.0	36.5	27.5
	T			0.039	27,900	46,400	49.5	35.5	25.5
	L	48-48-49	0.412	0.041	32,500	45,500	51.0	40.5	31.0
	T			0.041	33,000	45,700	53.5	41.0	31.0



Your product can carry the "EXTRA ADVANTAGE" LABEL of U·S·S Steel

WHY would the use of the U·S·S Quality Symbol offer you an "extra advantage?" Simply because it carries with it the prestige of the best-known name in steel. It supports your claims for the quality you put into your product. It is one more aid to consumer confidence.

Retailers, recognizing the influence of the wide national advertising for United States Steels, seize upon this label as an aid to selling, make it a primary point in their demonstration of product merit. Many are employing the seal in their own product advertising. It is a happy contribution towards meeting the increasing demand of

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Any qualified manufacturer using U·S·S Steels may employ this symbol without one cent of cost. Hundreds are doing so. In 1939 over 6,000,000 household, farm and office articles carrying this label were shown in retail stores and sold to the public. Evidence of successful merchandising results mounts daily.

Write for full particulars and information concerning the sixty classifications of products now benefiting from this remarkable promotion. Perhaps your products, too, could benefit.



**SPECIAL SEALS
FOR
SPECIAL STEELS**

The U-S-S trade-mark shown on this page is employed for the general line of steels. Other trade-marks are available for STAINLESS, COR-TEN, MAN-TEN, VITRENAMEL, PREMIER SPRING WIRE, FENCE, etc. Many manufacturers have even incorporated the U-S-S mark into their own label. Special cooperation assured to meet your own product's requirements.

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AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
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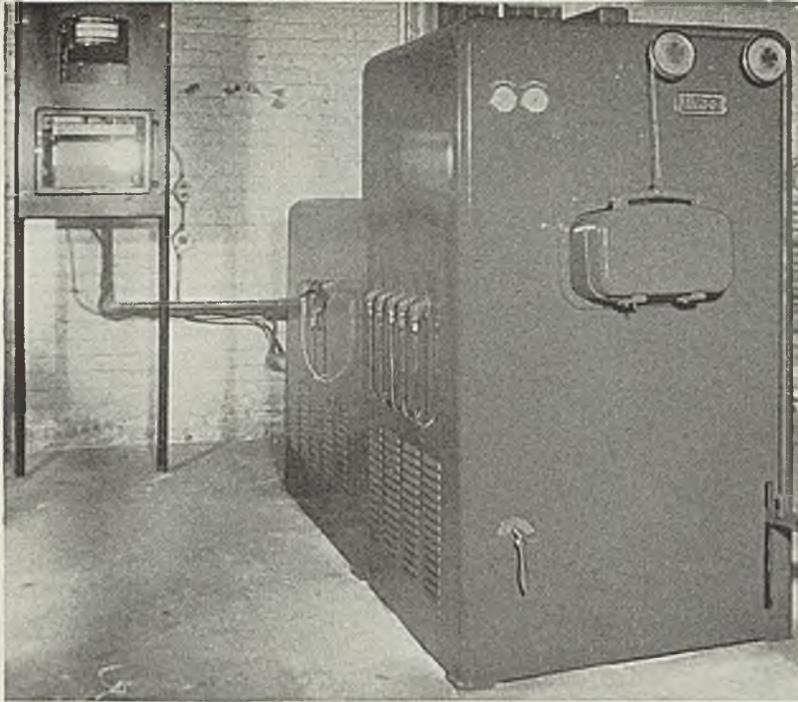


Fig. 1—Typical lithium-atmosphere furnace and controller

Lithium Atmospheres

Furnace atmospheres containing lithium absorb all oxygen released from water vapors, etc. Work leaves furnace with same surface as it enters. No adjustments necessary for various steel analyses

■ A NEW METHOD for heating steel and nonferrous alloys has been perfected recently by the Lithium Corp., 1180 Raymond boulevard, Newark, N. J. It is based on the use of lithium as a neutralizing medium for furnace atmospheres but does not involve any basic changes in heat-treating practice.

Lithium has a greater affinity for oxygen (50 times more than iron or carbon) than has any other element with the result that a furnace atmosphere containing lithium will absorb any oxygen released from water vapors, carbon dioxide, carbon monoxide, moisture-bearing hydrogen or nitrogen or occluded oxygen and water.

The process claims as its principal merit the fact that the material treated leaves the furnace with the same surface analysis as when

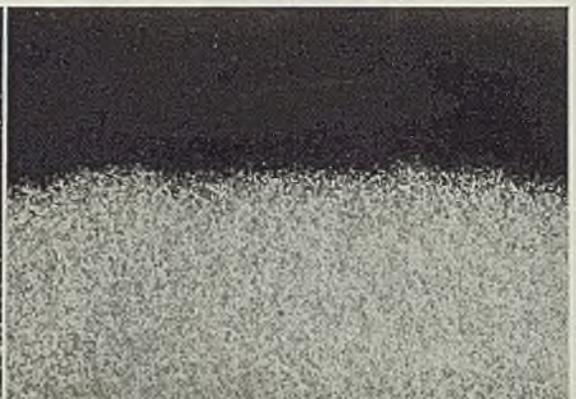
placed in it. This means that carburization, decarburization and scaling are entirely eliminated. No adjustments are necessary as various analyses of carbon or alloy steels (for instance a steel with 0.10 per cent carbon and another of 1.4 per cent) can be heated simultaneously without affecting the carbon content of either.

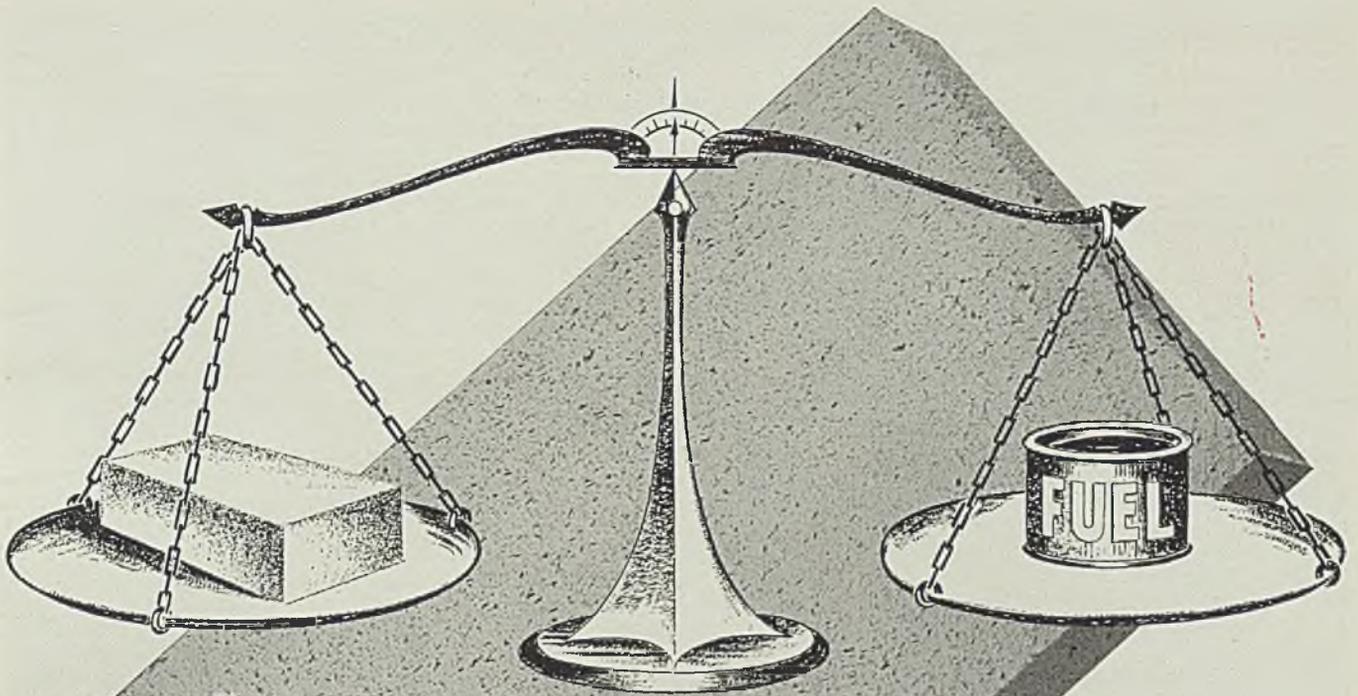
A slight staining takes place in the outside air after the material is removed from the furnace. This can be overcome and the work brought out bright by quenching di-

rectly from the furnace atmosphere in oil, water or brine. Materials requiring air-cooling, such as air-quenched die steels, are given a protective coating of lithium by stepping up the proportion of this element in the furnace atmosphere. This adjustment is made through an indicating controller pyrometer. This coating can be quickly removed from the work as brought from the furnace, leaving the bright undersurface of the steel itself without any loss of weight.

The process may be explained further by describing the furnace shown in accompanying illustrations. This unit is 42 inches wide, 94 inches long, 64 inches high and has a capacity of 100 pounds per hour. The process is also adapted to continuous conveyor and other types of furnaces. Furnace atmosphere is provided

Fig. 2. (Left)—This SAE 3312 steel was fully carburized, then heated for an hour at 1500 degrees Fahr. in lithium atmosphere. No decarburization resulted. Fig. 3. (Right)—Similar test of chromium-vanadium valve spring steel. No decarburization





Lighter Weight

Less Fuel

There is one simple guide to the ability of an insulating firebrick to effect maximum fuel savings in an industrial furnace—weight. The lighter the weight the less fuel will be burned; the greater the weight the greater the fuel consumption. This is because insulating value and heat-storage capacity, which affect fuel consumption, are related to weight.

In their respective temperature ranges B&W Insulating Firebrick are the lightest in weight—hence represent the greatest potential fuel savings. The K-16, weighing but 1.1 lb. per 9-inch straight, is over 90 per cent air in the form of tiny, uniformly distributed cells. Others in the B&W series have similarly low weight and corresponding high index of fuel savings.

Details gladly supplied upon request.

The Babcock & Wilcox Company

Refractories Division

85 Liberty St., New York, N. Y.

R-116

B&W INSULATING CONCRETE

B&W Concrete Mix is a light-weight castable with high insulating qualities and strength. It is ideal for cast or rammed furnace foundations, car top insulation, door linings, and similar uses, either exposed to furnace gases or as backing-up insulation. It may be reinforced in the same manner as ordinary concrete.

Two grades are available: B&W K-20 for 2000 F operating temperature and B&W K-22 for 2200 F.

BABCOCK & WILCOX

by burning the usual commercial gas from city mains and deflecting the spent gases through a simple evaporating chamber containing the lithium cartridge or cup and then on to muffle where the work is being treated and finally out through a vent in the top of the furnace. This vent also serves as an excellent tell-tale, indicating proper furnace operation since lithium burns with a bright scarlet flame. The cartridge, costing \$1.25, is sufficient for operating the furnace about eight hours with a safety factor of two hours, and may be replaced by removing the cover at the top of the generator.

Burned gas from the single burner reaches the muffle at a temperature of about 1200 degrees Fahr. The evaporator is heated externally by another single burner, indicator controlled. The rate of evaporation of the lithium compound can be adjusted by changing the controller setting.

The muffle itself is 12 inches wide, 36 inches deep, 6 inches high and is heated by a set of five burners on each side, each set controlled by a potentiometer recorder. A system

of recirculating tubes provides uniform heat distribution. The thermocouple for the potentiometer is fitted into a well in the top of the muffle so the inside temperature of the muffle is controlled rather than that of the outside muffle wall. Temperature variation, front to back, top to bottom, is less than 1.5 degrees Fahr.

Temperature range of this equipment is 1200 to 2400 degrees Fahr. Any temperature within this range required by the work in process may be held by setting the potentiometer controller. Although the prepared atmosphere enters the furnace at 1200 degrees Fahr., it is brought up to operating temperature within an inch from the point of entrance.

Gas consumption is comparatively low. Using 550-B.t.u. gas, tests show that 440 cubic feet are required to bring the furnace up to 1450 degrees Fahr. after a week-end shutdown. This is accomplished in 1 hour and 40 minutes. About 100 cubic feet per hour are required to hold the furnace at 1450 degrees Fahr., either with or without a load.

Seventy-six cubic feet are needed

to treat a 50-pound load at 1450 degrees Fahr., based on 15 minutes for bringing it up to proper temperature and another 15 minutes for soaking.

As an additional indication of fuel consumption, 9 minutes and 38 cubic feet of gas are necessary to raise the temperature from 1450 to 1550 degrees Fahr. About 110 cubic feet per hour are used in holding at 1550 degrees Fahr.

A chromium-nickel-molybdenum axle-steel test piece weighing 1 pound 6½ ounces and held in the furnace at 1500 degrees Fahr. for 25 minutes showed no oxidation after being air-cooled and gained less than 1/10 gram in weight. Test pieces, including both steels and beryllium copper, retained their original bright appearance on being quenched in oil without being exposed to the atmosphere.

The lithium process also is suited for melting alloys in crucibles, such as certain brasses, bronzes, aluminum and copper since drossing is eliminated. Too, it is advantageous for heating prior to forging and pressing.

Handling Waste Material Effectively

■ Handling waste metal resulting from processing parts in the machine shop often proves to be a "headache" in many plants. One manufacturing concern handling tin plate scrap solved this problem adequately by reclaiming the tin in a heating furnace, running the black

plate through a shredder and finally pressing it into bales about 18 x 15 inches in order to reship it to the open-hearth plants for reuse.

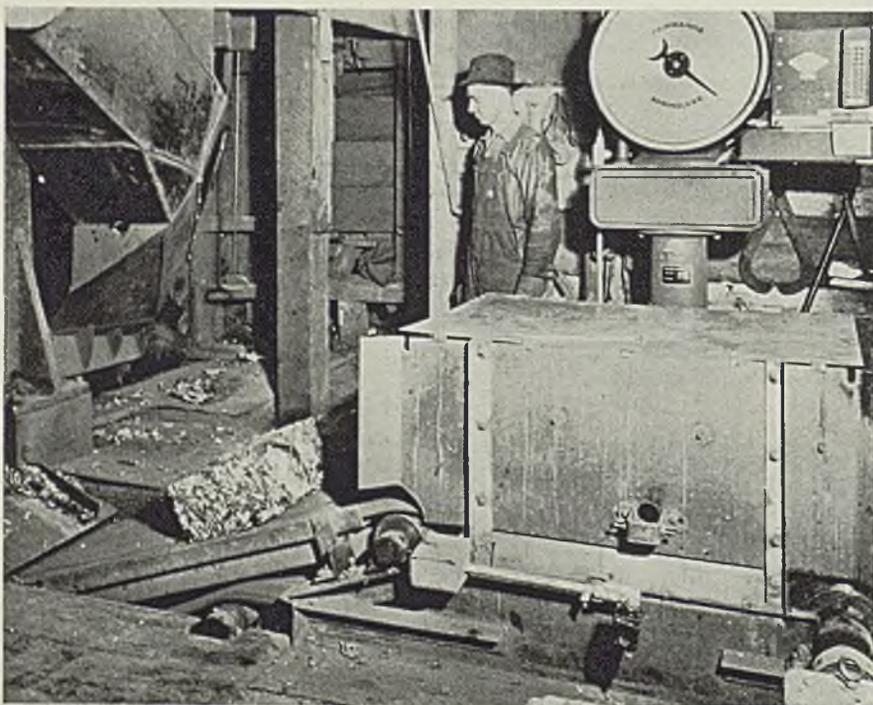
In handling the material, it is important each bale is weighed quickly and accurately as the operators are paid on a tonnage basis. This

is done by utilizing an electric-eye-operated dial scale equipped with a printer.

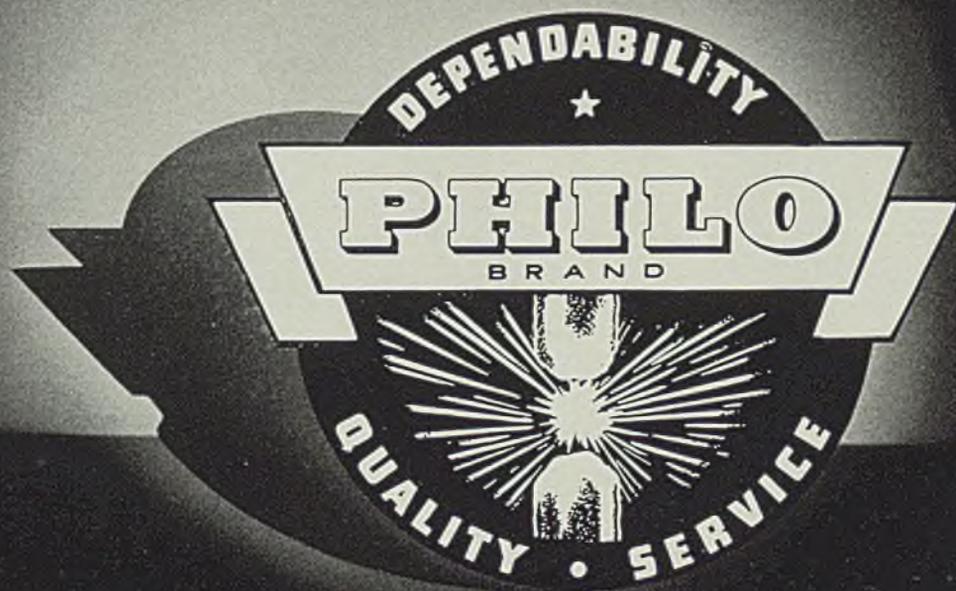
As the illustration shows, a dial scale equipped with a chart and graduated to 500 pounds is used. The scale is equipped with a Printomatic with time clock, one bank of letters, one bank of numbers and one bank of special symbols. The printer attachment includes a double roll tape. Mounted on the scale platform is a section of roller conveyor by means of which an endless belt, 9 feet long and 36 inches wide, passes over the scale platform and underneath the scale box. Speed of the belt is approximately 12 feet per minute.

As the bale comes from the press and drops onto the moving belt, it is carried across the scale platform. At the instant the bale passes over the center of the platform, it intercepts the beam from the photo-electric cell. This, in turn, trips the printing mechanism automatically and prints the weight.

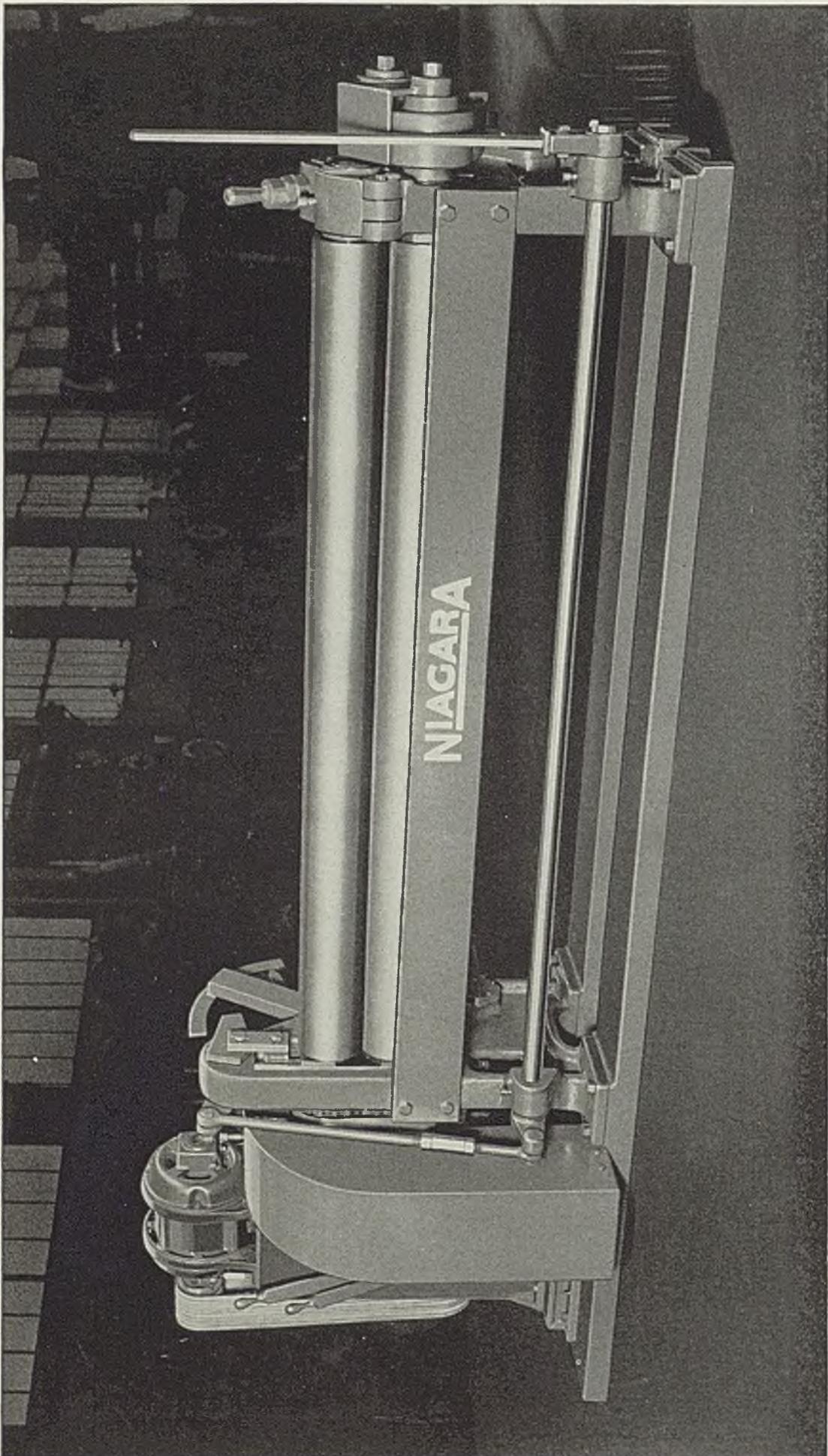
The scale is set to weigh a bale of scrap metal about every 20 seconds. As shown, the housing over the scale platform is closed on two sides and at the top. This is to prevent shadows of the workmen who pass by from tripping the electric eye. Photo courtesy Fairbanks Morse & Co., 600 South Michigan avenue, Chicago.



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of Proven Quality"



Ohio Ferro-Alloys Corporation
Canton, Ohio



Niagara Heavy Slip Roll Forming Machines are used in the manufacture of boilers, oil storage tanks, underground gasoline tanks, truck and car tanks, drums, smoke stacks, ventilating pipe, casket tops, and other work involving the bending of sheets or plates to a cylindrical cross section.

The sizes range up to 7½ inches in roll diameters and from 3 to 10 feet working lengths of rolls.

Write for Bulletin 77-B giving data on the complete line. Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo, N. Y. Branches: Cleveland, Detroit, New York.

—ADVT.

Rolling Mill Equipment Reclaimed by Welding

Roll pods and other mill parts which undergo severe pounding and wear in service are reconditioned by application of hard facing material at appreciable saving in maintenance costs

■ RECLAIMING or replacing the wear on steel mill rolling equipment such as spindles, crabs and coupling boxes has always been a problem of major proportion. Replacement cost of the parts would justify the necessary expenditures for reclamation if the equivalent to original wear were obtained. When increased service life is secured from the built-up part, an appreciable saving of maintenance man-hours and an increased production are accomplished.

Spindles, crabs and coupling boxes, acting as the means of power transmission between the engines or motors and the rolls, are subjected to extremely severe service. On a continuous type mill the pounding results in wear on one side of the pods only, while on the reversing mill both sides of the pods are active, and the effect is, therefore, doubly pronounced. The efficiency

By D. B. RICE

Welding Engineer
American Manganese Steel Division,
American Brake Shoe & Foundry Co.
Chicago Heights, Ill.

of the mill is reduced materially by wear at these points and frequent replacement is required either with new material or reclaimed parts to maintain the equipment within practical limits. Improper maintenance of separators or stretcher blocks often causes excessive wear which would ordinarily result in scrapping of the part as being too badly worn for reasonable reclamation. However, by the use of suitable welding materials for the purpose, even badly worn pieces can be reclaimed with the assurance that the additional service to be obtained will offset the expense and

actual profit will be derived from it.

The following procedure, developed in one of the larger eastern steel plants, has resulted in several times the service to be obtained from new parts.

A number of analyses of steel are used for spindles and crabs. Predominant in this field, however, are carbon steels ranging from 0.45 to 55 per cent carbon and the usual 12 to 14 per cent manganese, or Hadfield steel.

It is sometimes necessary to replace as much as 1½ inches of worn-away material on the sides of the pods and under such conditions there is some variation of materials used if the parts are of 0.45 to 55 per cent carbon steel. Considering this type of steel first, all spalled

(Please turn to Page 66)

Fig. 1—Sketch of roll pod showing groove provided at the back to allow for any stretch or flow of weld metal and thus prevent spalling in service

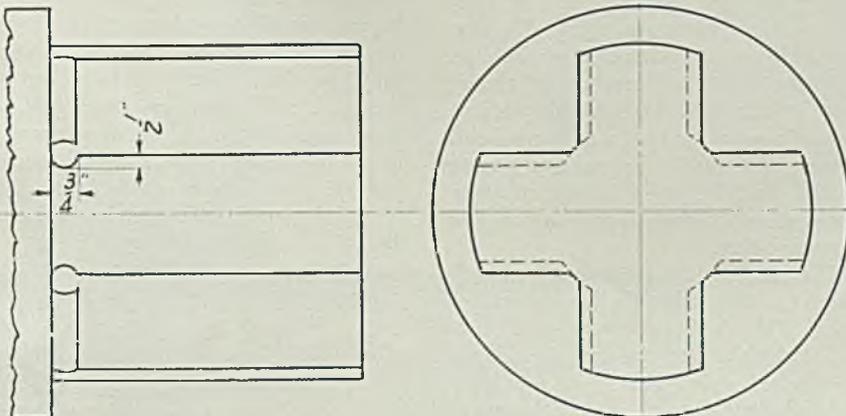
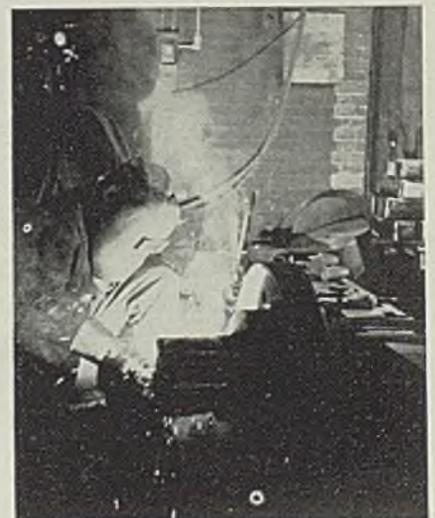


Fig. 2—Spindle or crab being reclaimed by the application of hard facing metal



BETWEEN HEATS

WITH *Shorty*



■ Say Fellers:

Didja ever get the foremen at your plant to come over in the boss' office and put their legs under his table? Didja ever listen to 'em chinnin' with each other 'bout everything under the sun 'n then start talkin' 'bout what they're doin' in their departments?

Didja ever hear your boss speakin' to one of your fellers and sayin', "Your doin' some nice work over in your place, Sam ol' kid, I'm not apple-polishin' when I'm tellin' you I like the way your doin' things?"

Didja ever hear him ask one of the boys, "How 's tricks at home, son? How's the Mrs. and the kiddies? How's the fish bitin' or how 's the garden comin' along?"

You know how y' feel when the boss sez some of these things to you, don't you? Well, sir, these fellers feel the same way.

The other day the boss patted Happy Farr, the straw boss of the labor gang, on the back. The fellers call 'im Happy 'cause he 's always hummin' a tune or smilin' atcha when y' meet 'im 'round the plant. 'N he 's like that with his men, too.

"Hap" isn't like a boss I used to work for. Cy Cox was his name. Cy decided he was goin' to get more work out of his men so he posted a notice that no one was to smoke cigarettes while on duty.

The boys comin' into the plant through the clock house stopped at the bulletin board and read the notice. "More blaw-blaw from old bossy that 's goin' to get 'im in a —ll of a lot a trouble," you'd hear 'em say. Course they sez a lot more but y' gotta work in the mill to understand what it was all 'bout.

One mornin' ol' bossy Cox, as we used to call 'im, was taking a short cut through the blacksmith shop on his way over to the office. Jus' as he pushed open the door leadin' out into the yard, he meets Tony Stucco who makes up the bottoms for the bessemer converters. Tony had a cigarette in his right hand and seein' bossy Cox, he closed his fingers around it as best he could and sez, "mornin', Mister Cox."

Quick as a wink ol' bossy grabs

Tony's hand and closed it on the lighted cigarette and held it for a second or so. Tony jerked away 'n freed himself, said a few words in his own language 'n started for the laboratory for some picric acid to put on his hand to relieve the pain. The incident got 'round the plant 'n not long afterward if y' looked close 'nough you'd see a couple of good-sized hunks of limestone up on the platform where they keep a supply of ma'ganese for chargin' into the bessemer vessels.

Whaddaya suppose they were doin' with 'limestone up on the chargin' platform at the bessemers?

Layin' for the Boss

Well, fellers, I'll tell y'. We had a grapevine in the mill same as they have in every other plant 'n when Tony's story got noised 'round as how 'ol bossy burned his hand, well they sez—sometimes ol' bossy comes nosin' 'round the bessemers. 'N so some good size pieces of stone somehow and s o m e w a y got into the skip and found their way to the chargin' bins.

But you know, fellers, somehow that limestone never dropped off the chargin' platform at the bessemers. The boys put it in the skip and send 'er down to the loadin' station, back where she came from. "How's come?" —Well, I'll tell y'.

One day bossy sez to the bricklayer foreman: "Charlie, y' know I'd give anything if I had the respect of the men 'round the plant as y' have."

Well fellers, Charlie laid ol' bossy out colder than the stockyard in wintertime right there and then. He sez: "Trouble with y', boss, is you're like a pepper shaker. Y' say cuttin' things that irritate and provoke the fellers 'round the mill. Didja ever try bein' agreeable? Don't be so harsh and cocky. Put a jar of honey in your workin' pants and throw away the pepper shaker.

The boss' face turned fiery red and he sez: "Man what the h—l y' talkin' 'bout. Think I got no sense?"

"Boss, y' begged the question. Now let me set y' straight. Trouble with y' is y' live in a darkened doorway. Why don't y' take a ship and get away

from unpleasant things like a bad temper, grumpiness, cuttin' remarks and tricks like closin' a man's hand on a lighted cigarette—jus' to get away from disagreeable people like yourself?

"So you're talkin' 'gainst me, huh Charlie? Alright. Alright," sez the boss as he turned to go. But y' know, fellers, Charlie wasn't through and he starts chinin' agin.

"There is many a crew 'round the mill which works out of sight, or performs tasks that attract little of your attention. Firin' boilers is out of sight, but if the steam pressure falls!—well you're sure to jack 'em up over at the boiler house. Getting ore to the top of the furnace is out of sight, but if the little skip car stops runnin' you're the first over in the stockhouse jumpin' on the boys runnin' the larry car. Puttin' a linin' in the open he'rths is out of sight but if y' don't see the stacks spittin' fumes y' want to know what the h—ls the matter.

"Why don't y' go over in the boiler-house, or down in the stockhouse, or over on the open-hearth chargin' floor once in a while and chin with the fellers? They only have bare arms and flannels, they change turns through day and night. While we eat and sleep they're toilin' to keep up our 100 pounds steam pressure and to keep the furnaces makin' iron and steel. You travel 'round the plant and never see these men. Why don't y' catch a sunbeam and toss it into the lap of some of the fellers workin' for y'?"

"Mebbe you're right, Charlie," the boss sez.

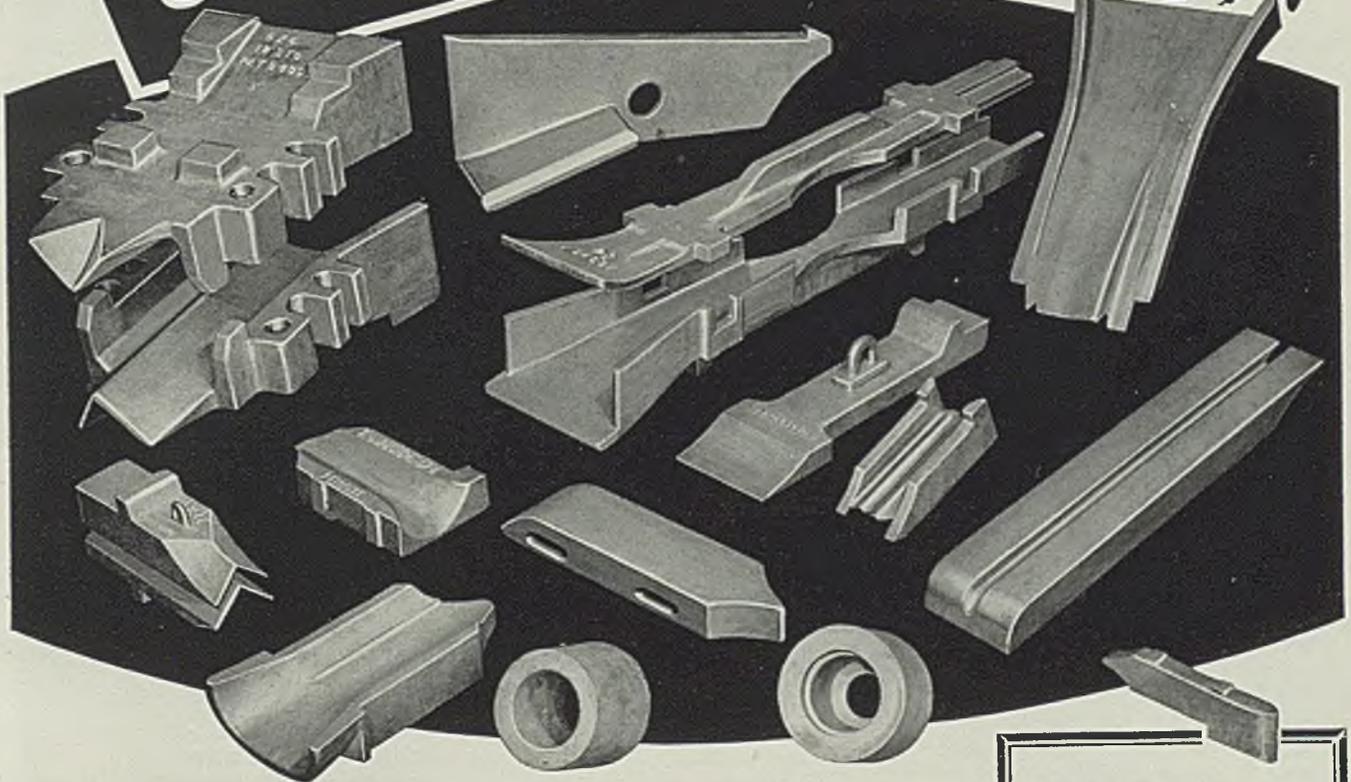
"Sure, I'm right. Try puttin' a grin on your face once in a while, why don't y'. A smile can win where a scowl is sure to lose. You've got some good stuff in y'. Don't bottle it up.

Let me tell y' fellers what happened then—I gotta get back over to the bar mills. The boss did catch 'imself jus' as Charlie told 'im. The men 'round the mill sensed the change. The grapevine started buzzin' 'n 'fore long the boys made ol' bossy head of the Foremen's club. The men would do anything for 'im. The "big boys" up at the front office gave 'im a pushup not long ago. Today he 's sittin' pretty in the top ranks. 'N if I do say it myself, ol' bossy is one of the best liked operatin' guys in the steel business today.

Well so-long, fellers. Hope y' rub shoulders with ol' bossy some day.

"Shorty" Long

How to get your
'goddam' yield up!



Do it with **TRANTINYL**
—“ups” tonnage—“downs” scrap

“Ten times the wear”—“Turn after turn untouched”—“No pickup or scratch”—“Unbelievable tonnage and low scrap”. These enthusiastic comments come from hard boiled operating men who have already proved Trantynyl's outstanding merits. At first skeptics, now they say, “The mills ought to beg you for your stuff”.

—“We used to change guides several times a turn, now they stay in for weeks”.

The answer to such life and tonnage is in the right choice of over 22 alloy steel analyses plus correct processing and heat treating. But, what do you care how it is made if it does *your* job? As proof we'll submit statements and experience of others (where permitted). One thing is sure, once you try Trantynyl guides you'll never switch. How to be happy and keep “Mahogany Row” happy too—lower your costs,—improve your quality and simultaneously boost your tonnage with Trantynyl. It should sell by the ounce but is priced by the pound.

BACKED BY 24 YEARS FOUNDRY METALLURGICAL EXPERIENCE



**OTHER TRANTINYL
TONNAGE RECORD
BREAKERS**

Seamless Tube: Guide Shoes, Rolling Mill Plugs, Stripper Guides. Bar Mills: Guides, Rollers. Hoop Mills: Guides, Feed Rollers. Billet Mills: Rollers, Guides. Strip Mills: Guides. Uncoiler Wearing Plates (Cold Strip). Shape Mills: Rollers, Guides. Welded Pipe: Rolls.

Also—Conveyor Rollers, Tool Holders, Bolsters, Spindles, Rollers for Roller Guides.

Elimination of machine work by precision casting methods.

YOUNGSTOWN ALLOY CASTING CORPORATION
Youngstown, Ohio, U.S.A.



Machine Transfer Method

Special hanger with locking pin permits low-level lift truck with flat U-platform to lift and move heavy bulky machines. Load placed solidly on floor. No crane or lift platform needed

■ WHILE increased production with the accompanying demand for greater speed in handling or greater storage capacity in limited space probably accounts for most materials handling advances, many developments come from an effort to solve a particular problem of transfer. In some instances, these special applications when worked out successfully are found to be adaptable to broad general usage.

Such is the case as regards the rather unique method of handling finished machine tools originally developed to accommodate the moving of heavy machines in a machine tool demonstration room included in a new office building of the Leland-Gifford Co. As this building is strictly office type construction, there is no space available for overhead cranes or other conventional means of transferring heavy loads. While the use of skid platforms and lift trucks is feasible, this would have left the machine being demonstrated several inches above floor level and so would destroy the effectiveness of any demonstration illustrating ease of handling and accessibility of the machine.

Requirements for this original transfer system included the ability to pick up a machine of maximum weight of 6000 pounds, small vertical lift so high machines could enter the room, ability to maneuver easily so machines could be arranged suitably, ability to pick up a machine from a storage floor and deposit it solidly on the demonstration floor in the desired location leaving no skid, bars or platform under the machine.

Study revealed that a U-shaped lift truck of 6000 pounds capacity with customary methods of raising and lowering the upper surfaces would be satisfactory. From the accompanying illustrations it will be

By A. L. WILKINSON

Leland-Gifford Co.
1001 Southbridge Street
Worcester, Mass

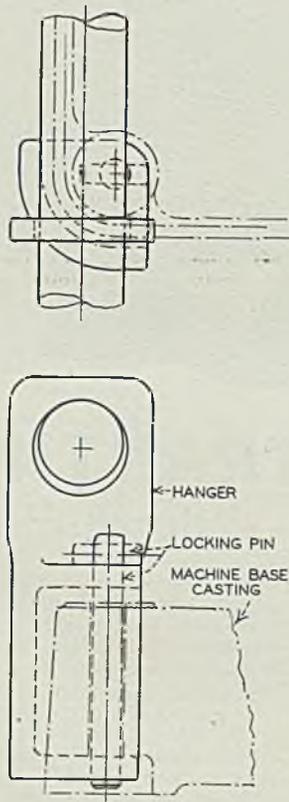


Fig. 1—Diagram of special hanger with locking pin in place on machine base ready to lift

noted that the entire U-shape top or lifting surface moves as a unit—the usual three-point method of support being retained to secure maxi-

From paper presented at May, 1940, meeting of American Society of Mechanical Engineers at Worcester, Mass.

mum maneuverability. The rather unique method of suspending the machine which was adapted to this type of truck illustrates a general system that may have many applications.

It only needed development of easily applied holding devices that could be utilized as standard practice in the storage of machines to make this transfer method have wide application possibilities. The method is applicable to moving in and out of storage heavy irregular objects which ordinarily would involve the use of overhead cranes or objects normally handled on lift platforms and transferred with conventional trucks.

Use of overhead cranes necessarily limits the available space to the floor area covered by the cranes. It also eliminates buildings whose construction will not lend itself to crane installation. In times of high production, storage of finished machines may occupy much valuable floor space and crane facilities that could well be put to use in productive activity.

While the other alternative—the use of lift platforms—offers more flexibility, relatively heavy and expensive platforms must be tied up with each machine where any considerable weight is involved. Also, a machine with a relatively high center of gravity leaves much to be desired when mounted on the usual platform and lifted with ordinary lift trucks.

The problem thus resolves itself into designing devices that could be applied easily to the corners of machine bases and yet be rugged enough to accommodate safely the heaviest machines when lifting them with the U-truck. Also it is necessary that the device raise the base from the floor only an inch or so. This affords safety in case of mate-

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rial failure and provides stability during transfer. Several designs were developed, finally resulting in the simple, rugged attachment shown.

The clamp or hanger in Fig. 1 is placed on the corner of the machine base. The bottom shelf slips into a recess in the corner of this base casting. A rod is slipped down through the upper hanger plate, through the hole in the base of the machine and projects through into the lower hanger shelf.

Fig. 1 shows the hanger and lock-

ing pin in place, with lower hanger shelf inserted in a cored recess in the corner of the machine base. The locking pin has been dropped into place through the upper hanger flange, cored hole in the base, and through the lower hanger shelf. Loose fits on all parts add to the ease of attaching and detaching the lifting devices. The vertical plate of the hanger contains a hole large enough to accommodate a bar or pipe of sufficient strength to hold the desired load. These projecting bars provide the means whereby the

U-truck is enabled to lift the load. The hangers are easily or quickly placed or removed without the use of nut, bolt or clamping devices.

The method also can be adapted to machine bases that have no special provision for the hanger. While some of the advantages of speed and flexibility are lost, an effective method is to place a small rectangular plate, with a tapped hole, directly under each corner of the base. The tapped hole is lined up with the hole in the base normally used for lag screws. A threaded eye-bolt then can be screwed to the plate and the procedure described above then followed. The small attachment plates are then left under the machine while it is in storage.

The ease with which this method can be used is illustrated by Fig. 2 which shows how one man can perform the entire function of a machine transfer. All the work of preparing the machine as well as moving and removing the lifting fixtures can be performed by one man except for unusually heavy machines which may require additional help.

Machine Supported on Wide Base

The forks of the lift truck are run each side of the machine and bars or pipes slipped through the holes of the hangers. Then the U-platform is raised sufficiently to lift the machine just far enough to clear normal floor irregularity. The machine then is ready for transfer to any location that has clearance around the machine and sufficient floor strength to carry the weight.

The center of gravity of the machine is raised only a fraction of an inch and the points of support are outside the machine base as shown in Fig. 3. This gives a wide base of support and excellent stability which is so highly desired in moving many heavy bulky machines.

To lower the machine into place, the truck section is merely lowered, the bars withdrawn and the hanger fixtures removed. The machine is now ready for use or else is in place for storage.

The advantage of this method in storing machines is obvious from Fig. 4 which shows a second machine being brought into place along-

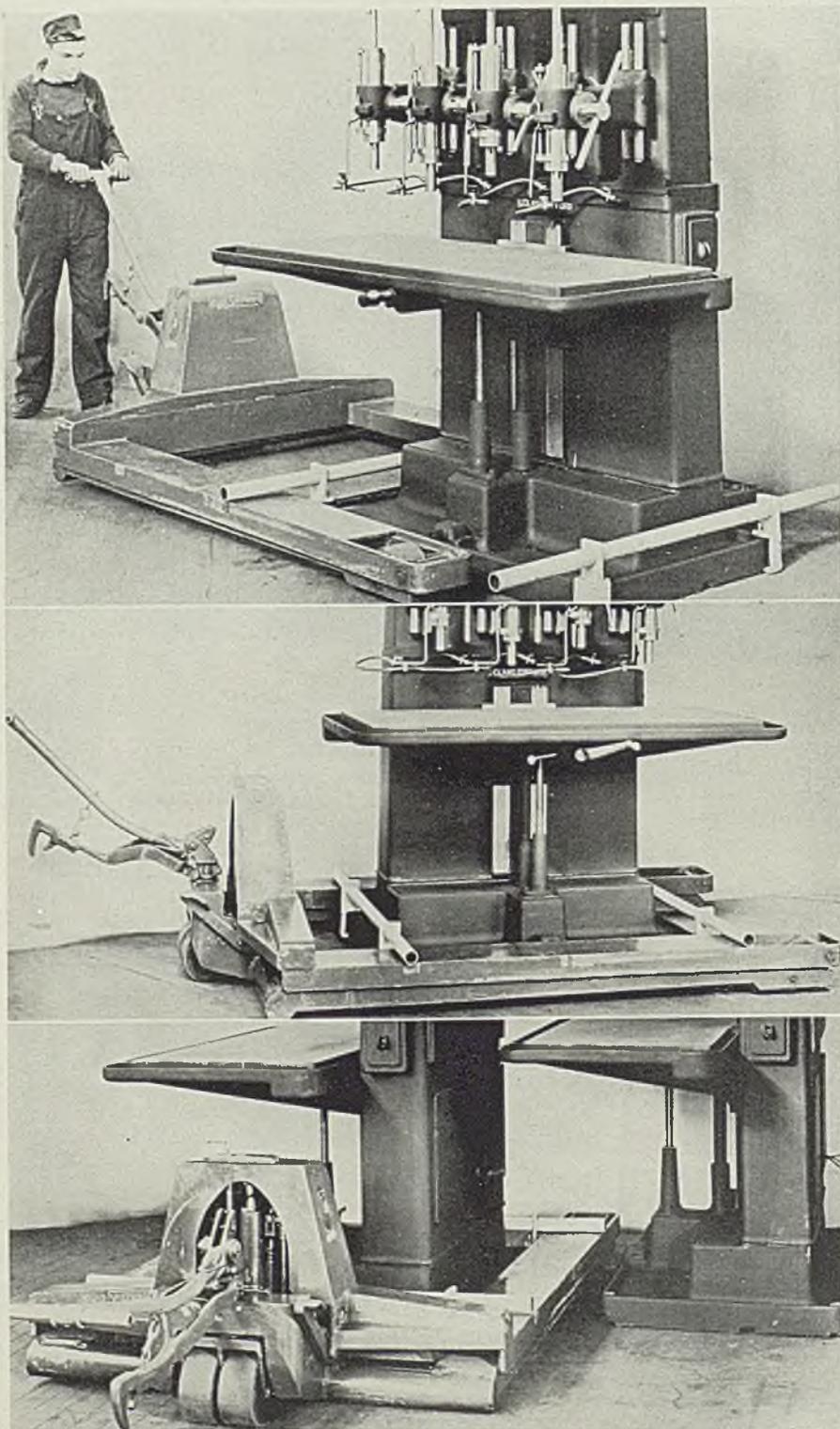


Fig. 2. (Top)— Lift truck being brought into position. Hangers and crossbars are already in place, ready for lifting the machine

Fig. 3—Here the machine has been lifted from the floor and is ready to be moved

Fig. 4. (Bottom)—In storing machines, note here that clearances of only a fraction of an inch are sufficient with no danger of damage to stationary or moving units

side one already in position. Clearances are small. No crane or lift platforms are used. The method provides a neat compact arrangement in space that formerly would not be available for storage. All storage aims at leaving a minimum of unoccupied space, and Fig. 4 illustrates how close the machines can be placed by this method. Even with minimum clearances, there is slight possibility of damage to machines already in place or to the machine being stored.

Safety of the method is everything that would be desired as the machine is either resting firmly on the floor or else is rigidly supported a fraction of an inch above the floor during all phases of transfer.

No doubt builders of heavy machines will be quick to see how this method can be applied in their own plant. While the above review necessarily is confined to one type of machine, it is an easy matter to introduce any variations that may be required to fit the method so a wide variety of other loads can be handled.

Issues Third Bulletin On Phosphorus

■ Bulletin No. 3 entitled "Phosphorus-Iron Alloys" has been published by the Phosphate division, Monsanto Chemical Co., 1700 South Second street, St. Louis. It is divided into two parts, the first of which deals with United States patents relating to phosphorus as an alloying element. The second part embodies a list of United States patents relating to steel production and treatment.

Introduces Tubing For Severe Service

■ B. F. Goodrich Co., Akron, O., announces a new Koroseal tubing designed for rigorous, specialized services. It is made without fabric or any other wall reinforcement. The hose shows durometer hardness 70 to 78 at 85 degrees Fahr.; specific gravity, 1/31; working pressure 50 pounds at temperatures up to 120 degrees Fahr. Recommended working pressure of 50 pounds per square inch is based on a safety factor of 5. It is free from sulfur, and can be attached to brass, silver, etc., without corrosion of the metal.

The tubing does not swell in oil or other solvents of rubber, and is not affected by strong corrosives. It is stocked in inside diameters ranging from 1/8-inch to 1/2-inch and 1/16 to 1/8-inch wall thickness.

Among the uses for the new hose are installations in chemical laboratories and plants, as slip-on coverings for plating rack insulation, in

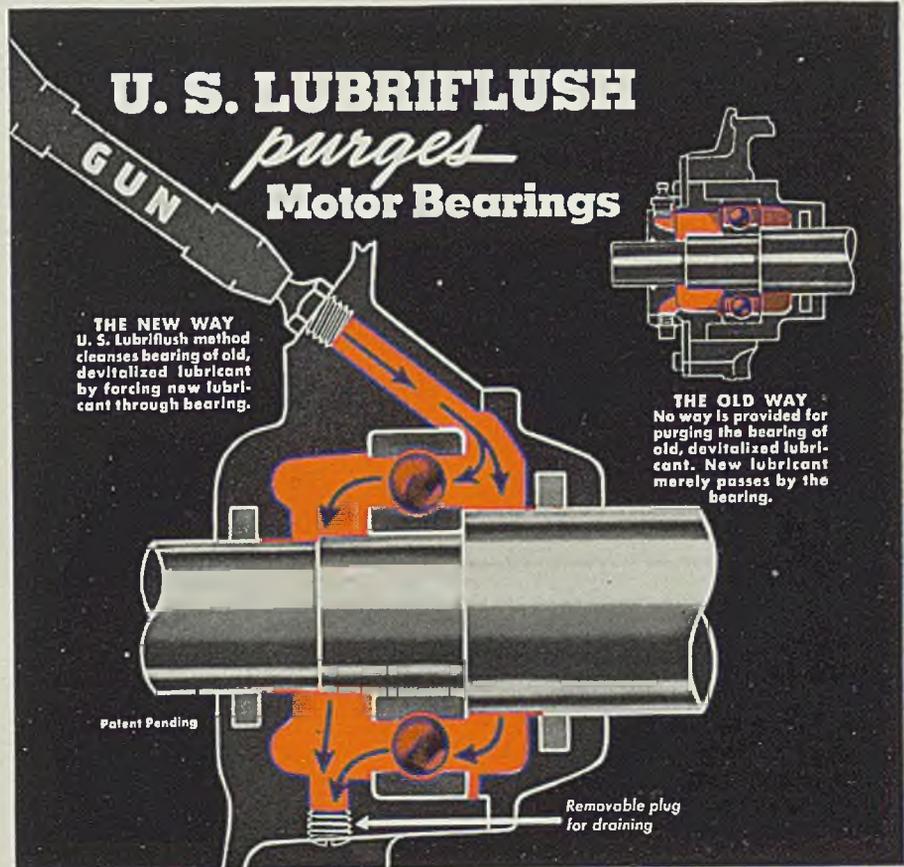
electrolytic ore reduction plants and other electro-chemical metal refineries, as friction roll coverings for business machines and recording instruments and large photographic developing and printing plants.

Announces New Method For Cleaning Brass

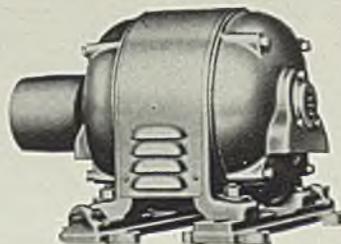
■ An improved method for cleaning brass before bright nickel or chromium plating, called the Oakite Oxbrite process, is announced by Oakite Products Inc., 22 Thames street, New York. It has been successfully used under actual pro-

duction requirements in a number of plants.

The new method eliminates the necessity of a cyanide dip and a copper strike before bright nickel plating and makes possible the bright nickel plating of soft soldered work without preliminary copper plating. It also provides assurance of freedom from peeling of electroplated deposits caused by inadequate preparation of the surfaces, besides effectively removing foreign matter so that uniform electroplated deposits are obtained. Two alternate procedures for applying the process are available.



Most advanced method of thoroughly cleansing bearings



Here indeed is a revolutionary improvement in the lubrication of motor bearings. U. S. Lubriflush allows new lubricant to be introduced to the innermost recesses of the bearing, forcing the old, worn-out lubricant from the bearing and out of the motor through a bottom drain. The bearing is purged of sludgy, devitalized grease, and renewed with clean lubricant. Bearing life is greatly increased. The U. S. Lubriflush system eliminates the necessity of disassembling the bearing to cleanse it. No extra charge is made for Lubriflush if specified on your order.

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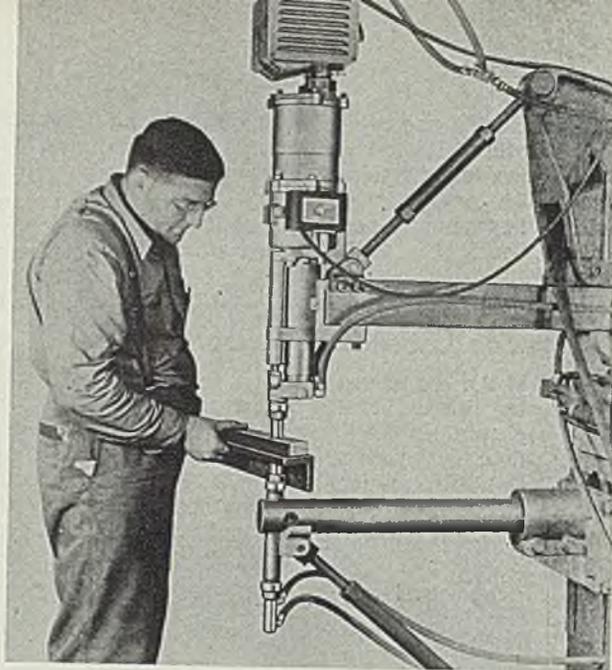
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Structural sections are spot welded as easily as sheet metal

Forge Welding Heavy Sections

A modified spot welder applies shots of heat and hammer blows superimposed upon constant electrode pressure to weld heavy sections at good speed. Two 1-inch plates are joined easily

■ FORGE WELDING is a process of heavy-duty electric resistance welding for spot welding heavy steel, iron and metal sections heretofore considered extremely difficult or impossible to weld with conventional equipment. With it, such work can be handled almost as easily and rapidly as spot welding sheet metal.

The process as announced by Progressive Welder Co., 3031 East Outer drive, Detroit, has the promise of opening up new fields for resistance welding for fabrication of structural steel assemblies. The fabrication of heavy sections for defense equipment are within its capacities and may prove important in the defense program.

In principle the process harks back to—and derives its name from—one of the earliest form of welding: Heating, forging, reheating, reforging, and so on. In comparison, however, the new process is extremely rapid. Although developed a year ago, announcement has not been made until completion of field tests on various types and thickness of metals under actual service conditions. Welding two pieces of $\frac{3}{8}$ -inch stock to a 1-inch section, welding together two 1-inch sections

and the like are typical of work now being done.

Surprisingly, resistance forge welding requires no highly specialized or expensive equipment. It is done on a variation of a standard welder. Resistance forge welding consists of first applying pressure to the work, then interrupted current, and finally superimposing a hammering action on the electrode. Under high pressure and with sufficient heat, the work surfaces are brought into such intimate contact that a forged weld of superior quality is obtained when additional "impact-pressure" and intermittent heat are applied.

To secure the forging effect while yet holding the work under pressure, a compound action Hydro-Booster—another recent development—is used. With it, a rapid succession of blows can be superimposed upon the initial constant pressure under which the work is being held.

The equipment recommended consists of a standard pedestal-type welder having the compound Hydro-Booster mounted on the upper arm immediately above the welding electrodes (see illustration). The booster consists essentially of two cham-

bers, one above the other, each capable of receiving air at 90-pound pressure individually or separately. The piston of the upper chamber can act on the top of the lower piston to increase the resultant welding pressure. In this manner, the lower piston supplies the necessary initial pressure, while the upper piston can act independently to superimpose the hammer blows required for the process. The initial pressure of 2000 pounds, together with sufficient heat, brings the surfaces of the work into intimate contact. Then the combination of interrupted heat and intermittent hammering (approximately 1000 pounds per blow) combine to complete the weld.

Special equipment required is of the "accessory" type. A special timer controls sequence of operation for most any condition. A special alloy electrode has been developed to withstand the high pressures and heat. Size of spots varies according to metal and other conditions, but generally on work totaling $1\frac{1}{2}$ inches in thickness the spot will be approximately 1 inch in diameter near the surface with the diameter about 50 per cent larger as it approaches the mid-

section—wholly typical of the forging action.

To suit varying metal thicknesses, types of alloy and so on, the number of heat interruptions and forging blows can be varied. On certain types of work, shots of heat and application of forging pressure will be synchronous, while heat and pressure are applied alternately on other types.

Portable spot welding guns can be used for resistance forge welding—primarily on work up to about

$\frac{1}{2}$ x $\frac{1}{2}$ -inch. With such equipment the process differs in that pressure is supplied in two stages; First, a welding or contact pressure; then a heavy "squeeze" or forging pressure. Otherwise the operation is essentially the same. The reason for the variation, of course, is that a full forge-welding head would be too cumbersome on a portable gun. On large guns for special work when the gun suspension is properly engineered, full forge welding has proved satisfactory.

tions covered clay and concrete pipe, masonry units; road and paving materials; roofing materials; glass and glass products; electric insulating material. For details on these or other specifications mentioned, refer to American Society for Testing Materials, 260 South Broad street, Philadelphia.

Many New Standards Approved by Society for Testing Materials

■ AS A result of discussion and information brought out at recent annual meeting of the American Society for Testing Materials, the society's committee E-10 on standards approved for publication a number of new tentative specifications and tests at its meeting on Aug. 28, 1940. Also it took favorable action on numerous revisions in various ASTM standards and tentative standards. This committee has the authority in the interval between annual meetings to act for the Society in a judicial capacity to determine whether the various standing committees on materials have reached a substantial consensus on their recommendations.

Corrosion-Resisting Steel Sheet, Strip and Plate: On recommendation of committee A-10 on iron chromium, iron chromium nickel, and related alloys, a new tentative specification will be published covering soft corrosion-resisting chromium-nickel steel sheet, strip and plate for fusion-welded unfired pressure vessels. Four grades are set up labeled S, M, C and T carrying type numbers 304, 316, 347 and 321 classified according to chemical and physical test requirements. Tensile strength minimum is 75,000 pounds per square inch, yield strength minimum is 30,000 pounds per square inch, elongation in 2 inches, is 30.0 per cent minimum. Tests required include bend, tensile strength, intergranular corrosion, and hardness. Detailed finish requirements are also included.

Non-Ferrous Metals and Alloys: Consideration by committee B-2 on nonferrous metals and alloys of needed revisions in the specification requirements for solder metal (B 32) resulted in recommendations (approved by committee E-10) involving the reissuance of the specifications as tentative to carry the designation B 32-40T. The requirements cover two grades of tin-lead and tin-lead-

antimony alloys in any form commercially known as soft solder and designated respectively A and B. Recommended practice is given in an appendix to the specifications, together with a table showing liquidus and solidus temperature, also certain physical properties. This information serves as a guide to the purchaser in selecting the alloy best suited for meeting his requirements. While specific chemical compositions are not set up, different compositions are suggested. Permissible variations in various chemical contents are specified. Requirements for sampling for chemical analysis, preparation of sample of bars and ingots for analysis, and methods of analysis are prescribed.

A recommendation in the field of cast and wrought copper and copper alloys of predominant importance was the proposed tentative specification for copper-base alloys in ingot form for sand castings to replace the existing standard B 30-36 and the tentative specifications B 123-39T covering leaded nickel brass and leaded nickel bronze in ingot form for sand castings. These specifications not only fill a long felt need in the foundry industry, but are significant from the standpoint of industrial preparedness in which work committee B-5 on copper and copper alloys has been active. Twenty-five alloys are covered. Nominal compositions are provided and requirements on chemical properties and tests.

Another committee B-5 recommendation involved the revision of tentative specifications for seamless copper tubes (B 75-40 T) on requirements for seamless copper tubing suitable for general engineering purposes which may be of three types—phosphorus deoxidized copper, oxygen free copper and arsenical copper.

Other new and revised specifica-

Steel Corrosion Data Put in Popular Form

■ *Corrosion of Iron and Steel*, by J. C. Hudson; 319 pages, 5½ x 8¾ inches; cloth; published by D. Van Nostrand Co. Inc., New York, for \$5.75.

This is a general account of the work of the corrosion committee of the Iron and Steel Institute and the British Iron and Steel Federation. It contains an introduction by Dr. W. H. Hatfield, chairman, and Dr. T. Swinden, vice chairman of the committee.

The committee has published five reports, going into great detail on the subject of corrosion, by some considered too detailed for the practical man. It was decided, therefore, to prepare a volume simple in form but accurate in detail, to appeal to all those who wish to apply the results and at the same time be of value to the scientific worker in securing a continuance of the research effort.

Some chapter headings will indicate the scope of the work: Significance of rolling scale in the rusting process; rusting of unprotected iron and steel in the atmosphere; prevention of rusting by means of paints; protective coatings; rusting of iron and steel immersed in sea water; rusting of iron and steel in other fields of service; what remains to be done in preventing rusting.

Aluminum Electroplated By Simple Process

■ Colonial Alloys Co., Colonial Philadelphia building, Philadelphia, announces an easy process for commercially electroplating Colalloy, aluminum and aluminum alloys. It consists of a 2 to 4-minute dip in a solution known as Pre-plate. No electrolytic preparation is necessary and the chemical solution is used at room temperature. After this dip, the product is ready for the regular plating bath. No special tank or equipment are necessary. The use of the solution, no difficulty is experienced with the oxide coat, and it creates a dense bonding base for the metal that is to be plated on it. In addition it provides the aluminum base metals with increased corrosion and abrasion resistance properties.

Rolling Mill Equipment

(Concluded from Page 57)

or loose metal is removed from the areas to be built up. This is accomplished by means of a cutting torch or by chipping and grinding. The piece is then preheated to a temperature between 400 and 500 degrees Fahr. A carbon steel rod of comparable analysis is used to make the initial deposit and build up these areas to within $\frac{1}{2}$ -inch of the finished surface. Each bead must be peened as applied to stress relief and produce a more dense deposit, thus making the material less susceptible to flow under impact. The additional material needed to complete the build-up to template size is applied with electrodes of Amsco nickel-manganese steel, containing 3 $\frac{1}{2}$ to 4 per cent nickel and 14 per cent manganese, with 0.75 to 0.90 per cent carbon.

It is essential that each bead of the nickel-manganese deposit be thoroughly peened not only for stress relief, but also to increase the brinell hardness of the deposited metal toward its ultimate hardness, which is between 400 and 450 brinell. This operation, it was found, reduces the initial flow of the deposit in service and produces a much smoother finished surface. Any high spots should be removed with a hand grinder when welding has been completed so that all surfaces conform closely to the template. As a measure of precaution to prevent spalling in service, a dovetail or groove should be provided at the back of each pod to allow for any stretch or flow of the weld metal which may take place. This groove should be about $\frac{1}{4}$ -inch wide and $\frac{1}{2}$ -inch deep, as indicated on Fig. 1.

In case the part is of the Hadfield

Fig. 3—Coupling box of standard type being built up to its normal inside dimensions

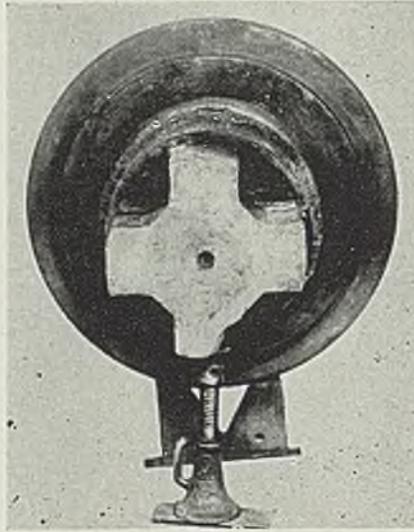
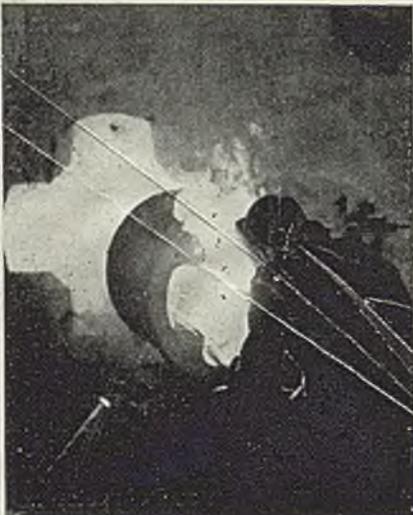


Fig. 4—Roll pod showing the excessive wear that occurs and details of the built-up areas

or 14 per cent manganese steel analysis, loose or spalled material is removed by grinding. Preheat temperatures must be limited to 300 degrees Fahr., as prolonged heating at temperatures above 400 degrees has a detrimental effect on the physical properties of 14 per cent manganese steel. Heating, however, does not affect nickel-manganese steel. The entire build-up is then made with nickel-manganese steel electrodes, as described.

Fig. 2 shows a welder in action working on a typical spindle or crab. Fig. 3 shows a welder building up a coupling box of standard type to its normal inside dimensions. Fig. 4 depicts the excessive wear that takes place on these parts and the details of the built-up areas.

The procedure for reclaiming coupling boxes follows that of the spindles and crabs insofar as preparation, preheating and general welding practice is concerned. The initial build-up material, however, should be nickel-manganese steel, which is applied to within $\frac{1}{4}$ -inch of finish dimensions. As all deposits are made on the interior of the casting, peening is difficult and the effects of it, in increased hardness of the material deposited, are not as great. To compensate for this condition and also to provide a metal of different analysis and characteristics to work opposite the nickel-manganese applied to the spindles, the final $\frac{1}{4}$ -inch to reach finish dimensions should be deposited with a hard facing welding rod. A coating of tough, impact and abrasion resistant material, having a brinell hardness between 450 and 500 as deposited, will thus be provided where the wear and impact are greatest. This hardface will furnish a dense, smooth de-

posit free from porosity or other defects and will require little grinding to produce a surface sufficiently smooth and close to dimensions to be advantageous from a standpoint of wear and adequate bearing.

An appreciable saving in maintenance costs can be made in reclamation work of this nature. The procedures as given have been tested and proved to accomplish such results.

New McCord Gasket Increases Motor Life

■ Interesting new development in cylinder head gaskets has been the outgrowth of months of laboratory work and road testing by the Wyandotte Gasket division of McCord Radiator & Mfg. Corp., 2587 East Grand boulevard, Detroit. The product is known as the Steel-Seal gasket and is being used under cylinder heads of Buick engines for 1941.

The gasket is stamped from a single piece of hot-rolled strip steel, 0.0015-inch thick and after stamping is given a series of embossing, the location of the latter accurately determined to meet conditions in the engine. The embossed steel, punched out to the proper contours then is given a coating of inorganic material which, under heat swells and sets, effectively sealing the gasket, in fact even better than a ground joint, according to Arthur Gobb, plant manager of the Wyandotte division.

Chief feature of the thin gasket is that it results in more even gasket pressure which has been found to provide less distortion in valves and cylinders, thereby leading to increased motor life and less oil pumping.

Strange as it may seem, it has been discovered that if cylinder bolts are tightened excessively, they actually tend to pull metal away from cylinder walls and give rise to oil pumping. Cylinder head gaskets now used by most car builders are of two pieces of steel, between which is a layer of asbestos. This construction naturally is four or five times as thick as the new McCord gasket.

Reduces Time for Grain Work in Finishing

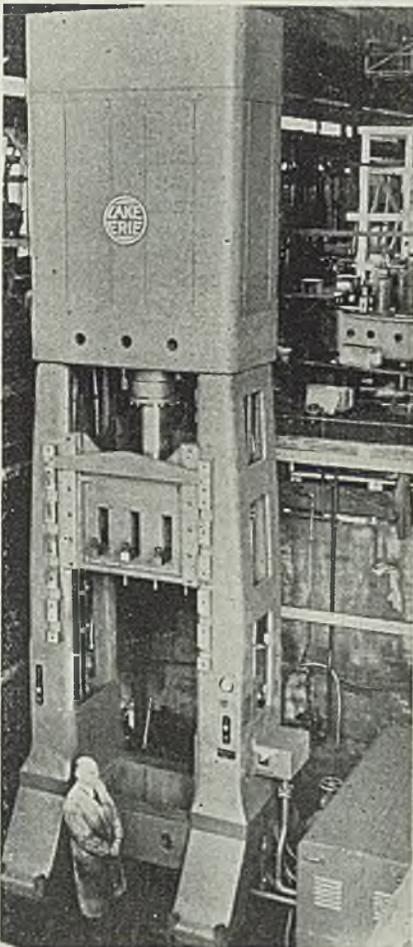
■ A finishing schedule that reduces the time required for grain work is announced by Maas & Waldstein Co., Newark, N. J. It utilizes a special speed primer as the base coat. The coat will dry out of dust in 5 minutes and is ready to receive the graining ink within an hour. After the ink is dry, good results can be obtained by using a clear air-drying lacquer as the top coat, eliminating baking.

Arc Welder

■ General Electric Co., Schenectady, N. Y., has introduced a new 500-ampere alternating-current arc welder with high power factor. When operated below half load, it provides leading reactive kilovolt ampere for improvement of the shop power-factor; and when operated at no load, there is a 19.5 kilovolt ampere available for this purpose. Other advantages include finger-tip adjustment, a large, easily read current indicator extending up the side of the transformer case, protected output terminals and fan-forced ventilation. The new welder is less than 4 feet in height, 21 inches in diameter and has a net weight of 600 pounds.

Hydraulic Press

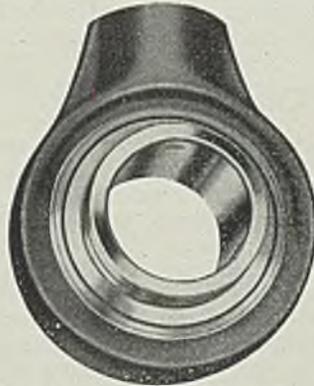
■ Lake Erie Engineering Corp., Buffalo, has introduced an unusually long stroke 150-ton hydraulic press specially designed for drawing cartridge cases. It has a 108-inch daylight and 76-inch stroke. The housing is of the solid type, incorporating a gib-guided platen. Adjustable knock-out bars are provided for other types of work. Push-buttons control inching semiautomatic and full automatic operation.



Top of press is completely enclosed in removable panels. High speed pumping unit gives maximum production with fast approach and return of moving platen.

Hanger Bearings

■ Stephens-Adamson Mfg. Co., Aurora, Ill., has placed on the market Sealmaster hanger bearings for screw conveyors. They are lubricated for life and are fitted with



standard Sealmaster seals arranged to form an air-tight chamber which keeps out dirt and retains lubricant. Bearing housings are of Meehanite construction and all but the bronze alloy retainer are specially treated to resist rust. For mounting bearing on shaft, one-half dog-point set screws with lock wires are furnished as standard equipment.

Profilometer Units

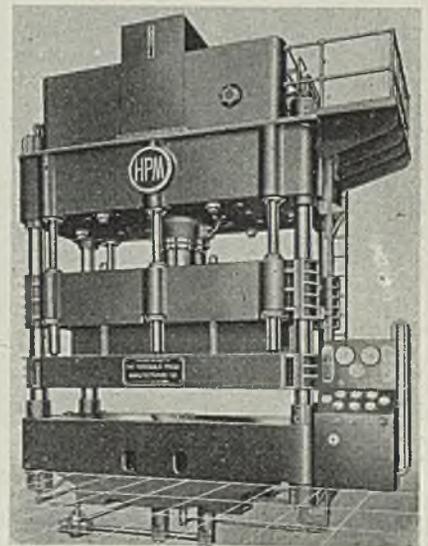
■ Physicists Research Co., Ann Arbor, Mich., has developed two new accessories for use with its Profilometer which is used for the measurement of surface roughness. The first of the accessories, known as the Mototrace is for mechanical operation of the tracer which is moved across the surface to be measured. It has four specific applications. It is used when the tracer is on very narrow surfaces or small areas where the available tracing distance is only $1/32$ to $1/8$ -inch, in awkward places near shoulders and holes, where the tracing distance is restricted, on very smooth surfaces where extraneous vibration makes manual tracing difficult, in small holes or other surfaces measured with the type I tracer described below. Two motions are provided. The first is a constant speed linear motion, automatically reversing at both ends. The length of stroke is $1/4$ to $2 1/4$ inches, adjustable at both ends. The second motion is a cam-driven constant-speed, quick-reversal reciprocating motion, adjustable from $1/64$ to $1/8$ -inch. A special tracer design-



nated as type I is for measuring the roughness inside holes as small as $1/2$ -inch diameter. A modification for even smaller holes can also be furnished on special order. The type I tracer also is useful for measuring the roughness of gear teeth and other difficult-to-reach surfaces. The close spacing of the pilot skirts of this tracer makes it desirable to use the Mototrace. In addition, the company is making available a special profilometer with a one micro-inch scale. This special model incorporates an additional point on the range switch, giving three times the sensitivity of the standard model.

Blankholder Press

■ Hydraulic Press Mfg. Co., Mount Gilead, O., has introduced a 650-ton triple-action blankholder press for deep drawing gasoline tanks and other similar parts for the aircraft



industry. It embodies three separate hydraulic actions for operating, respectively, the main draw punch, the blankholder ring and the die bottom of the regulation triple-action drawing die. The draw punch is carried by the main slide actuated by the main hydraulic press ram of

a double acting piston design.

The alignment of blankholder die ring is rigidly supported by a blankholder platen directly above. Individual pressure adjustment of each blankholder ram, permits the variation of blankholder pressure at six separate points. All three hydraulic actions function from only one hydro-power piston type radial pump directly connected by one flexible coupling to an electric motor. The press has a closing speed of 260 inches per minute and a pressing speed of 45 inches per minute.

Electric Detector

■ Sperry Products Inc., Hoboken, N. J., has introduced a type C-1-A detector for tubes which may be conveniently located in any tube mill. It is operated by one man, operations being facilitated by the

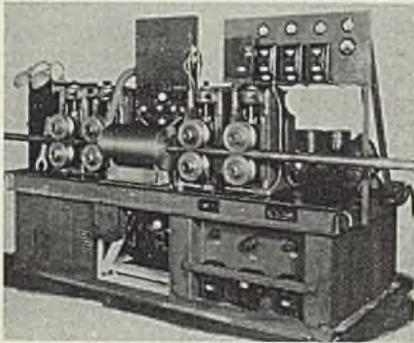
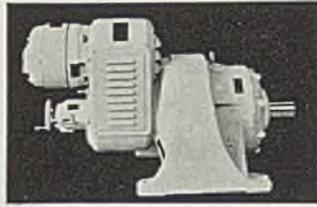


table mounting of amplifiers, energizing and detector coils, drive rolls and controls. A motor-generator set for supplying energizing current, roll drive motors, and other related parts are located underneath the table. Power to operate all equipment is supplied through a single conduit connection. The detector has automatic control—stops tube movement at each defect signal—testing speeds from 30 to 100 feet per minute. It detects slivers, seams, dents and leakers in welds. It is supplied on a rental basis, giving the tube manufacturer the advantages of expert supervision and the latest improvements.

Syncrogear Units

■ U. S. Electrical Motors Inc., 200 East Slauson avenue, Los Angeles, has placed on the market types VEV-GD and VEV-GT motors of the varidrive speed design. These incorporate double reduction and triple reduction gears for low speed drives. The construction of these units does not require a sub base to mount the Varidrive and Syncro-gear as a unit. Further modifications allow mounting of the Varidrive case at any angle with respect

to the gear case. The pyramidal gear pedestal provides both a rigid mounting for the drive case and a



sturdy motor capable of withstanding the heavy torsional stress.

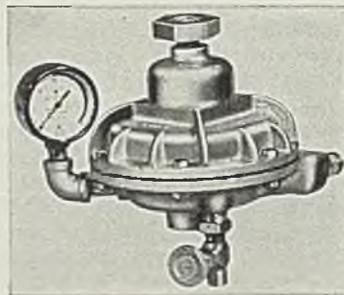
Die Cast Switch

■ Micro Switch Corp., Freeport, Ill., announces a Micro switch equipped with a roller type plunger and a castellated brass bushing which accepts the roller either longitudinally or cross-wise. Adjustment for actuation by cam or slide in either of the two castellated positions is quickly made by removal of the bearing screw. The housing of the switch is die cast, and is available in either zinc or aluminum.

The switching element is a small, single pole, snap action switch with a rating of 1200 watts, up to 600 volts, alternating current. It may be furnished with normally closed, open, or double-throw contacts. Wiring terminals accept up to No. 10 wire. The hub accepts standard 1/2-inch conduit.

Regulators

■ Sight Feed Generator Co., Richmond, Ind., announces a 2-stage regulator for use with Sight Feed acetylene generators. Its large diaphragm assures even pressure at all



times. The regulator fits in the outlet valve opening. It is regularly furnished with one service outlet valve although openings are available for two valves.

Disk Grinder

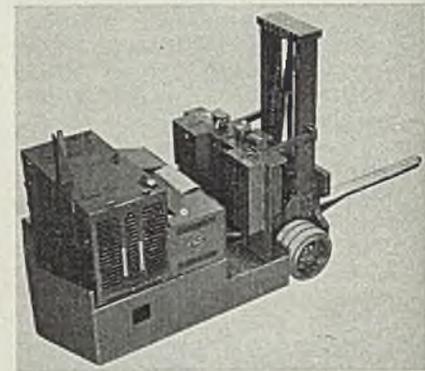
■ Hisey-Wolf Machine Co., Cincinnati, announces design changes in its direct-drive disk grinders. Extra heavy end bells with feet are em-

ployed which carry the bearings directly behind the disks. The bearing construction has been improved, as has the method of lubrication. Oilers are of the constant level type with sight supply. The motor is totally enclosed with a circulation of air passing through it, through the feet of end bells into the pedestal and back through the motor again.

Guards can be supplied with exhaust connections. Combination machines also can be furnished with a disk on one end and a regular grinding wheel or buffing extension on the other side.

Ram and Fork Trucks

■ Elwell-Parker Electric Co., 4205 St. Clair avenue, Cleveland, has introduced a new heavy-duty F-6 ram truck and gasoline fork truck for handling wide strips of steel. Hav-



ing a 16,000-pound capacity, it features front wheel drive and trail wheel steel. It is built for tilting or nontilting, for accommodation of ram, fork or up-ending devices. The truck is steered by means of a master control. The motor-powered steering mechanism is located at one side of the operator's position in center of the truck. The motor drives front wheels through triple gear reduction. The tilt and hoist units are located between control dash and load. The size of the drive tires are 22 3/4 x 18 inches—trail tires (four) 18 x 7 inches.

Cable Clamp

■ Ohio Brass Co., Mansfield, O., announces a larger size clamp for dead-ending bus conductors in stations or line conductors at towers. It is suitable for 0.54-1.00-inch cables. The clamp is designed to allow a cable to pass through the dead-ending device in a straight line. This prevents twisting of wire and clamp, providing greater clearance. The clamp also can be connected directly to a clevis-type suspension insulator. A stringing loop at one end of the clamp simplifies installation. The clamp is of malleable iron, hot-dip galvanized and its surfaces are free from sharp points.

Railroad, Automotive Steel Demand Heavier

*Freight car orders largest of year to date.
Defense program stimulates shape, plate and
bar sales. Pig iron active. Scrap stronger*

■ WHILE heavy orders identified with the defense program still hold the spotlight in steel markets, expanding requirements of the railroads, automotive industry and miscellaneous consumers are important factors in sustaining total demand and production.

Mill backlogs of most products are steady or heavier, as reflected in gradually lengthening deliveries on certain items. Fears of some buyers that armament steel needs will lead to a shortage of material, or at least to serious delivery delays, are not shared by producers who maintain that capacity is adequate to meet orderly buying.

Structural shape deliveries have been backed up six to eight weeks, partly the result of awards for armament plants, and with the time element an important factor in placing of building contracts, fabricators are attempting to build up stocks of standard sections.

The navy continues a source of substantial orders, although in the case of shipbuilding requirements steel deliveries will be spread over an extended period. Recent navy awards include 44 destroyers and four cruisers, involving 54,000 tons of plates and 26,400 tons of shapes, and 7000 tons of structurals for drydocks, hangars and other facilities. In addition, bids have been opened on 85,000 tons of plates, shapes, bars, sheets and strip for miscellaneous naval purposes.

Three cargo ships placed by the maritime commission for Ocean Steamship Corp. will require 13,800 tons of steel.

Railroads placed more freight cars the past week than in any entire month so far this year, and several large rail orders are in early prospect. Latest car awards involved 7985 units, bringing the September total to date to 9735. While the latter is far short of the 23,000 cars booked in September, 1939, orders so far this year of 39,297 units compare with 35,456 in the first nine months of last year.

Principal car purchases include 3230 for the Southern, 1050 for the Reading, 1000 each for the Union Pacific and Norfolk & Western, 600 for the Pere Marquette and 500 each for the Soo line and Louisville & Nashville. Rail orders are headed by 31,000 tons for the Louisville & Nashville and 10,000 tons for the Virginian. Pending rail business is topped by 65,000 tons for the New York Central, 60,000 tons for the

Southern Pacific and 35,000 tons for the Northern Pacific.

Fabricated shape and concrete reinforcing bar orders hold at a brisk rate. Outstanding are 6210 tons of shapes for a Charlestown, Ind., powder plant, 4550 tons of shapes for an air corps hangar and repair shop, Mobile, Ala., and 7000 tons of bars for Bon-neville dam.

Ford Motor Co. has placed 9000 tons of structurals for its new aircraft engine plant.

Spurred by an active retail market, automobile production is expanding rapidly, with an accompanying stimulating effect on steel consumption. Assemblies last week jumped more than 17,000 units to a total of 95,990 cars and trucks, almost 50 per cent above the 64,365-unit output a year ago.

Pig iron buying and shipments have expanded more noticeably this month, deliveries in most districts reaching the best pace so far this year. Consumers are interested in covering forward needs, but demand largely is predicated on estimated requirements and is not of a speculative nature.

Restriction of iron and steel exports to Great Britain and the western hemisphere is seen as unlikely to have an important effect on the domestic market. Principal outlet shut off is Japan which took 137,429 tons of the 346,087 tons exported to all countries in August. This compares with 136,604 tons shipped to the United Kingdom. Meanwhile, domestic scrap prices continue to rise, the composite increasing 33 cents last week to \$20.46. A year ago it was \$20.75.

Finished steel prices generally are steady, although attractive tonnages occasionally bring out concessions. However, dollar realization per ton of steel shipped this half appears likely to be well above the average return the first six months.

Ingot production was steady in six districts last week as the national steelmaking rate held at 93 per cent. Losses of 2½ points to 96 per cent at Chicago and 2 points to 86 at Cleveland were offset by gains of 9 points to 88 at Cincinnati, 3 points to 94 at Detroit, 5 points to 85 in New England and 1 point to 84 at Youngstown. Unchanged were Birmingham at 97, St. Louis at 80, Pittsburgh at 88½, Wheeling at 97, Buffalo at 90½ and eastern Pennsylvania at 92.

MARKET TABLOID

Demand

Steady or heavier; backlog expanding.

Prices

Generally holding; scrap still advancing.

Production

Unchanged at 93 per cent

COMPOSITE MARKET AVERAGES

	Sept. 28	Sept. 21	Sept. 14	One Month Ago Aug., 1940	Three Months Ago June, 1940	One Year Ago Sept., 1939	Five Years Ago Sept., 1935
Iron and Steel	\$37.98	\$37.96	\$37.94	\$37.70	\$37.69	\$36.67	\$32.82
Finished Steel	56.60	56.60	56.60	56.60	56.60	55.60	53.70
Steelworks Scrap . . .	20.46	20.13	20.13	18.71	19.03	17.97	12.65

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material	Sept. 28,	Aug.	June	Sept.	Pig Iron	Sept. 28,	Aug.	June	Sept.
	1940	1940	1940	1939		1940	1940	1940	1939
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh	\$24.34	\$24.34	\$24.34	\$23.35
Steel bars, Chicago	2.15	2.15	2.15	2.15	Basic, Valley	22.50	22.50	22.50	21.50
Steel bars, Philadelphia	2.47	2.37	2.37	2.37	Basic, eastern, del. Philadelphia	24.34	24.34	24.34	23.54
Iron bars, Chicago	2.25	2.25	2.25	2.05	No. 2 foundry, Pittsburgh	24.21	24.21	24.21	23.20
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago	23.00	23.00	23.00	22.20
Shapes, Philadelphia	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham	19.38	19.38	19.38	18.58
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2 del. Cincinnati	22.89	22.89	22.89	22.09
Plates, Pittsburgh	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ. av.)	25.215	25.215	25.215	24.415
Plates, Philadelphia	2.15	2.15	2.15	2.15	Malleable, Valley	23.00	23.00	23.00	22.00
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Chicago	23.00	23.00	23.00	22.50
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.00	Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	29.84
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh	23.17	23.17	23.17	22.15
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh	125.33	125.33	115.33	95.35
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.00					
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05					
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50					
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60					
Tin plate, per base box, Pitts.	\$5.00	\$5.00	\$5.00	\$5.00					
Wire nails, Pittsburgh	2.55	2.55	2.55	2.40					

Semifinished Material	Sept. 28,	Aug.	June	Sept.	Coke	Sept. 28,	Aug.	June	Sept.
	1940	1940	1940	1939		1940	1940	1940	1939
Sheet bars, Pittsburgh, Chicago	\$34.00	\$34.00	\$34.00	\$34.00	Connellsville, furnace, ovens	\$4.75	\$4.75	\$4.75	\$3.75
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00	Connellsville, foundry, ovens	5.75	5.75	5.75	5.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00	Chicago, by-product fdry., del.	11.25	11.25	11.25	10.50
Wire rods No. 5 to 3/8-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		Granite City, Ill.				Plates				Gulf ports			
Hot Rolled		Middletown, O.				Sheets				Birmingham			
Pittsburgh		Youngstown, O.				Hot strip				St. Louis, del.			
Chicago, Gary		Pacific Coast ports				Cold stp.				Pacific Coast ports			
Cleveland		Black Plate, No. 29 and Lighter											
Detroit, del.		Pittsburgh											
Buffalo		Chicago, Gary											
Sparrows Point, Md.		Granite City, Ill.											
New York, del.		Long Ternes No. 24 Unassorted											
Philadelphia, del.		Pittsburgh, Gary											
Granite City, Ill.		Pacific Coast											
Middletown, O.		Enameling Sheets											
Youngstown, O.		No. 10 No. 20											
Birmingham		Pittsburgh											
Pacific Coast ports		Chicago, Gary											
Cold Rolled		Granite City, Ill.											
Pittsburgh		Youngstown, O.											
Chicago, Gary		Cleveland											
Buffalo		Middletown, O.											
Cleveland		Pacific Coast											
Detroit, delivered		Corrosion and Heat-Resistant Alloys											
Philadelphia, del.		Pittsburgh base, cents per lb.											
New York, del.		Chrome-Nickel											
Granite City, Ill.		No. 302 No. 304											
Middletown, O.		Bars											
Youngstown, O.		Plates											
Pacific Coast ports		Sheets											
Galvanized No. 24		Hot strip											
Pittsburgh		Cold strip											
Chicago, Gary		Straight Chromes											
Buffalo		No. No. No. No.											
Sparrows Point, Md.		410 430 442 446											
Philadelphia, del.		Bars											
New York, delivered		18.50 19.00 22.50 27.50											
Birmingham													

Buffalo	2.05c
Birmingham	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.70c

Iron

Chicago	2.25c
Philadelphia, del.	2.37c
Pittsburgh, refined	3.50-8.00c
Terre Haute, Ind.	2.15c

Reinforcing

New Billet Bars, Base	
Chicago, Gary, Buffalo,	
Cleve., Birm., Young,	
Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Rail Steel Bars, Base

Pittsburgh, Gary, Chi-	
cago, Buffalo, Cleve-	
land, Birm.	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.50c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails \$2.55

(Per Pound)

Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c

Woven wire fencing (base C. L. column) 67

Single loop bale ties, (base C.L. column) 56

Galv. barbed wire, 80-rod spools, base column 70

Twisted barbless wire, column 70

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago Birmingham (except spring wire)

Bright bess., basic wire. 2.60c

Galvanized wire 2.60c

Spring wire 3.20c

Worcester, Mass., \$2 higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh, keg. \$3.85

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-	
cago, Massillon, Can-	
ton, Bethlehem	2.70c
Detroit, delivered	2.80c

	Alloy	Alloy	
S.A.E.	Diff.	S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.	0.55		
4800 0.20 to 0.30 Mo. 1.50-			
2.00 Ni.	1.10		
5100 0.80-1.10 Cr.	0.45		
5100 Cr. spring flats	0.15		
6100 bars	1.20		
6100 spring flats	0.85		
Cr. N., Van.	1.50		
Carbon Van.	0.85		
9200 spring flats	0.15		
9200 spring rounds, squares	0.40		
Electric furnace up 50 cents.			

Alloy Plates (Hot)

Pittsburgh, del.	3.275c
Chicago, del.	3.28c

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, Middle-	
town, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast ports	2.75c

Cooperage hoop, Young, Pitts.; Chicago, Birm. 2.20c

Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown, Chicago 2.80c

Detroit, del. 2.90c

Worcester, Mass. 3.00c

Carbon Cleve., Pitts. 2.80c

0.26-0.50 4.30c

0.51-0.75 6.15c

0.76-1.00 8.35c

Over 1.00 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. \$2.50-35.50

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

Effective Oct. 1

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Dis-

counts for carloads additional 5%, full containers, add 10%.

Carrriage and Machine

½ x 6 and smaller. .68 off

Do., ¾ and 1. .66 off

Do., ¾ to 1. .64 off

Tire bolts .52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts .60 off

Plow bolts .68.5 off

Nuts

Semifinished hex. U.S.S. S.A.E. ½-inch and less. 66 70

¾-1-inch 63 65

1½-1-inch 61 62

1½ and larger 60

Hexagon Cap Screws

Upset 1-in., smaller 70.0 off

Square Head Set Screws

Upset, 1-in., smaller 75.0 off

Headless set screws 64.0 off

Piling

Pitts., Chgo., Buffalo 2.40c

Gulf ports 2.85c

Pacific Coast ports 2.95c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., B'ham.

Structural 3.40c

¾-inch and under 65-10 off

Wrought washers, Pitts., Chl., Phila., to jobbers and large nut, bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1-3	68½	60½

Iron

¾	30	13
1-1½	34	19
1½	38	21½
2	37½	21

Lap Weld Steel

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

Iron

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

Line Pipe Steel

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

Iron

¾ butt weld	25	7
1 and 1½ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seam- less steel boiler tubes, cut- lengths 4 to 24 feet; f.o.b. Pitts- burgh, base price per 100 feet subject to usual extras.

Lap Welded

	Sizes	Gage	Steel	Char- coal
1½" O.D.	13	\$ 9.72	\$23.71	Iron
1¾" O.D.	13	11.06	22.93	Buffalo, del.
2" O.D.	13	12.38	19.35	Detroit, del.
2¼" O.D.	13	13.79	21.68	Philadelphia, del.
2½" O.D.	12	15.16	.....
2¾" O.D.	12	16.58	26.57	
3" O.D.	12	17.54	29.00	
3½" O.D.	11	18.35	31.36	
4" O.D.	11	23.15	39.81	
4½" O.D.	10	28.66	49.90	
5" O.D.	9	44.25	73.98	
5½" O.D.	7	68.14	.....

Seamless

	Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	\$ 7.82	\$ 9.01	
1¼" O.D.	13	9.26	10.67	
1½" O.D.	13	10.23	11.79	
1¾" O.D.	13	11.64	13.42	

2" O.D.	13	13.04	15.08
2½" O.D.	13	14.54	16.76
2¾" O.D.	12	16.01	18.45
3" O.D.	12	17.54	20.21
3½" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	\$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00
Class A Pipe \$3 over Class B	
Std. ftgs., Birm., base	\$100.00.

Semifinished Steel

Rerolling Billets, Slabs

<i>(Gross Tons)</i>	
Pittsburgh, Chicago, Gary,	
Cleve., Buffalo, Youngs,	
Birm., Sparrows Point.	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chl., Gary, Cleve.,	
Young, Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young,	
Sparrows Point, Buf-	
falo, Canton, Chicago.	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago,	
Birmingham No. 5 to ¾-	
inch incl. (per 100 lbs.)	\$2.00
Do., over ¾ to 1¼-in. incl.	2.15
Worcester up \$0.10; Galves-	
ton up \$0.25; Pacific Coast up	\$0.50.

Skelp

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

Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, fur.	\$4.35- 4.60
Connellsville, fdry.	5.25- 5.50
Connell, prem. fdry.	5.75- 6.25
New River fdry.	6.25- 6.50
Wise county fdry	5.50- 6.50
Wise county fur.	5.00- 5.25

By-Product Foundry

Newark, N. J., del.	11.38-11.85
Chicago, outside del.	10.50
Chicago, delivered	11.23
Terre Haute, del.	10.75
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens.	7.50
Indianapolis, del.	10.75
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

<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 xylol	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
Eastern Plants, per lb.	
Naphthalene flakes, balls,	
bbis. 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.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	\$24.00	\$24.50	\$23.50	\$25.00
Birmingham, Ala.	19.38	.....	18.38	24.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	.....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	.....
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

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

Delivered from Basing Points:

Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	.....	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	.....	.....	.....	.....
Saginaw, Mich., from Detroit	25.31	25.31	24.81	25.81
St. Louis, northern	23.50	23.50	23.00	.....

St. Louis from Birmingham	23.12	.....	22.62	.....
St. Paul from Duluth	25.63	25.63	.....	26.13
†Over 0.70 phos.	.....	.....	.....	.....

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., \$28.50, base; \$29.74 delivered Philadelphia.

Gray Forge

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.)		
	Dry press	Wire cut	
Fire Clay Brick	.....	\$28.00	
Super Quality	.....	26.00	
Pa., Mo., Ky.	\$60.80	Magnesite	
First Quality	.....	Domestic dead-burned grains, net ton f.o.b.	
Pa., Ill., Md., Mo., Ky.	47.50	Chewelah, Wash., net ton, bulk	22.00
Alabama, Georgia	47.50	net ton, bags	26.00
New Jersey	52.50	Basic Brick	
Second Quality	.....	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Pa., Ill., Ky., Md., Mo.	42.75	Chrome brick	\$50.00
Georgia, Alabama	34.20	Chem. bonded chrome	50.00
New Jersey	49.00	Magnesite brick	72.00
Ohio	.....	Chem. bonded magnesite	61.00
First quality	39.90	Fluorspar	
Intermediate	36.10	Washed gravel, duty pd., tide, net ton	\$25.00-\$26.00
Second quality	31.35	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	20.00
Malleable Bung Brick	.....	Do, barge	20.00
All bases	\$56.05	No. 2 lump	21.00
Silica Brick	.....	
Pennsylvania	\$47.50		
Joliet, E. Chicago	55.10		
Birmingham, Ala.	47.50		

Ferroalloy Prices

Ferromanganese, 78-82%, carlots, duty pd.	\$120.00	Do., ton lots	11.75c	Do., spot	145.00	Silicon Metal, 1% iron, contract, carlots, 2 x 1/2-in., lb.	14.00c
Ton lots	130.00	Do., less-ton lots	12.00c	Do., contract, ton lots	145.00	Do., 2% Spot 1/4c higher	12.50c
Less ton lots	133.50	67-72% low carbon:		Do., spot, ton lots	150.00	Silicon Briquets, contract carloads, bulk, freight allowed, ton	\$69.50
Less 200 lb. lots	138.00	Car-Ton loads lots		15-18% ti., 3-5% carbon, carlots, contr., net ton	157.50	Ton lots	79.50
Do., carlots del. Pitts.	125.33	2% carb.	17.50c 18.25c	Do., spot	160.00	Less-ton lots, lb.	3.75c
Spiegelteisen, 19-21% dom.	.....	1% carb.	18.50c 19.25c	Do., contract, ton lots	160.00	Less 200 lb. lots, lb.	4.00c
Palmerton, Pa., spot	36.00	0.10% carb.	20.50c 21.25c	Do., spot, ton lots	165.00	Spot 1/4-cent higher.	
Do., 26-28%	49.50	0.20% carb.	19.50c 20.25c	Alsifer, contract carlots, f.o.b. Niagara Falls, lb.	7.50c	Manganese Briquets, contract carloads, bulk freight allowed, lb.	5.00c
Ferrosilicon, 50% freight allowed, c.l.	74.50	Spot 1/4c higher	20.75c	Do., ton lots	8.00c	Ton lots	5.50c
Do., ton lot	87.00	Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.	0.95	Do., less-ton lots	8.50c	Less-ton lots	5.75c
Do., 75 per cent	135.00	Calcium molybdate, lb. molyb. cont., f.o.b. mill	0.80	Spot 1/4c lb. higher		Spot 1/4c higher	
Do., ton lots	151.00	Ferrotitanium, 40-45% lb., con. ti., f.o.b. Niagara Falls, ton lots	\$1.23	Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk	7.00c	Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton	102.50
Spot, \$5 a ton higher.		Do., less-ton lots	1.25	Do., ton lots	7.50c	Do., spot	107.50
Silicomanganese, c.l., 2 1/2 per cent carbon	118.00	20-25% carbon, 0.10 max., ton lots, lb.	1.35	Do., less-ton lots	7.75c	34-40%, contract, carloads, lb., alloy	14.00c
2% carbon, 108.00; 1%, 133.00		Do., less-ton lots	1.40	Spot, 1/4c higher	8.00c	Do., ton lots	15.00c
Contract ton price \$12.50 higher; spot \$5 over contract.		Spot 5c higher		Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb.	\$2.50	Do., less-ton lots	16.00c
Ferrotungsten, stand., lb. con. del. cars	1.90-2.00	Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls	\$2.25	Do., smaller lots	2.60	Spot 1/4c higher	
Ferrovanadium, 35 to 40%, lb., cont.	2.70-2.80-2.90	Do., less-ton lots	2.30	Vanadium Pentoxide, contract, lb. contained	\$1.10	Molybdenum Powder, 99%, f.o.b. York, Pa.	\$2.60
Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage	75.00	Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill	0.80	Do., spot	1.15	200-lb. kegs, lb.	2.75
Ferrochrome, 66-70 chromium, 4-6 carbon, etc. lb., contained cr., del. carlots	11.00c	Ferro-carbon-titanium, 15-18% ti., 6-8% carb., carlots, contr., net ton	\$142.50	Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome	84.00c	Do., under 100-lb. lots	3.00
				Do., spot	89.00c	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant	80.00c
				88% chrome, contract	83.00c		
				Do., spot	88.00c		

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
							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	8.63	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.05	3.51	4.09	8.59	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.00	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	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	4.00	3.22	3.75	8.15	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	....	4.45	....	3.65	8.15	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.42	3.20	3.75	8.15	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.25	4.30	4.64	3.20	3.80	8.45	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	....	5.00	....	4.42	....	....
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.47	4.00	8.50	7.10
Chicago	3.50	3.40	3.40	3.55	3.55	5.15	3.05	4.10	4.60	3.30	3.75	8.15	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	....	4.76	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.70	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.33	4.33	5.93	3.99	....	5.71	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.88	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....	....	....	....
Seattle	4.00	3.85	5.20	3.65	3.75	5.75	3.70	6.50	5.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.60	4.45	4.00	4.00	6.40	4.30	6.50	5.25	....	6.60	10.65	9.80
San Francisco	3.50	4.00	6.00	3.35	3.35	5.60	3.40	6.40	5.15	....	6.80	10.65	9.80

	S.A.E. Hot-rolled Bars (Unannealed)				
	1035-1050 Series	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.20	5.75	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.48	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 300-4999 in San Francisco, Portland; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, 1500-3499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 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—

Domestic Prices at Works or Furnace—

By Cable or Radio

Last Reported

	British gross tons U. K. ports	Quoted in dollars at current value	Continental Channel or North Sea ports gross tons:		Fdy. pig iron, Sl. 2.5	Basic bess. pig iron	Furnace coke	Billets	Standard rails	Merchant bars	Structural shapes	Plates, ½-in. or 5 mm.	Plates, ¼-in. or 5 mm.	Sheets, black	Sheets, galv., corr., 24 ga. or 0.5 mm.	Plain wire	Bands and strips	French	Belgian	Reich				
			gross tons	**Quoted in gold pounds sterling														£ s d	Francs	Francs	Mar			
Foundry, 2.50-3.00 Sl.	....	\$33.23	3	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	788	\$31.44	950	\$25.33	63
Basic bessemer	....	....	....	....	22.83	5	13	0	0	0	0	0	0	0	0	0	0	0	29.79	900	27.94	(b)	69.50
Hematite, Phos. .03-.05	6.77	1	13	5	4.91	225	10.92	320	7.64	19	42.42	10	10	0	20.62	1.221	42.20	1.275	38.79	96
Billets	\$31.95	3	15	0	0	0	0	0	0	0	0	0	0	2.30c	12	15	6	1.69c	1.692	2.06c	1.375	2.38c	132
Wire rods, No. 5 gage	60.71	7	2	6	2.78c	15	8	6	1	1.53c	1.530	2.06c	1.375	2.46c	13	13	0	1.49c	1.487	2.06c	1.375	1.93c	107
Standard rails	\$48.99	5	15	0	2.46c	13	13	0	1	1.49c	1.487	2.06c	1.375	2.55c	14	3	0	1.95c	1.951	2.42c	1.610	2.25c	127
Merchant bars	2.66c	11	15	0	2.77c	7	6	0	3.49c	10	17	6	3	3.83c	21	5	0	2.34c	2.340	3.85c	2.000	3.11c	173	
Structural shapes	2.48c	13	15	0	2.83c	7	9	0	4.07c	22	12	6	3.59c	4.07c	22	12	6	3.59c	3.599	4.80c	3.200	6.60c	370	
Plates, ½ in. or 5 mm.	2.68c	14	17	6	3.53c	9	6	0	3.83c	21	5	0	2.34c	2.340	3.00c	2.000	3.11c	2.48c	1.650	2.29c	127			
Plates, black, 24 gage or 0.5 mm.	3.40c	18	17	6	2.98c	7	17	0	2.91c	16	3	6	1	2.55c	14	3	0	1.71c	1.713	2.48c	1.650	2.29c	127	
Sheets, gal., 24 ga., corr.	3.98c	22	2	6	3.94c	10	7	6	2.91c	16	3	6	1	2.55c	14	3	0	1.71c	1.713	2.48c	1.650	2.29c	127	
Bands and strips	....	....	....	....	2.76c	7	5	0	2.91c	16	3	6	1	2.55c	14	3	0	1.71c	1.713	2.48c	1.650	2.29c	127
Plain wire, base	....	....	....	....	3.15c	5	6	3	2.91c	16	3	6	1	2.55c	14	3	0	1.71c	1.713	2.48c	1.650	2.29c	127
Galvanized wire, base	....	....	....	....	3.75c	9	17	6	2.91c	16	3	6	1	2.55c	14	3	0	1.71c	1.713	2.48c	1.650	2.29c	127
Wire nails, base	....	....	....	....	3.56c	9	7	6	2.91c	16	3	6	1	2.55c	14	3	0	1.71c	1.713	2.48c	1.650	2.29c	127
Tin plate, box 108 lbs.	\$ 5.61	1	7	9	....	....	....	....	2.91c	16	3	6	1	2.55c	14	3	0	1.71c	1.713	2.48c	1.650	2.29c	127

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

†British ship-plates. Continental, bridge plates. †24 ga. †1 to 3 mm. basic price.
 British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel.
 (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed.
 ††Rebate of 15s oz certain conditions.
 **Gold pound sterling not quoted. ††No quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	18.00
Bos. dock No. 1 exp.	16.75-17.00
New Eng. del. No. 1	17.00-17.50
Buffalo, No. 1	20.00-20.50
Buffalo, No. 2	18.00-18.50
Chicago, No. 1	20.00-20.50
Chicago, auto, no alloy	19.50-20.00
Cincinnati, dealers	16.75-17.25
Cleveland, No. 1	19.50-20.00
Cleveland, No. 2	18.50-19.00
Detroit, No. 1	†16.50-17.00
Detroit, No. 2	†15.50-16.00
Eastern Pa., No. 1	20.50-21.00
Eastern Pa., No. 2	19.50-20.00
Federal, Ill., No. 2	16.00-16.50
Granite City, R. R. No. 1	16.75-17.25
Granite City, No. 2	15.75-16.25
Los Ang., No. 1 net	13.50-14.00
Los Ang., No. 2, net	12.50-13.00
N. Y. dock No. 1 exp.	†17.00
Pitts., No. 1 (R. R.)	22.00-22.50
Pittsburgh, No. 1	20.50-21.00
Pittsburgh, No. 2	19.50-20.00
St. Louis, No. 1	17.00-17.50
St. Louis, No. 2	15.75-16.25
San Fran., No. 1 net	13.50-14.00
San Fran., No. 2, net	12.50-13.00
Seattle, No. 1	15.00
Toronto, (dtrs., No. 1)	11.00
Valleys, No. 1	20.50-21.00

COMPRESSED SHEETS

Buffalo, hydraulic compressed sheets	18.00-18.50
Chicago, factory	19.50-20.00
Chicago, dealers	16.75-17.25
Cincinnati, dealers	15.75-16.25
Cleveland	19.00-19.50
Detroit	†18.00-18.50
E. Pa., new mat.	21.00
E. Pa., old mat.	17.50-18.00
Los Angeles, net	10.00-10.50
Pittsburgh	20.50-21.00
St. Louis	13.50-14.00
San Francisco, net.	10.00-10.50
Valleys	19.00-19.50

BUNDLED SHEETS

Buffalo, No. 1	18.00-18.50
Buffalo, No. 2	16.50-17.00
Cleveland	14.50-15.00
Pittsburgh	19.50-20.00
St. Louis	12.50-13.00
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	13.50-14.00
Cincinnati, dealers	11.25-11.75
Detroit	†14.50-15.00
St. Louis	11.50-12.00
Toronto, dealers	9.00

BUSHING

Birmingham, No. 1.	14.50
Buffalo, No. 1	18.00-18.50
Chicago, No. 1	18.75-19.25
Cincin., No. 1 deal.	12.75-13.25
Cincin., No. 2 deal.	7.00-7.50
Cleveland, No. 2	13.50-14.00
Detroit, No. 1 new	†17.50-18.00
Valleys, new, No. 1	19.00-19.50
Toronto, dealers	5.50-6.00

MACHINE TURNINGS (Long)

Birmingham	7.50
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Buffalo	13.50-14.00
Chicago	12.50-13.00
Cincinnati, dealers	9.50-10.00
Cleveland, no alloy	13.00-13.50
Detroit	†10.00-10.50
Eastern Pa.	14.50
Los Angeles	4.00-5.00
New York	†9.00-9.50
Pittsburgh	16.00-16.50
St. Louis	10.50-11.00
San Francisco	5.00
Toronto, dealers	7.00-7.25
Valleys	13.50-14.00

SHOVELING TURNINGS

Buffalo	14.50-15.00
Cleveland	13.50-14.00
Chicago	13.75-14.25
Chicago, spcl, anal.	15.00-15.50
Detroit	†12.25-12.50
Pitts., alloy-free	17.00-17.50

BORINGS AND TURNINGS

<i>For Blast Furnace Use</i>	
Boston district	†7.25-7.50
Buffalo	13.00-13.50
Cincinnati, dealers	7.75-8.25
Cleveland	13.50-14.00
Eastern Pa.	13.00-13.50
Detroit	†12.00-12.50
New York	†8.75-9.00
Pittsburgh	14.00-14.50
Toronto, dealers	6.75

AXLE TURNINGS

Buffalo	16.00-16.50
Boston district	†12.00-12.50
Chicago, elec. fur.	18.00-18.50
East. Pa. elec. fur.	17.50-18.00
St. Louis	13.50-14.00
Toronto	6.00-6.50

CAST IRON BORINGS

Birmingham	8.50
Boston dist. chem.	†9.50-9.75
Buffalo	13.00-13.50
Chicago	13.50-14.00
Cincinnati, dealers	7.75-8.25
Cleveland	13.50-14.00
Detroit	†12.00-12.50
E. Pa., chemical	14.50-15.00
New York	†8.75-9.00
St. Louis	10.00-10.50
Toronto, dealers	6.75

RAILROAD SPECIALTIES

Chicago	21.75-22.25
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ANGLE BARS—STEEL

Chicago	22.50-23.00
St. Louis	20.00-20.50

SPRINGS

Buffalo	24.00-24.50
Chicago, coll	23.50-22.00
Chicago, leaf	22.50-23.00
Eastern Pa.	24.50-25.00
Pittsburgh	26.50-27.00
St. Louis	21.50-22.00

STEEL RAILS, SHORT

Birmingham	19.50
Buffalo	24.00-24.50
Chicago (3 ft.)	22.00-22.50
Chicago (2 ft.)	23.00-23.50
Cincinnati, dealers	23.50-24.00
Detroit	†23.00-23.50
Pitts., 3 ft. and less	26.00-26.50
St. L. 2 ft. & less.	23.75-24.25

STEEL RAILS, SCRAP

Birmingham	17.00
Boston district	†14.50-15.00

Buffalo	22.00-22.50
Chicago	19.75-20.25
Cleveland	22.50-23.00
Pittsburgh	23.50-24.00
St. Louis	20.00-20.50
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net	13.00-13.50
Cincinnati, dealers	12.50-13.00

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	14.00-14.50
Cincinnati, dealers	12.00-12.50
Eastern Pa.	18.00
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	14.00-14.50
St. Louis, No. 2	16.50-17.00

FORGE FLASHINGS

Boston district	†12.00-12.25
Buffalo	18.00-18.50
Cleveland	18.50-19.00
Detroit	†16.50-17.00
Pittsburgh	19.00-19.50

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	23.25-23.75

LOW PHOSPHORUS

Cleveland, crops	23.00-23.50
Eastern Pa., crops	25.00-25.50
Pitts., billet, bloom, slab crops	27.00-27.50

LOW PHOS. PUNCHINGS

Buffalo	23.50-24.00
Chicago	22.75-23.25
Cleveland	21.00-21.50
Eastern Pa.	25.00-25.50
Pittsburgh	26.00-26.50
Seattle	15.00
Detroit	†20.00-20.50

RAILS FOR ROLLING

<i>5 feet and over</i>	
Birmingham	20.00
Boston	†15.75-16.00
Chicago	22.50-23.00
New York	†18.00-18.50
Eastern Pa.	23.50
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	18.75-19.25

SHAFTING

Boston district	†19.00-19.25
New York	†19.00-19.50

Eastern Pa.	25.00-25.50
St. Louis, 1 1/4-3 3/4"	19.00-19.50

CAR WHEELS

Birmingham, iron	15.00
Boston dist, iron	†15.25-15.50
Buffalo, steel	24.00-24.50
Chicago, iron	20.00-20.50
Chicago, rolled steel	23.75-24.25
Cincin., iron deal.	20.00-20.50
Eastern Pa., iron	21.50-22.00
Eastern Pa., steel	24.50-25.00
Pittsburgh, iron	21.00-21.50
Pittsburgh, steel	26.50-27.00
St. Louis, iron	19.25-19.75
St. Louis, steel	20.50-21.00

NO. 1 CAST SCRAP

Birmingham	17.00
Boston, No. 1 mach.	†15.75-16.25
N. Eng. del. No. 2	15.25-15.75
N. Eng. del. textile	19.50-20.00
Buffalo, cupola	18.50-19.00
Buffalo, mach.	20.00-20.50
Chicago, agri. net.	15.50-16.00
Chicago, auto net.	18.25-18.75
Chicago, rail'd net	16.50-17.00
Chicago, mach. net.	17.00-17.50
Cincin., mach. deal.	20.50-21.00
Cleveland, mach.	21.75-22.25
Detroit, cupola, net	†17.00-17.50
Eastern Pa., cupola	22.00-22.50
E. Pa., No. 2 yard.	18.50-19.00
E. Pa., yard fdry.	19.00-19.50
Los Angeles	16.50-17.00
Pittsburgh, cupola	19.50-20.00
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	18.75-19.25
St. L., No. 1 mach.	19.00-19.50
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break	†15.25-15.50
New England, del.	16.25-16.75
Buffalo, break	17.50-18.00
Cleveland, break, net	16.50-17.00
Detroit, auto net.	†17.25-17.75
Detroit, break	†15.00-15.50
Eastern Pa.	21.00
Los Ang., auto, net.	13.00-14.00
New York break	†16.00-16.50
Pittsburgh, break	16.50-17.00

STOVE PLATE

Birmingham	10.00-11.00
Boston district	†11.50-11.75
Buffalo	16.50-17.00
Chicago, net	13.00-13.50
Cincinnati, dealers	12.50-13.00
Detroit, net	†12.00-12.50
Eastern Pa.	17.50
New York fdry	†13.00
St. Louis	†13.50-14.00
Toronto dealers, net	12.00

MALLEABLE

New England, del.	22.00-23.00
Buffalo	22.50-23.00
Chicago, R. R.	22.00-22.50
Cincin. agri., deal.	17.75-18.25
Cleveland, rail.	22.50-23.00
Eastern Pa., R. R.	22.50-23.00
Los Angeles	12.50
Pittsburgh, rail.	24.50-25.00
St. Louis, R. R.	20.00-20.50

Manganese Ore

<i>Including war risk but not duty, cents per unit cargo lots.</i>	
Caucasian, 50-52%	60.00
So. African, 50-52%	58.00-59.00
Indian, 49-50%	56.00
Brazilian, 46%	50.00-53.00
Cuban, 50-51%, duty free	71.00-73.00

Molybdenum

Sulphide conc., lb.	
Mo. cont., mines	\$0.75

Ores

Lake Superior Iron Ore

Gross ton, 51 1/4 % Lower Lake Ports	
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Old range bessemer	\$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract.	10.00
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Foreign Ore

<i>Cents per unit, c.i.f. Atlantic ports</i>	
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

Sheets, Strip

Sheet & Strip Prices, Pages 70, 71

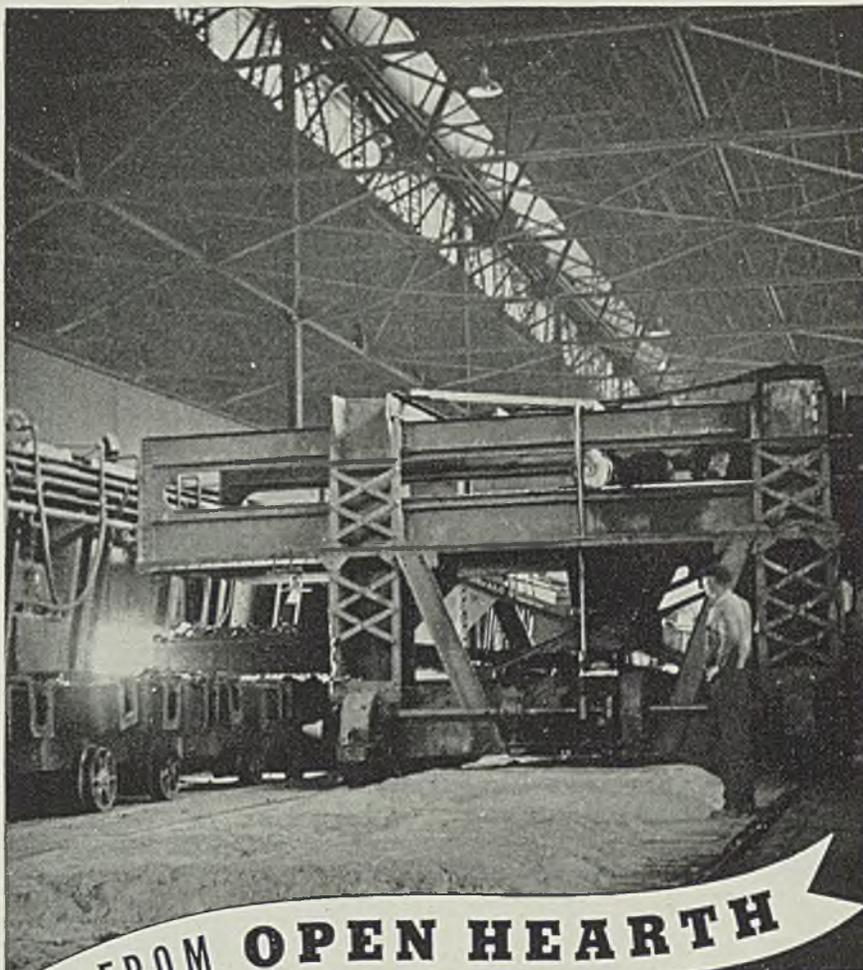
Pittsburgh — Shipments during September have been the heaviest of any month this year, principally because of the clean-up of low priced material. New orders have been fairly good, although it is probable September bookings did not equal August, because automotive buying has been somewhat less. Galvanized sheet production held steady last week at 76 per cent of capacity, with general sheet production running at about the same figure. H. H. Robertson Co., heretofore fabricators, have decided to galvanize sheets for their own use hereafter.

Cleveland—Sheet deliveries have been stimulated the past month by the movement of low-priced tonnage, although consumption is expanding and in many cases users will have increased their stocks less than was anticipated a few weeks ago. Mill backlogs are less extended than is true of heavier products, though unfilled orders are increasing. Automotive requirements continue an important factor in demand, but needs of miscellaneous users are broadening.

Chicago — Sheet backlogs continue to grow even if automotive specifications currently appear slower. Other consumers, such as stampers, toymakers and other users of lighter steel continue to press for deliveries. Mills rolling narrow strip have one to three weeks' work ahead, and wider strip and sheet producers one to two weeks ahead. Galvanized sheets are booked up to six to seven weeks.

Boston—Cold-rolled strip orders are more numerous. Tonnage is being added to backlogs despite re-rolling operations above 90 per cent, with shipments heavy. September buying is slightly ahead of August with consumers inclined to more forward buying. Little tonnage is being booked for delivery after Dec. 31, but it is admitted mills will be hard pushed to ship all fourth quarter bookings before that date in view of the continued substantial flow of new business. Deliveries on the more standard finishes range from four to five weeks with specialties, requiring annealing and special processing, eight to ten weeks.

New York—Sheet sellers generally declare they will have shipments on bargain tonnage well cleaned up by the end of this month. The movement over the past several days has been particularly heavy, and with all indications that September shipments will be the heaviest this year for most sellers. Meanwhile consumption is expand-



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STANDARD STEEL WORKS

Division of THE BALDWIN LOCOMOTIVE WORKS
P H I L A D E L P H I A

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THE BALDWIN
GROUP



ing and coverage by consumers of low priced material will not extend as far as many believed a month ago. Deliveries are being generally extended and while four to five weeks can still be done on both hot and cold-rolled sheets, the average is nearer the outside. Certain leading sellers, in fact, can now do little under six weeks.

Philadelphia—While sheet consumers are taking heavy tonnages against bargain contracts, delivery deadline Sept. 30, the material will not cover as long as expected, because of expanding defense orders. It is believed substantially larger tonnages will be required for fourth quarter.

Buffalo — Specifications are increasing at such a pace that deliveries of sheets and strip may extend beyond the month or so now in effect. Indications are seen of some consuming sources building up inventories for pending defense orders.

Cincinnati—More sheet users are pressing for deliveries, although delays so far have not been serious. Mills are near capacity, with buying gradually building up fourth quarter backlogs. Greatest improvement is in automotive demand. Export needs, far below late 1939, are steady. Some domestic consumers are building protective inventories.

St. Louis—Sheet mill operations are maintained at the recent high rate, and owing to heavy specifications and a good volume of new business, deliveries on certain items are reported on a four to five week basis. Prices are firm and any orders for next year are at full quoted prices.

Plates

Plate Prices, Page 70

Pittsburgh—New business over the past week in heavy plates was somewhat lighter, although considerable tonnage of armor plate in varying thicknesses is reported about to be placed by recipients of defense orders. Government sources indicate large placements will be made shortly and some prospective builders of motorized equipment are figuring plate needs for early specifying. Backlogs are still high and delivery rates far in the future.

Cleveland—Plate backlogs are sustained, and unfilled orders in heavier gages are being increased. Delivery of two to three weeks can be made on narrow plates in the lighter gages but on heavier and wider sections shipment of four to six weeks is necessary. Business is coming from

many sources, including some railroad orders for car building and repairs.

Boston—Plate orders and specifications continue at a good rate, buying in less-than-car lots being accompanied by pressure for deliveries which are gradually being extended on wider plates, heads, flanged material and in some instances quality and alloy plates.

Low bid of 2.10c, delivered Boston and Portsmouth, N. H., was submitted by Otis Steel Co., Cleveland, on plate tonnage for delivery to those yards included in the navy department opening, covering close to 85,000 tons of plates, shapes, bars, sheets and strip. The same price was submitted for sheets and strip.

New York—The plate market is increasingly active, with building requirements in a notable spurt and heavier demands from railroads and railroad equipment builders. Potential demand for armament work is broadening rapidly.

Philadelphia — Plate specifications continue active and fairly early deliveries continue, light plates being available in ten days in some cases and heavy plates of ordinary widths in three to four weeks. On heavy wide plates shipments are considerably more extended as a rule.

Birmingham, Ala. — Plate production probably is at an alltime high. New business is coming in great volume, and output is at capacity. Backlogs are accumulating.

Toronto, Ont.—Additional plate demand is appearing and orders for some 10,000 tons are said to be pending. This business, however, will have no effect on Canadian production as it is expected to go entirely to the United States. Most of this new demand is directly associated with war work, although there are about 1000 tons for other requirements.

Plate Contracts Placed

18,000 tons, 20 destroyers, to Seattle-Tacoma Shipbuilding Corp., Tacoma, Wash.

16,200 tons, 18 destroyers, Union plant, San Francisco, to Bethlehem Shipbuilding Corp., San Francisco.

14,400 tons, four cruisers, Union plant, San Francisco, to Bethlehem Shipbuilding Corp., San Francisco.

5400 tons, 6 destroyers, to Bethlehem Shipbuilding Corp., San Pedro, Calif.

1320 tons, 11 lighters, schedule 2764, navy department, to Western Pipe & Steel Co., San Francisco.

1280 tons, fabricated high-strength low-alloy steel plates and one lot eyebolts, bolts and screw caps, Panama, schedule 4303, to U. S. Steel Export Co., New York \$146,420, bids Sept. 23, Washington.

900 tons, industrial, 48-inch water supply pipe for Bellingham, Wash., to Steel Tank & Pipe Co., Portland, Ore.

360 tons, 96,000-barrel tank, Richfield

Oil Corp., Providence, R. I., to Bethlehem Steel Co., Bethlehem, Pa.

278 tons, 4 to 20-inch welded pipe, specification 1409-D, Ogden river project Utah, to Southern Pipe & Casing Co., Azusa, Calif.

160 tons, acid tanks, Monsanto Chemical Co., Josephstown, Pa., to Graver Tank & Mfg. Co. Inc., East Chicago, Ind.

Plate Contracts Pending

9600 tons, four C-3 maritime commission freighters; Seattle-Tacoma Shipbuilding Co., Seattle, general contractor.

8000 tons, ten seaplane tenders for use on west coast; bids opened.

600 tons, 229-foot coast geodetic survey boat for use in Alaska waters; Lake Washington Shipyards, Houghton, Wash., low at \$1,219,000.

200 tons or more, 51 1/2-inch water pipe, Seattle, Wash.; bids Oct. 3.

100 tons or more, two barges for army and navy; Associated Shipbuilders, Seattle, general contractor.

Unstated tonnage, car float, bureau of supplies and accounts (ships), Washington, schedule 2909, J. K. Welding Co., Brooklyn, low, \$39,800 and \$40,500.

Bars

Bar Prices, Page 70

Pittsburgh—Merchant bar tonnage placed over the past week was at about the same volume as the preceding week and September winds up on about the same level as August. There has been a slight gain in merchant bar buying in small quantities, with warehouse sellers reporting considerable number of new inquiries. Export business also has picked up.

Cleveland—Orders are heavy and mill backlogs are extended further, as reflected in an extension of deliveries. Shipments vary widely, with longest delays prevailing on larger sizes which are rolled infrequently. On more popular sizes, as well as on small shapes, deliveries range from three to five weeks. Producers are heavily booked on electric furnace grades, unfilled orders in some instances assuring heavy production into next year.

Chicago — Buying of steel bars and small structurals is somewhat lighter. Automotive buyers have been slow in placing forward specifications but this is considered rather seasonal. Forging companies are said to have six weeks' work ahead, and heavy machinery builders continue busy.

Boston — While heavier consumers of bars, notably alloys, have extended coverage, buying is maintained by increased demand for defense program fabricated products.

New York — Hot carbon and cold-drawn bar deliveries average around five weeks although recently shipment within two to three weeks was quoted on 1900 tons of cold drawn bars for an eastern arsenal.

Alloy bar shipments average around eight weeks, and where they are especially treated, 12 to 15 weeks.

Philadelphia—Heavy specifications from machine tool builders and forgers are being augmented by expanding bar requirements in other directions. Edward G. Budd Mfg. Co. is expected to distribute 10,000 tons of bars for two contracts for 1,345,000 bombs. Arsenals and other direct government agencies are increasingly active. Railroads are figuring heavier tonnages. While bar deliveries are being extended producers are trying to work in munitions requirements promptly, some recent tonnages being quoted at ten days or less.

Pipe

Pipe Prices, Page 71

Pittsburgh—Tubular goods demand destined for oil country service is unchanged. Line pipe also is slow, although shipments of line pipe on orders placed earlier have been fairly good. Standard pipe continues the backbone of the present pipe market, largely from construction work. Mechanical tubing and pressure tubing also are moving fairly well.

Boston—Irregular improvement in merchant steel pipe buying continues, secondary distributors moving slightly more material for plumbing, heating and general construction. Mill releases and shipments are light. Prices for replacements are firmer, likely to influence resale quotations to a greater extent next quarter. Cast pipe buying and releases are irregular.

New York—Sharp increase in cast pipe inquiry and buying is partially due to requirements for water line extensions at army cantonments and training posts. For Camp Dix, N. J., 2200 tons, 12-inch and under, has been placed, with 1500 tons going to Camp Edwards, Falmouth, Mass., these being supplemented by fair-sized tonnages to other stations. Export demand is sustained and a recent additional purchase for Panama includes 2000 tons placed with the U. S. Pipe & Foundry Co. Utility releases against contracts are substantial. Deliveries are from three to eight weeks, depending on size.

Philadelphia—Edward G. Budd Mfg. Co. is placing orders for 1870 tons of tubing for government bomb contracts, one lot of 470 tons and another for 1400 tons, for 1,345,000 bombs.

Seattle—Through Amtorg Trading Co. Russian interests are taking between 35,000 and 40,000 tons of 12-inch steel oil pipe, in 35

and 45-foot lengths. This material is coming from three unstated mills in the Pittsburgh district and is being shipped to Vladivostok through Seattle on Russian freighters. Destination of the pipe is not disclosed.

Birmingham, Ala.— Pipe plants are on a five-day week. Demand is scattered and in relatively small lots, but large in the aggregate.

Cast Pipe Placed

2200 tons, cement-lined, Panama, schedule 4294, included at \$86,430, bids Sept.

9, to U. S. Pipe & Foundry Co., Burlington, N. J.

400 tons, cement-lined, Panama, schedule 4294, to American Cast Iron Pipe Co., Birmingham; Crane Co. awarded 277,000 feet, galvanized carbon steel pipe, small sizes, same schedule, \$45,115.40.

Steel Pipe Placed

1915 tons, pipe piling, building 77, navy yard, Brooklyn, N. Y., to American Rolling Mill Co., Middletown, O.

775 tons, subway, route 110, section 10, Brooklyn, to Alco Products Co., Dunkirk, N. Y.; George A. Flinn Corp., New York, contractor.

Unstated tonnage, 37,000 feet, steel pipe, quartermaster supplies, Washington, to

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LUBRICANTS FOR THE STEEL INDUSTRY SINCE 1885

Crane Co., Washington, \$102,689.80. bids Sept. 7; 200 tons, cast iron pipe to American Cast Iron Pipe Co., Birmingham, Ala.

Unstated tonnage, 600 lengths, 16-foot, 8 inches each, 20-inch i.d. shore discharge pipe, U. S. engineer, Philadelphia, to Lancaster Iron Works, Lancaster, Pa.; bids Sept. 24, Inv. 71.

Cast Pipe Pending

500 tons, 16-inch, cement-lined, Panama, sch. 4378, bids Oct. 3, Washington.

480 tons, 30-inch, cement-lined, Panama, sch. 4377, bids Oct. 7, Washington.

450 tons, 8 and 12-inch pipe, hydrants, etc., West Myrtle street extension, Seattle; bids probably in November.

400 tons, small sizes, class B, Providence, R. I.; readvertised.

Steel Pipe Pending

Unstated tonnage, copper-nickel alloy tubing, navy yard, Mare Island, Calif., schedule 3004; American Brass Co., Waterbury, low, \$282,636.25, delivered.

Rails, Cars

Track Material Prices, Page 71

With 7985 freight cars placed by domestic lines over the past few days, total buying so far this month involves 9735 units, which exceeds that for any full month so far this year, surpassing the August total of 7525.

This month will probably not prove as active as a year ago, when 23,000 cars were placed. However, buying this month has been sufficient to bring the total for the year to date to 39,297 cars, exceeding the 35,456-car aggregate for the first nine months of 1939, which included the heavy total of last September.

Chicago, Rock Island & Pacific has been authorized by the interstate commerce commission to issue \$2,460,000 of equipment trust certificates in connection with the purchase of equipment.

Car Orders Placed

Duluth, Mesabi & Iron Range, 30 ballast and 10 covered hoppers, to American Car & Foundry Co., New York.

Louisville & Nashville, 500 fifty-ton hoppers to Pullman-Standard Car Mfg. Co., Chicago.

Norfolk & Western, 1000 fifty-five ton gondola cars, 500 to Virginia Bridge Co., Roanoke, Va., and 500 to Ralston Steel Car Co., Columbus, O.

Pere Marquette, 600 cars; 200 fifty-ton box cars to American Car & Foundry Co., St. Louis shops; 150 fifty-ton box cars to General American Transportation Corp., Chicago; 150 fifty-ton box cars to Pullman-Standard Car Mfg. Co., Michigan City, Ind.; 100 fifty-ton auto-furniture cars to Greenville Steel Car Co., Greenville, Pa.

Pennsylvania, three stainless steel passenger coaches, to Edward G. Budd Mfg. Co., Philadelphia.

Reading Co., 1000 fifty-ton hopper cars and 50 steel caboose cars, to own shops at Reading, Pa.; also conversion of

16 compound mallet engines to simple engines, at cost of approximately \$375,000.

Seaboard Airline, in conjunction with Pennsylvania, 18 stainless steel coaches, comprising 10 luxury passenger cars, three tavern-observation cars, three passenger-baggage-dormitory cars and two dining-lounge cars.

Soo Line, 500 hoppers to Pullman-Standard Car Mfg. Co., Chicago.

Southern Railway, 3230 cars; 1500 box cars to Pullman-Standard Car Mfg. Co., Chicago; 730 high-side gondolas to American Car & Foundry Co., New York; 250 low-side gondolas to Mount Vernon Car Mfg. Co., Mt. Vernon, Ill.; 750 hoppers to Pressed Steel Car Co., Pittsburgh.

Tennessee Central, 65 hoppers, to Pullman-Standard Car Mfg. Co., Chicago.

Union Pacific, 1000 Hart ballast cars to American Car & Foundry Co., New York.

Car Orders Pending

Baltimore & Ohio, 750 fifty-five-foot 6-inch gondolas and 250 sixty-five-foot gondolas; bids asked.

Bureau of Supplies and Accounts, navy dept. Philadelphia delivery, three 50-ton box and five steel underframe 50-ton flat cars, bids Oct. 4, sch. 3316.

Pere Marquette, 200 seventy-ton mill-type gondolas, contemplated; in addition to 600 freight cars recently distributed.

Union Pacific, 2000 box cars; bids asked.

Locomotives Placed

Chesapeake & Ohio, 10 mallet locomotives of the 2-6-6-6 type, to Lima Locomotive Works, Lima, O.

United States navy, one diesel-electric locomotive, to General Electric Co., Schenectady, N. Y.

Locomotives Pending

Northern Pacific, 14 steam and six diesel-electric; bids asked.

Rail Orders Placed

Louisville & Nashville, 31,000 tons, to Tennessee Coal, Iron & Railroad Co.; includes 24,000 tons of 100-pound and 7000 tons of 131-pound.

Virginian, 10,000 tons; 8000 tons to Bethlehem Steel Co., Bethlehem, Pa., 2000 tons to Carnegie-Illinois Steel Corp., Pittsburgh.

Rail Orders Pending

Northern Pacific, 35,000 tons; bids asked.

Southern Pacific, 60,000 tons; bids asked.

Wire

Wire Prices, Page 71

Pittsburgh — Manufacturers' wire bookings during September were better than August and are climbing slowly. Releases from automotive builders are at the same volume, while in the merchant wire market construction items are moving well and a slight increase is noticeable in agricultural markets. Wire rope demand is also somewhat better.

Barbed wire is being produced at capacity.

Boston—Incoming wire orders are heavy, with scattered gains in new tonnage covering a broader range of products. Finishing operations, practically at capacity in some departments for weeks, are higher on several products which have lagged slightly up to now. September volume will top the previous month by 20 per cent with most mills.

Philadelphia—A New Jersey mill has booked 14,000 kegs of nails for Camp Dix, N. J., for delivery in five days.

Birmingham, Ala.—Wire demand, while somewhat off from peak periods, is consistent. Most items are moving in satisfactory volume, and inventories are not considered excessive.

Washington — Continental Steel Corp., Kokomo, Ind., is low on approximately 1000 tons, common wire nails, under schedule 64, United States engineers, for delivery at various points, bidding \$33,148 on the bulk, or largest items, and a total of \$55,464.22.

Shapes

Structural Shape Prices, Page 70

Cleveland—Structural shape deliveries are extended six to eight weeks and larger fabricators are attempting to build up stocks of standard sections. Delivery is an important factor in placing of construction work and fabricators are interested in maintaining better supplies. Orders continue heavy and mill backlogs show no reduction.

Chicago — Mill orders for shapes are on a lower scale this week than last, but still are considered fairly satisfactory. Many of the orders are for less than 100 tons each. City fabricators have not been getting much government work, but expect to obtain a better share later.

Philadelphia — Most fabricators have backlogs for at least three months and delivery is expected to become more extended, as much work is in prospect. Recent bookings have been fairly light.

American Institute of Steel Construction reports August bookings of structural steel at 109,918 tons, compared with 189,870 tons in July and 100,849 tons in August last year. Shipments in August were 124,301 tons, in July 121,315 tons and in August last year 139,680 tons. Aggregate bookings for eight months were 919,019 tons, compared with 881,152 in the same period, 1939. Shipments for eight months were 900,628 tons, compared with 920,980 tons.

Toronto, Ont.—Business continues

brisk in structural steel with approximately 25,000 tons pending. Most current demand is traced directly back to war construction.

St. Louis—Interest in structurals here centers in 4000 to 5000 tons for a bridge over the Mississippi river at Chester, Ill., the general contract for which has been let to the Massman Construction Co., Kansas City, Mo. A number of small jobs recently have made a fair aggregate, and fabricating yard operations are maintained at 40 to 50 per cent of capacity.

Shape Contracts Placed

- 12,000 tons, 20 destroyers for navy to Seattle-Tacoma Shipbuilding Corp., Tacoma, Wash.
- 10,800 tons, 18 destroyers for navy to Bethlehem Shipbuilding Corp., San Francisco.
- 9600 tons, four cruisers for navy to Bethlehem Shipbuilding Corp., San Francisco.
- 9000 tons, aircraft engine plant, Ford Motor Co., Detroit, to American Bridge Co., Pittsburgh; contract for driving 4000 tons of pipe piling to A. J. Du Puis Co., Detroit. Order for piling still pending. Plant to be completed by early January.
- 6210 tons, ordnance plant (powder), E. I. du Pont de Nemours & Co., Charlestown, Ind., to Virginia Bridge Co., Roanoke, Va.
- 5000 tons, grade crossing elimination, section 5, contract 4, Long Island railroad, Atlantic avenue, Brooklyn, to American Bridge Co., Pittsburgh; Arthur A. Johnson Corp., New York, contractor.
- 4550 tons, air corps hangar and repair shop, Mobile, Ala., to Ingalls Iron Works, Birmingham, Ala.; A. J. Rife Construction Co., Dallas, Tex., contractor, \$1,345,000; bids Aug. 29, Mobile, Ala.
- 3600 tons, six destroyers for navy to Bethlehem Shipbuilding Corp., San Pedro, Calif.
- 3500 tons, addition to gun assembly shop, navy yard, Washington, to Bethlehem Steel Co., Bethlehem, Pa., through Skolnick Building Corp., New York.
- 2800 tons, floating steel dry dock, 482 x 71 feet, for navy yard, Mare Island, Calif., to Pacific Bridge Co., Portland, Ore., \$1,649,000; spec. 9950, bids Sept. 18, bureau of yards and docks, Washington.
- 2500 tons, windowless airplane factory, 400,000 square feet floor space, Grumman Aircraft Engineering Corp., Beth-

- page, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.; Austin Co., Cleveland, contractor.
- 1500 tons, extensions to machine shop, for Mesta Machine Co., Homestead, Pa., to Bethlehem Steel Co., Bethlehem, Pa.
- 1500 tons, sheet piling, Dow Chemical Co. addition, Freeport, Tex., to Carnegie-Illinois Steel Corp., Pittsburgh; Austin Company, Cleveland, contractor.
- 1450 tons, land plane hangar for navy, San Diego, Calif., H. M. Golden, general contractor, to Bethlehem Steel Co., Los Angeles.
- 1400 tons, foundry and shipping buildings, for Wright Aeronautical Corp., Paterson, N. J., to Truscon Steel Co., Youngstown, O.

- 1300 tons, additional, ship repair vessels for navy, to Los Angeles Shipbuilding Co., Los Angeles.
- 1100 tons, addition to warehouse, for Westinghouse Electric & Mfg. Co., Mansfield, O., to Bethlehem Steel Co., Bethlehem, Pa.
- 975 tons, bureau of reclamation, three bridges, Kettle Falls, Wash., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 850 tons, 3-story pipe and copper shop and mold loft, Mariners Harbor shipbuilding plant, Bethlehem Steel Co., Staten Island, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.
- 825 tons, offices and factory buildings, aeroproducts division, Argonaut Realty



FRUEHAUF FOTO

Down comes the brake on these ARMCO ZINCGRIP-PAINTGRIP sheets. There is no cracking, no flaking, no peeling of the galvanized metal. And out come sturdy roof panels for streamlined truck trailers.

Next the bonderized surface of ARMCO ZINCGRIP-PAINTGRIP comes into play. This special mill finish permits immediate painting in any color. Shop costs go down and stay down. No need for etching; no loss of the protective zinc coating.

Once out of the shop, tops and bodies made of ARMCO

ZINCGRIP-PAINTGRIP ring the bell to easier trailer sales and more satisfied customers. Protected by the tightly adherent ZINCGRIP coating, these roof panels really take the weather. Seams resist rust inside and out. Paint jobs look better, last longer.

Maybe your products and your sales will thrive on ARMCO ZINCGRIP-PAINTGRIP sheets. Why not talk it over with an experienced ARMCO man? Just write The American Rolling Mill Co., 2530 Curtis Street, Middletown, Ohio.

Shape Awards Compared

	Tons
Week ended Sept. 28.....	91,266
Week ended Sept. 21.....	81,811
Week ended Sept. 14.....	42,360
This week, 1939	24,224
Weekly average, year, 1940.	26,094
Weekly average, 1939	22,411
Weekly average, August....	29,403
Total to date, 1939	885,523
Total to date, 1940	1,017,674

Includes awards of 100 tons or more.



ARMCO ZINCGRIP-PAINTGRIP Sheets

Co., Vandalia, O., to Burger Iron Co., Akron, O.

720 tons, extensions, shipbuilding ways, navy yard, Portsmouth, N. H., to Pittsburgh-Des Moines Steel Co., Pittsburgh; Aberthaw Co., Boston, contractor.

650 tons, warehouse, arsenal, Edgewood, Md., to Belmont Iron Works, Eddy-stone, Pa.

615 tons, bridge No. 360.86, Nickel Plate system, Cowden, Ill., to American Bridge Co., Pittsburgh.

610 tons, shop and office buildings, AC Spark Plug Co., Flint, Mich., to Whitehead & Kales Co., Detroit.

510 tons, miscellaneous buildings, Aberdeen proving grounds, Maryland, to

Pittsburgh-Des Moines Steel Co., Pittsburgh.

500 tons, addition, parts and service building, Chevrolet Motor Co., Flint, Mich., to Whitehead & Kales Co., Detroit.

500 tons, accessories and overhaul shop, San Diego, Calif., for navy, to American Bridge Co., Pittsburgh.

460 tons, steel piling, addition to Consolidated Aircraft Co., San Diego, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

407 tons, Manitowoc Shipbuilding Co., welding shop, Manitowoc, Wis. to American Bridge Co., Pittsburgh.

380 tons, new plant building, General Chemical Co., near Detroit, to Pitts-

burgh Bridge & Iron Co., Pittsburgh; W. E. Wood Co., Detroit, contractor.

315 tons, theater, Central avenue, Passaic, N. J., to Selbach-Meyer Co., West New York, N. J.

315 tons, state highway bridge, project RC-40-73, Westfield Village, Chautauqua county, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; John B. Schultz Contracting Co. Inc., Buffalo, contractor, \$138,115.52; bids Sept. 4, Albany.

300 tons, plant addition, American Viscose Co., Nitro, W. Va., to Lehigh Structural Steel Co., Allentown, Pa.

275 tons, crane runway extensions, navy yard, Charleston, S. C., to Carolina Steel & Iron Co., Greensboro, N. C.

265 tons, buildings, airport, Orlando, Fla., to Tampa Shipbuilding & Engineering Co., Tampa, Fla.; Watt-Sinclair, West Palm Beach, Fla., contractor; bid to contracting quartermaster, MacDill Field, Fla.

263 tons, addition to post office and federal courthouse, Little Rock, Ark., contractor, Stephens Brown Co., to Arkansas Foundry Co., Little Rock, Ark.

250 tons, additional tonnage, pier extensions, navy yard, Portsmouth, N. H., to Waghorne-Brown Co., Boston, Bethlehem Fabricators Inc., Bethlehem Pa.; Aberthaw Co., Boston, contractor.

250 tons, platform for Louisville Gas & Electric Co., Louisville, Ky., to Louisville Bridge & Iron Co., Louisville.

210 tons, shop addition, New Britain Machine Co., New Britain, Conn., to Berlin Construction Co., Berlin, Conn., through Morton C. Tuttle Co., Boston.

200 tons, steel piling, Oklahoma state highway department, project SAP-1 663-A, Capitol Steel & Iron Co., contractor, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, shop addition, Marlin-Rockwell Co., Jamestown, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, addition to unit 4, Buzzard Point plant, for Potomac Electric Co., Washington, to Fort Pitt Bridge Works, Pittsburgh.

180 tons, underpasses, Kettle Falls, Marcus and Powell, Wash., for bureau of reclamation, to Lakeside Bridge & Steel Co., Milwaukee.

165 tons, including piling, bridge, Canaan-Enfield, N. H., to American Bridge Co., Pittsburgh.

165 tons, bridge B1-67-16-3, Marion, Mich., to Elkhart Bridge & Iron Co., Elkhart, Ind.

165 tons, surgical building, state hospital, Concord, N. H., to Lyons Iron Works, Manchester, N. H., through Davidson Construction Co., Manchester, N. H.

161 tons, steel piling, Hawaiian Dredging Co., to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, office and factory building, for Davis Tool & Engineering Co., Detroit, to Wisconsin Bridge & Iron Co., Milwaukee.

150 tons, two fabricated structural steel struts (without anchor bolts), Panama, schedule 4292, to United States Steel Export Co., New York.

150 tons, state bridges 694, 695, and 766, Caryville, Wis., to Illinois Steel Bridge Co., Jacksonville, Ill.

145 tons, state highway project RC-40-75, Ellenville Village, Ulster county, N. Y., to American Bridge Co., Pittsburgh; Beaver Construction Corp., Albany,

Here's a Tax You Can Cut —the floor hazard tax

Unsafe floors are a source of occupational deaths and injuries for which American industry yearly pays staggering sums. There are claims paid, medical expense, the cost of insurance overhead, and the loss of investment in the time of skilled and specially trained workers.

These expenses are a tax against profits, but fortunately this tax can be materially reduced by making hazardous floors, platforms, runways and stair treads safer with Inland 4-Way Floor Plate.

Whether wet or dry, Inland 4-Way Floor Plate gives full traction in all directions to feet and wheels. It drains readily and it is easily cleaned. Also, it is structurally strong, long wearing and fireproof. Write for the Inland 4-Way Floor Plate Catalog. It will show how you can reduce the floor hazard tax.

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PILING • RAILS • TRACK ACCESSORIES
REINFORCING BARS

INLAND 4-WAY FLOOR PLATE

—The Market Week—

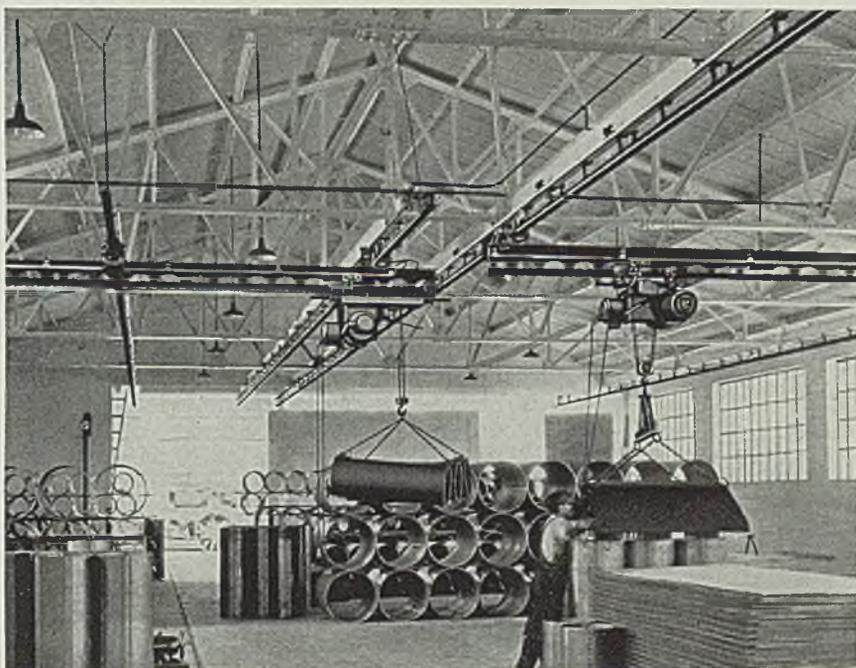
- N. Y., contractor, \$53,338, bids Sept. 4, Albany.
- 140 tons, bridge, proj. 1014-B6, Broadway, Va., to Roanoke Iron & Bridge Works, Roanoke, Va.
- 140 tons, state bridge, contract 2011, Mechanicsburg, Ind., to Midland Structural Steel Co., Cicero, Ill.
- 125 tons, platform shed, Pennsylvania railroad, Wilmington, Del., to Bethlehem Steel Co., Bethlehem, Pa.
- 115 tons, column cores, Vernon boulevard, Queens, N. Y., to Lehigh Structural Steel Co., Allentown, Pa. through procurement division, treasury department, New York.
- 110 tons, new building, Armstrong Furnace Co., Columbus, O., to Truscon Steel Co., Youngstown, O.
- 100 tons, bus terminal, Bergenfield, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa.
- 100 tons or more, 3-story plant addition, Fritzsche Bros. Inc., Clifton, N. J., to Hudson Structural Iron Works, Jersey City, N. J.; J. W. Ferguson Co., Paterson, N. J., contractor.
- 100 tons or more, shop addition, Manning, Maxwell & Moore Inc., Bridgeport, Conn., to New England Iron Works, Boston; Fletcher-Thompson, Inc., Bridgeport, engineers.
- 100 tons, shapes and bars, power house, Heald Machine Co., Worcester, Mass., to United Structural Steel Co., Worcester, and Joseph T. Ryerson & Son Inc., Cambridge, Mass.; E. J. Cross Co. Inc., Worcester, contractor.
- 100 tons, grade crossing elimination, PSC No. 5341, Ontario county, New York, to Genesee Bridge Co., Rochester, N. Y.; Edward Smith Engineering & Constr. Co., Syracuse, N. Y., contractor, \$89,301.50, bids Sept. 4, Albany; bars to Joseph T. Ryerson & Son Inc., New York.

Shape Contracts Pending

- 15,000 tons, viaduct, grade crossing project, contract 5, Long Island railroad, Rockaway Beach, N. Y.; Charles A. Vachris Co., New York, low, bids Sept. 26.
- 4500 tons, contract 67, grade crossing elimination, Atlantic avenue, Brooklyn, N. Y., for Long Island railroad; bids Oct. 8.
- 4000 to 5000 tons bridge over Mississippi river at Chester, Ill.; general contract awarded to Massman Construction Co., Kansas City, Mo., on bid of \$1,089,595.
- 4462 tons, bureau of supplies and accounts, navy department, sch. 900-3755; bids in.
- 4000 tons, engineering shop, invitation 6812-41-17, Hickam Field, T. H.; Robt. McKee, 4700 San Fernando boulevard, Los Angeles, low.
- 1200 tons, 18 warehouses, Edgewood, Md., for government.
- 1050 tons, hangar, Coco Solo, Canal Zone; bids in to Hegman-Harris Co., New York, contractor.
- 1000 tons, state bridge over Mokelumne river, Sacramento, Calif.
- 955 tons, Los Angeles junction railroad bridge, Vernon, Calif.; bids Oct. 15.
- 900 tons, building, for Owens-Illinois Glass Co., Bridgeton, N. J.
- 850 tons, postoffice, Charleston, W. Va.; bids Oct. 16.
- 850 tons, postoffice garage, Boston; Grande & Volpe, Malden, Mass., low, bids Sept. 24, Washington.
- 750 tons, administration building and bachelor quarters, Quonset Point, R. I.

- 717 tons, steel sheet piling, navy yard, Washington; two bidders quoted 2.79c, delivered, schedule 3268.
- 700 tons, transfer bridges, for Pennsylvania railroad, Greenville, N. J.
- 600 tons, warehouse and office building, for Federal Enameling & Stamping Co., McKees Rocks, Pa.
- 500 tons, extension to L street station, for Boston Edison Co., Boston.
- 450 tons, addition to vertical slab plant, for New Jersey Zinc Co., Palmerton, N. J.
- 450 tons, factory addition, Geneva Forge Co., Geneva, N. Y., rebid.
- 450 tons, state of Montana, Glacier Park station, seven 60-foot bridges; bids Sept. 23.

- 350 tons, state bridge, Tuscola county, Michigan.
- 250 tons, state bridge PSC-5998, Gardenville, N. Y.
- 250 tons, plant addition, Celanese Corp., Cumberland, Md.; bids Oct. 11.
- 220 tons, coal bunker, Citizens Gas Co., Indianapolis, Ind.
- 210 tons, three-span beam bridge, Woodford, Vt.; bids Oct. 11.
- 205 tons, intake gate rail support towers, Watts Bar dam, Tennessee Valley Authority, Knoxville, Tenn.; bids Oct. 14.
- 180 tons, state bridges, Saginaw, Mich.
- 177 tons, state of Minnesota, three plate girder spans, Hinckley, Minn.; bids Sept. 30.



UNWIELDY LOADS EASILY HANDLED

It's easy to pick up awkward loads and move them directly to destination with a Cleveland Tramrail overhead materials handling system.

In the metal-working shop illustrated, electric hoists do the heavy lifting, and the light work of propelling the bridges and carriers is done by hand. The Tramrail cranes provide complete coverage for the entire storage room. Easily damaged sheets are handled with speed and safety.

Whatever your requirements, from the simplest hand-propelled equipment to an extensive electrified system, Cleveland Tramrail can serve you.



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CLEVELAND TRAMRAIL

OVERHEAD MATERIALS HANDLING EQUIPMENT

Other products: **CLEVELAND CRANES** and **STEELWELD MACHINERY**

Behind the Scenes with STEEL

Back Home

■ We promised a worm's eye view of the Iron & Steel Engineers' shindig and a worm's eye view it's going to have to be. We just untangled ourselves from all the gadgets in one of the Nickel Plate's new roomettes, and came back to the office to find the desk piled a foot high and a yard wide. When we called up the little woman to let her know her wondering boy had come home, only to have her think it was Mr. Podwojski, the delicatessen, then we knew we were hoarse. There's something about these conventions that always gives us a slight case of double pneumonia, but it was a good show as you have probably already read up front this week.

Asthmatic No. 12

■ Readers 3, 9, and 12 stopped in to say hello and pilfer a pocketful of our matches and we were glad to see them, although No. 12 was new to us and he had us plenty worried for a while. We chewed over the column and the job STEEL is doing and then as he started to leave he apologized profusely for his terrific case of asthma. What a relief, because all the time we thought he was *hissing* us!

Lots To Do And See

■ Of course, even in our weakened condition, we did stir out from STEEL's booth and look around once in a while to see such things as a swell color movie by Cutler-Hammer and an equally good film up in the rooms of Blaw-Knox on their soaking pit cover. We shuttled back and forth between the Ball Room exhibit and the Lower Hall looking over everything from Trabon's new spray nozzle, G. E.'s new width gage, and American Air Filter's new electro-matic air filter to Timken's display of a bearing that had been in on the rolling of over two million tons of steel at Inland. Along with 400 others we knocked off Wednesday and took

a peak at Youngstown Sheet & Tube's Indiana Harbor works which seemed to be slightly on the busy side and somewhere along the line we whirled a waltz at the exhibitors' dance and had a short beer at the United Engineering Bar Mill. It was all great fun but maybe we should have stood in bed. Seven days of such running around does make one weak.

Fun On A Boat

■ And incidentally another affair that was rather severe on one's health was the National Industrial Advertisers' get-together in Detroit week before last. The local Cleveland chapter did things up right and promoted a boat trip across smooth Lake Erie with about 200 on board from all through the middle west. It was quite the gala evening. After dinner the thrilling thespians presented a stirring melodrama, *The Murder in the Advertising Agency*, featuring such lovely characters as G. Howie Hooksum and others. Etaoin, our sleuthing cameraman, snapped the highlight of



the trip however when to her complete surprise Mrs. Charles M. Reese (Cincinnati Milling Machine's adv. mgr.'s attractive better half) was presented with her 30th birthday cake, shown here. It was too big to dunk in that one cup of coffee so we suggested just pouring the coffee on the cake but no one seemed to like the idea.

SIRDLU.

—The Market Week—

- 175 tons, bridge, route 39, sections 1B and 10A, Burlington-Mercer counties, New Jersey; bids Oct. 11, E. Donald Sterner, state highway commissioner, Trenton.
- 165 tons, state bridge, Saltese, Mont.
- 155 tons, processing building, for Procter & Gamble Co., Port Ivory, N. Y.
- 150 tons, state bridge over Wallace river, Snohomish county, Washington.
- 150 tons, state bridge, Hill City, S. Dak.
- 135 tons, state highway bridge, Union county, New Jersey.
- 130 tons, overpass, Chapmans, Pa., for state.
- 120 tons, state bridge over Big Pipe creek, Carroll county, Maryland.
- 115 tons, column cores for warehouse, New York, for treasury department.
- 110 tons, platforms, Grand Coulee power plant, Odair, Wash., for bureau of reclamation.
- 105 tons, bulkhead gate frames and guides, specification 1436-D, Earp, Calif., for bureau of reclamation.
- 100 tons, equipment building Puget Sound navy yard; bids Oct. 4.
- 100 tons, gate frames and guides, Shasta dam project; bids Sept. 30.
- 100 tons, rotor erection platform, Grand Coulee dam, Wash., bids Sept. 30.
- 100 tons, bridge, route 6, sections 8A and 8B, Clifton, N. J.; bids Oct. 11, E. Donald Sterner, state highway commissioner, Trenton.
- Unstated, 760-foot truss span state bridge near Browning, Mont.; bids opened at Helena, Sept. 27.
- Unstated, overhead tracks and other items, Elmendorf Field hangar, Anchorage, Alaska; bids in to army, Fort Mason, Calif.

Reinforcing

Reinforcing Bar Prices, Page 71

Pittsburgh — New business is heavy, principal tonnage from defense program activity. Both private industry and government projects are now coming up for bidding. Prices are firm, both in mill and warehouse markets. Probably the strongest situation in this product in many years, the outlook is extremely optimistic both from price and tonnage standpoint.

Boston — Except for close to 3000 tons of concrete bars and piling, placed for a Connecticut river span, bridge and highway reinforcing steel requirements are light. Mounting

Concrete Bars Compared

	Tons
Week ended Sept. 28	18,674
Week ended Sept. 21	9,897
Week ended Sept. 14	9,963
This week, 1939	12,133
Weekly average, year, 1940	9,383
Weekly average, 1939	9,197
Weekly average, August	14,186
Total to date, 1939	378,401
Total to date, 1940	365,942

Includes awards of 100 tons or more.

—The Market Week—

housing needs are supplemented by a defense workers project at Kittery, Me., bids in, and four active similar jobs will take close to 2000 tons of concrete bars. Most current buying is for small lots on which prices are stronger. While scattered shading continues on larger tonnages, concessions are smaller.

New York—Reinforcing steel inquiry is better than current buying, which is temporarily slower than in recent weeks. Highway projects being figured for New York and New Jersey approximate 1400 tons, bids closing early in October. While concrete bar deliveries out of warehouse are prompt, mill deliveries are extended up to 60 days by some rollers. Prices are firming steadily on most tonnage.

Philadelphia — Considerable reinforcing bar business is in prospect with several large tonnages actively pending. Orders at the moment are light.

Reinforcing Steel Awards

- 7000 tons, units 7 to 10, inclusive, Bonneville power house foundations, to Bethlehem Steel Co., Seattle.
- 6200 tons, navy yard drydocks, 4000 tons at Philadelphia, 2200 tons at Norfolk, Va., to Jones & Laughlin Steel Corp., Pittsburgh, through Drydock Associates Inc., New York.
- 800 tons, purchasing agent, Los Angeles county, California, to Ceco Steel Products Corp., Los Angeles.
- 600 tons, United States army buildings, Lowery field, Ohio, to Colorado Fuel & Iron Corp.; F. J. Kirekhol, contractor.
- 500 tons, additional work, pier extensions, navy yard, Portsmouth, N. H., to Bancroft & Martin Rolling Mills Co., Portland, Me.; Aberthaw Co., Boston, contractor.
- 465 tons, U. S. ordnance department, typical melt loading line, Savannah, Ill., to Bethlehem Steel Co., Bethlehem, Pa.
- 350 tons, subway, route 110, section 10, Brooklyn, to Bethlehem Steel Co., through George H. Flinn Corp., New York.
- 300 tons, Cedarhurst Co. apartments, Cleveland, to Truscon Steel Co., Youngstown, O.; George R. Gall, contractor.
- 300 tons, hangar and repair shop, Mobile, Ala., to Truscon Steel Co., Youngstown, O., through A. J. Rife Construction Co., Dallas, Tex.
- 255 tons, Commonwealth Edison Co., Flsk street station, Chicago, George A. Fuller, contractor, to Jos. T. Ryerson & Son Inc., Chicago.
- 243 tons, filtration plant, Gadsden, Ala., to Truscon Steel Co., Youngstown, O., through V. B. Higgins & Co., Greensboro, N. C.
- 235 tons, mesh, highway project RC-40-62 & 63, Jefferson county, New York, to American Steel & Wire Co., New York; Belmar Co., Troy, N. Y., contractor, \$220,801.83, bids Sept. 4, Albany.
- 200 tons, Albertus Brown Homes housing, Toledo, O., to Pollak Steel Co., Cincinnati; Weinstein Construction Co., contractor.
- 175 tons, paving, Ida county, Iowa, to Sheffield Steel Corp., Kansas City, Mo.
- 160 tons, Mesta Machine Co., forge plant

- foundations, Pittsburgh, to Bethlehem Steel Co., Bethlehem, Pa.; Booth & Flinn, contractors.
- 138 tons, state of Indiana, bridge No. 2015, to Missouri Rolling Mill Corp., St. Louis.
- 129 tons, city of Harrisburg, Pa., invitation 505-24-31, to Bethlehem Steel Co., Bethlehem, Pa.; through Service Supply Co.
- 124 tons, Employes Mutual Life Insurance building, Wausau, Wis., to Bethlehem Steel Co., Bethlehem, Pa.
- 100 tons, Wabash railroad, St. Louis county, Missouri, to Laclede Steel Co., St. Louis.
- 100 tons, new plant building, General Chemical Co., near Detroit, to Concrete Steel Fireproofing Co., Detroit; W. E.

- Wood Co., Detroit, contractor.
- 100 tons, student union, state college, Fresno, Calif., to Kyle & Co., Fresno, Calif.
- 100 tons, Cessna Aircraft Co., Wichita, Kans., to Sheffield Steel Corp., Kansas City, Mo.
- 100 tons, state highway project RC-40-73, Westfield Village, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; John B. Schultz Contracting Co. Inc., Buffalo, contractor.

Reinforcing Steel Pending

- 1850 tons, including 150 tons mesh, grade crossing elimination, contract 5, Long Island railroad, Rockaway Beach, N. Y.; Charles A. Vachris Co., New



A modern residence containing many applications of lead. Right—a lead service pipe laid in Rome more than 1,800 years ago, and still in perfect condition.

For Economy in Maintenance... USE LEAD

This modern Connecticut residence contains lead plumbing, lead flashing, lead gutters, spouts and drains, a lead chimney cap, lead service pipe underground and ornamental lead lighting fixtures. Finally, the entire house, inside and out, is painted with pure white lead paint. These applications of lead are typical in building. Back of them is, first of all, the remarkably high durability of lead, which is greater than that of any other common metal. This is exemplified by the remarkable preservation of the 1,800-year-old lead service pipe shown above. Other desirable characteristics are its malleability, comparatively low melting point and excellent corrosion resistance.

In the use of lead for building purposes, the brands sold by the St. Joseph Lead Company, all virgin metal, have established a standard for unvarying quality. For the production of white lead paint, DOE RUN and BUNKER HILL corroding lead are extensively used. In the manufacture of solder or caulking of pipe joints, where a soft desilvered lead is required, HERCULANEUM is specified. The copper content (.06 to .07) of ST. JOE CHEMICAL LEAD makes it the ideal lead for use in plumbing by decreasing corrosion attack and imparting to pipe greater tensile strength and resistance to deformation.

ST. JOSEPH LEAD COMPANY

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Pig Iron

Pig Iron Prices, Page 72

Pittsburgh — Pittsburgh Crucible Steel Co. has blown in an additional furnace at its Midland, Pa., works, making 41 stacks active of the 50 in the district. At other points production is being maintained at a high level and September tonnage is expected to be on the same level as August, in spite of the fewer number of working days. Outlook for October indicates it will probably be the best month of the year. Inquiry is fairly good from the smaller markets and nonintegrated steel companies are buying up all available supplies.

Cleveland—September pig iron shipments will show a fairly large increase over August, the movement being at the best rate so far this year. Foundry operations are expanding, with further gains indicated through fourth quarter. Some jobbing shops still have additional capacity, operations ranging from three to five days a week. Consumers have placed heavy orders for fourth quarter delivery, but in contrast to the situation a year ago, buying is predicated on known requirements rather than being of a speculative nature.

Boston — Pig iron buying for fourth quarter is general on the part of most New England consumers, except a few of the larger melters who continue to draw on inventories without providing for replacement in volume. Shipments are steady and deliveries of foundry coke have gained.

Cincinnati — Pig iron shipments are heavier, former peaks of the year being challenged, due to a heavier melt and general policy of larger inventories. The melt is near 75 per cent. Current buying is in carload lots, as quarter needs were adequately covered last summer.

St. Louis—Shipments of pig iron have increased sharply and indicate that the September total will exceed that of August by fully 40 per cent, besides being the largest September tonnage since 1937.

Philadelphia — Some substantial pig iron buying, foundry and basic, is noted here. Requirements are exceeding earlier estimates and there is concern as to deliveries later in the year.

Warehouse

Warehouse Prices, Page 73

Pittsburgh—Local warehouse sellers report activity high, with construction items leading. Structural, plates, nails and other wire products are particularly active.

York, low, bids Sept. 26.

1200 tons, post office garage, Boston; Grande & Volpe, Malden, Mass., low, bids Sept. 24, Washington.

1000 tons, tank assembly plant, Chrysler Corp., Macomb county, Michigan; bids Sept. 26.

790 tons, including 240 tons wire mesh, additions, naval ammunition depot, Hawthorne, Nev.; bids opened.

750 tons, bars and rods, materiel division, air corps, Wright Field, Dayton, O.; bids Oct. 2, sch. 616.

500 tons or more, naval reserve armory, Seattle; funds allocated; bids soon.

450 tons, highway project, route 6, sections 8A and 8B, Clifton, Passaic county, New Jersey; bids Oct. 11, E. Donald Sterner, state highway commissioner, Trenton.

350 tons, housing project, Pawtucket, R. I.; taking bids.

350 tons, for bridge over Mississippi river at Chester, Ill.; Massman Construction Co., Kansas City, Mo., general contractor.

260 tons, highway project, route 39, sections 1B and 10A, Burlington-Mercer counties, New Jersey; bids Oct. 11, E. Donald Sterner, state highway commissioner, Trenton.

225 tons, highway, route 29, section 2D, Union county, New Jersey.

200 tons, Sherwin-Williams Co. paint factory, Chicago.

200 tons, housing project, Newark, N. J.; Fatzler Construction Co., Newark, N. J., low.

165 tons, Cook county, Illinois, highway letting; bids Sept. 30.

160 tons, housing, Rock Island, Ill.

162 tons, bridge, FAP-486-C-1, Fairland, Okla.

135 tons, shop building, Consolidated Machine Tool Co., Rochester, N. Y.

120 tons, Morrell Packing Co. plant, Sioux Falls, S. Dak.

115 tons, Fairbanks, Morse & Co. plant, Beloit, Wis.

105 tons, bridge, FBI of 79-13-5-C1, Caro, Mich.

100 tons, plant addition, Owens-Illinois Glass Co., Bridgeton, N. J.; bids Oct. 1.

100 tons or more, Bellingham, Wash., normal school addition; Hoard Engineering Co., Seattle, general contractor.

100 tons or more, addition to Pierce county hospital, Tacoma, Wash.; C. F. Davidson, Tacoma, general contractor.

100 tons or more, addition to Swedish hospital, Seattle; Teufel & Carlson, Seattle, general contractors.

100 tons or more, city hall, Longview, Wash.; K. T. Henderson, Longview, low.

100 tons, Greenup county, Kentucky, highway project FAS 292-D(1); bids Oct. 4.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh — Situation is unchanged, with buying off. Shipments are being made as much from stock as from current production, which is estimated at 40 per cent, unchanged from last week. Fair general line business continues. Export inquiries are numerous, but packers' can business has about finished up for the year.

Specials

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MANUFACTURED
TO MEET
YOUR NEEDS
by
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Our Engineers are ready to give you full cooperation in the development of special products. Write today.

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3517 SHIELDS AVE. • CHICAGO

Prices are firm. Total tonnage during September is slightly better than in August.

Chicago—Warehouse demand is heavier, with quick delivery sought. Increase now is about 5 to 10 per cent over last month. Bars and sheets continue in demand and plates and shapes are more active.

Boston—Sharp upturn in volume has been felt by most jobbers since the second week in September. Prices are unchanged and firm with the exception of some transactions in hot-rolled and galvanized sheets.

New York—Volume booked by steel warehouses is heavy, September sales topping the previous month by a good margin, most jobbers report. Buying is well diversified with more orders indirectly connected with defense contracts. Despite active demand and firm mill quotations, resale prices on some products are weak, including nails, pipe and sheets, hot-rolled and galvanized.

Buffalo—Distributors' stocks are being reduced as mills are extending shipments on most items. Meanwhile, demand from practically every consuming source continues brisk. With national defense needs behind the buying movement, an increase is noted in the movement of heavy lines.

Scrap

Scrap Prices, Page 74

Pittsburgh—Prices remain firm on all grades. Mills are offering to buy almost all classifications, but thus far brokers have refused to sell at offered levels. Heavy tonnage now pending on the current Pennsylvania railroad list, which closes Oct. 2, will probably act as

Details of the embargo on shipments of scrap from the United States, promulgated last week at Washington, will be found on page 13 of this issue.

a spur to the market and may give some indication of the true price level.

Cleveland—Prices continue strong, with blast furnace grades higher. Steelmaking scrap generally is unchanged, although supplies are tight and it is difficult for sellers to pick up No. 1 steel for less than \$20. Railroad lists will be bid this week and are expected to provide a clue to the subsequent price trend.

Chicago—Buying of tonnages by two mills has caused prices to rise and recent railroad list sales have

been at higher figures. Dealers are seeking to cover at 25 cents per ton above the level at which they took previous orders. Grades not yet advanced show strength and indications of higher levels.

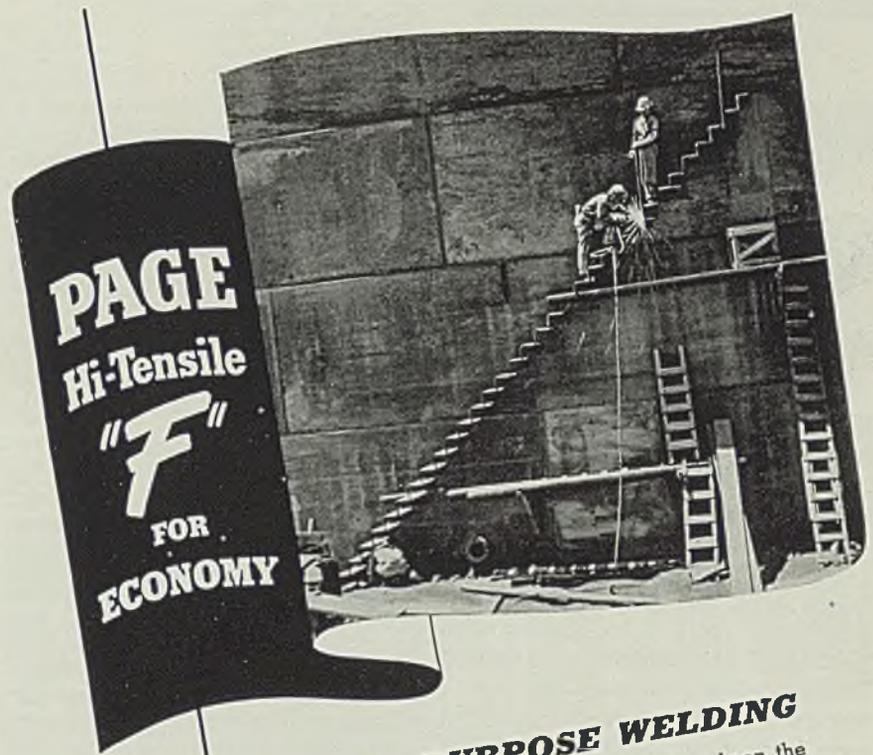
Boston—In view of the high melt by foundries and other consumers new buying is light, indicating coverage during the flurry several weeks ago was heavier than generally supposed. However, scrap has been worked off at a higher rate than was estimated, and inventories in some instances have reached a point where resumption of buying appears imminent.

Buffalo—Prices on steelmaking grades advanced 50 cents a ton on a sale of approximately 10,000 tons of No. 2 heavy melting steel to a district consumer at \$18 to \$18.50 a ton. Small sales also justified a

similar rise on No. 1 steel, which reached \$20 to \$20.50 a ton. Sales were also reported on other items at higher levels.

Detroit—No signs of easing up are appearing in the scrap market and prices are higher generally by 50 cents a ton. Specialties are in particular demand, such as low-phosphorus plate and punchings. Steel rails are quoted \$1.50 a ton higher at \$23.00 to \$23.50 in the face of good demand from foundries.

St. Louis—Under scant supplies and brisk demand the scrap market continues active, new highs on the present movement being recorded on all grades. Large tonnages were purchased by two east side mills on a basis of \$16 for No. 2 heavy melting, which represents an advance of 50 cents per ton over a week



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ago. Delivery in 60 days is specified, and the business was split between several local dealers.

Cincinnati—Dealer bids on most grades of iron and steel scrap have been advanced 50 cents. Activity of dealers is pronounced, but not matched by mill buying, although it is in greater volume than in recent months. Foundries are also expanding demands. Higher prices fail to bring out tonnage expected.

Birmingham, Ala. — Scrap is strong, as indicated by an advance of \$1.50 on heavy melting and com-

parable increases in other items. Foundries are taking considerable scrap.

Steel in Europe

Foreign Steel Prices, Page 73

London—(By Cable)—Heavy imports of semifinished and finished steel continue to supplement intensive domestic production in Great Britain. Iron ore supplies now are sufficient to permit some stock accumulation. The light castings industry is more active. Trade in tin plate is dull, with some demand coming from South Africa and Australia. Export of sheets and galvanized sheets is extremely reduced, owing to heavy domestic demand.

Iron Ore

Iron Ore Prices, Page 74

New York—One of the largest, if not the largest, shipments of tungsten ore ever received in this country arrived here Thursday, approximately 3500 tons, for account of Metals Reserve Corp., Washington. This was Chinese ore shipped through a French Indo-China port. Close to 5000 additional tons is understood to be in transit for the same buyer.

Ryerson Adds Manganal, Manganese-Nickel Steel

■ Joseph T. Ryerson & Son Inc., Chicago, has added manganal, an austenitic, tough, non-magnetic steel containing 11 to 13½ per cent of manganese and 3½ per cent of nickel, to its warehouse stocks for immediate shipment. This makes available a non-magnetic, abrasion resisting steel which can be welded. Weight can be saved in composite structures by welding castings and manganal plates, the latter only to give wear resistance.

The nickel content allows welding without quenching when cooled, welding rod of 18-8 stainless composition giving satisfactory results. Manganal has the advantages of 11-14 per cent manganese steel in wear resistance and surface work hardening. It can be sheared up to ½-inch thick. It can be flame cut and requires no subsequent heat treatment when formed or punched hot.

Chemical composition is: Carbon, 0.60 to 0.90; manganese 11 to 13½ per cent; silicon, 0.60 to 0.95; nickel, 2.50 to 3.50. Tensile strength is 140,000 to 150,000 pounds per square inch; elastic limit, 55,000 to 60,000

pounds per square inch; elongation in two inches, 72½ per cent; reduction of area, 54 per cent.

Hot-rolled manganal plates are being used for electrical applications where non-magnetic characteristics rather than abrasion resistance are required. Typical applications include journal boxes, pedestal liners, wear plates, mill liners, shovel buckets, conveyors, crusher hammers and others.

Hot-rolled manganal is carried in the Ryerson warehouses in 48 x 120-inch plates in thicknesses of 3/16, ¼, ⅜, ½, ⅝, ¾ and 1 inch.

Tungsten Ore Higher On Indo-China Crisis

New York—The Indo-China crisis has imparted added strength to the tungsten ore market, although the price range on Chinese wolframite continues much the same. A recent offering was slightly in excess of \$24, duty paid, per short ton unit, but actual trading, it is believed, can still be done at \$23.50 to \$24.

Buyers admit, however, that a definite test, which has not as yet developed, may result in a generally higher spread, and that in view of the stronger trend, this test may come soon.

With the Burma road already closed and these more recent complications, shipments out of China are expected to be increasingly difficult. On the other hand, no one in the trade expects now an entire suspension of Chinese shipments. A possible open break between Great Britain and Japan would probably seal up Hong Kong and other large ports, but it is believed it would be a long time before the closing of all the minor outlets, which would provide for the movement of at least small quantities, so long as there are boats available to receive them.

Importations of South American ores from Bolivia and Argentina, in particular, are said to be gaining somewhat. However, most of these ores, which have been going principally to Europe until recent months, do not readily meet the requirements of this country and buying is still limited.

From the standpoint of most elements, the ores meet specifications here very well, but, it is explained, there are usually one or two elements which are out of line. Consequently, only larger buyers, who are in position to buy ore in sufficient quantities to provide a proper mixture, show much interest in South American and Mexican ores, and even then, it appears, some show none too much. These ores

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sell generally at concessions under Chinese wolframite.

Domestic scheelite is moving in steadily increasing volume at around \$22.50 to \$23.00, duty paid equivalent. No offers of Malayan scheelite have been noted in some time; hence the market, which was last quoted at around \$25, duty paid, is purely nominal.

Nonferrous Metals

New York—All metal sales and prices, with the exception of tin, advanced sharply last week due to the heavy influx of product orders from our government, domestic consumers, and England. Armament and defense programs, as well as an increase in "peace-time" industrial activity, have boosted needs for all major nonferrous metals.

Copper—Producers were unable to satisfy demand at the previous price level and advanced electrolytic copper to 12.00c, delivered Connecticut valley. All rolled and drawn allied product, brass and bronze ingot, and scrap prices rose in line with the higher virgin metal market. Sales for September will total about 250,000 tons, 36 per cent above the previous record. Fabricators now have on order with refiners 325,000 tons of copper, possibly an all-time record.

Lead—A 10-point advance in prices to the basis of 5.00c, New York, on Monday will permit an increased amount of foreign lead to enter domestic consumption. Large stocks of Mexican lead in this country guarantee an adequate supply and a check to further price rises.

Zinc—Prices jumped 40 points on Monday to 7.25c, East St. Louis, a new high since 1937, reflecting tightness of nearby supplies. Buying at the new level was less insistent, due in part to the fact that consumers have on order with smelters a near-record of 91,000 tons. Galvanizing sheet output is holding at the year's peak rate of 76 per cent of capacity.

Tin—Growing tension in the Far East, threatening control of important tin producing areas, tended to stimulate demand and lift prices. Straits spot rose from 50.05c at the beginning of the week to the high and close of 51.25c. Arrivals so far this month have been at a rate twice that of consumption while nearly 90 per cent of tin now afloat is destined for the United States.

■ Men of military age may continue to buy, build or modernize homes of their own under the federal housing administration's program, and lending institutions may continue to advance money for this purpose, just as they did before passage of the selective draft act, Administrator Stewart McDonald announced last week.

Nonferrous Metal Prices

Sept.	Copper			Straits Tin, New York		Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99% Spot, N.Y.	Anti-mony Amer. Spot, N.Y.	Nickel Cathodes
	Electro. del. Conn.	Lake, del. Midwest	Castling, refinery	Spot	Futures						
21	11.50	11.50	11.25	50.05	50.05	4.90	4.75	6.85	18.00	14.00	35.00
23	11.50	11.50	11.37 1/2	50.05	50.05	5.00	4.85	7.25	18.00	14.00	35.00
24	12.00	12.00	11.62 1/2	50.10	50.05	5.00	4.85	7.25	18.00	14.00	35.00
25	12.00	12.00	11.62 1/2	50.25	50.15	5.00	4.85	7.25	18.00	14.00	35.00
26	12.00	12.00	11.62 1/2	50.50	50.35	5.00	4.85	7.25	18.00	14.00	35.00
27	12.00	12.00	11.62 1/2	51.25	51.12 1/2	5.00	4.85	7.25	18.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets	
Yellow brass (high)	19.23
Copper, hot rolled	20.62
Lead, cut to jobbers	7.25
Zinc, 100 lb. base	12.50
Tubes	
High yellow brass	21.98
Seamless copper	21.12
Rods	
High yellow brass	14.76
Copper, hot rolled	17.12
Anodes	
Copper, untrimmed	17.87
Wire	
Yellow brass (high)	19.48

OLD METALS

Nom. Dealers' Buying Prices	
No. 1 Composition Red Brass	
New York	7.87 1/2 - 8.12 1/2
Cleveland	8.62 1/2 - 9.12 1/2
Chicago	7.75 - 8.25
St. Louis	8.37 1/2

Heavy Copper and Wire	
New York, No. 1	9.50-9.75
Cleveland, No. 1	9.37 1/2 - 9.87 1/2
Chicago, No. 1	9.00-9.37 1/2
St. Louis	9.37 1/2

Composition Brass Turnings	
New York	7.50-7.75

Light Copper	
New York	7.50-7.75
Cleveland	7.37 1/2 - 7.87 1/2
Chicago	7.00-7.37 1/2
St. Louis	7.37 1/2

Light Brass	
Cleveland	4.12 1/2 - 4.37 1/2
Chicago	5.00-5.25
St. Louis	4.87 1/2

Lead	
New York	4.25-4.35
Cleveland	3.75-4.00
Chicago	3.85-4.10
St. Louis	3.60-3.85

Zinc	
New York	3.87 1/2 - 4.12 1/2
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum	
Mis., 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	12.25
Standard No. 12 aluminum	14.00-14.50

Construction and Enterprise

Ohio

ALLIANCE, O.—Babcock & Wilcox Co., 85 East Liberty street, New York, has bought former A. G. Reeves Co. plant and will recondition before starting production. Company manufactures power plant equipment, including boilers,

superheaters and coal pulverizing equipment.

CANTON, O.—Canton Development Corp. is raising funds to finance removal of Peerless Pump Co. from Massillon, O., to former Kittoe Boiler & Tank Co. plant at Camden avenue and Bank place. Removal is forced by flood control project

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—Construction and Enterprise—

at Massillon. Company manufactures pumps for ships, flood control and water supply and has contract for fuel pumps for aircraft carriers.

CLEVELAND—Fulton Foundry Co., 7350 Morgan avenue, is having plans drawn by Walther J. Wefel, engineer, 3327 Yorkshire road, for one and two-story addition 30 x 200 feet for enlarged foundry and pattern storage space.

CLEVELAND—Cuyahoga Foundry Co., 4530 East Seventy-first street, has plans by Theodore A. Badowski, 7100 Broadway avenue, for a foundry addition 80 x 116 feet. James V. Proshok is president.

CLEVELAND—Wellman Engineering Co., 7000 Central avenue, A. E. Gibson, president, manufacturer of industrial machinery and equipment, will add 12,000 square feet of floor space to its structural shop. General contract has been given Albert M. Higley Co., 2036 East Twenty-second street.

CLEVELAND—Iron Fireman Mfg. Co., 3170 West 106th street, manufacturer of stokers, will transfer all stoker manufacturing operations from Portland, Oreg. to Cleveland. Portland plant will be devoted to production of airplane parts contract having been taken for parts for army flying fortresses.

CLEVELAND—Multi-Alloy Die Casting Machines Inc. is being formed to manufacture die casting equipment, James L. Love, president, George S. Davis, secretary-treasurer, both officers of Cuyahoga Tool & Mold Co., 16131 Holmes avenue. Latter company's facilities will be used at present, with separate plant planned for early occupancy.

CLEVELAND—Artistic Iron Products Co., 7310 Bessemer avenue, is being incorporated, to provide funds for expansion to handle increased volume of production. A two-story addition with about 10,000 square feet floor space will be built.

CLEVELAND—Park Iron Works, Inc., 6390 Park avenue, industrial building and bridge construction steel, is increasing capital and adding principals. Griffith H. Powell and Edward Gallagher will be officers in the new organization.

CLEVELAND—Dempsey Plastic Parts Inc., M. E. Dempsey and Lewis Hanford, 1502 Castle avenue, principals, is negotiating for two-story building in Lorain avenue-West Twenty-fifth street district and has ordered special presses and other equipment. Alterations and remodeling will be done.

CLEVELAND—Ohio Forge & Machine Co., 3010 Woodhill avenue, is enlarging its tool-hardening plant at cost of \$18,000. Plant is located at 2951 East Ninety-third street. H. L. Vokes, 5300 Chester avenue, is general contractor.

CINCINNATI, O.—Cincinnati Bleckford Tool Co., 3220 South street, Oakley, O., a suburb, will build an addition to its plant, 134 x 253 feet, to cost about \$140,000.

CINCINNATI—Cincinnati Gear Co., Frank Sorenson, secretary-treasurer, will build addition adjoining present plant, 3400 square feet floor space, for storage of raw materials.

ELYRIA, O.—Westinghouse Automotive Air Brake Co., now located at Pittsburgh, will move general office and factory to Elyria as soon as office and factory building containing 150,000 square feet floor space can be built. Site of 35 acres on Cleveland road and New York Central tracks has been bought.

MANSFIELD, O.—Tappan Stove Co., 150 Wayne street, is building enameling department, one story, 60 x 178 feet. Charles Conklin, architect, 28 Park

avenue, is letting separate contracts for various trades.

NEWTON FALLS, O.—Lightner-Ritzle Steel Corp., formerly of Cleveland, has been moved here and established with Cleveland Machine & Fabricating Co., a new enterprise. L. F. Lightner, president of both companies, has leased building at foot of Jay street, with 4000 square feet of floor space. Lightner-Ritzle Co. conducts general steel warehouse and

■ **Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 81 and Reinforcing Bars Pending on page 83 of this issue.**

steel shearing business. Cleveland Machine & Fabricating Corp. stamps, blanks and fabricates metal products and conducts machine shop.

Connecticut

BRIDGEPORT, CONN.—Bridgeport Brass Co., 774 East Main street, will build a one-story steel plant addition 120 x 130 feet at Walter and Pembroke streets, costing about \$55,000. Fletcher-Thompson Co. Inc., 1336 Fairfield avenue, is engineer. (Noted Sept. 9).

HARTFORD, CONN.—Pratt & Whitney division, United Aircraft Corp., 400 Main street, will let contract soon for brick and steel test plants to cost over \$40,000. Albert Kahn Inc., New Center building, Detroit, is engineer.

SPRINGDALE, CONN.—Stamford Rolling Mills Co., Rolling place, will build one-story rolling mill additions 240 x 280, 70 x 270, 50 x 140 and 20 x 14 feet, to cost about \$400,000. General contract has been given to F. D. Rich Co., 270 Atlantic street, Stamford, Conn.

Massachusetts

FALL RIVER, MASS.—D. J. Richardson, chairman, airport commission, city hall, will build an airport, including runways, hangars, shops and administration building, to cost about \$650,000. E. M. Corbett, 49 Purchase street, is architect.

WORCESTER, MASS.—Johnson Steel & Wire Co. Inc., George W. Forsberg, superintendent, is seeking to buy from the village of Quinsigamond, Mass., land and buildings adjoining its plant, now owned by the city. Expansion of the company's operations would follow purchase.

WORCESTER, MASS.—St. Pierre Chain Co., Thomas St. Pierre, vice president, suffered loss by fire in its warehouse and metal-treating department.

WORCESTER, MASS.—W. A. Bennett, mayor, city hall, will ask bids soon for construction of airport, including hangars, shop facilities, administration building and other accessories.

New York

HUDSON, N. Y.—Universal Atlas Cement Co., 135 East Forty-second street, New York, will build a cement plant addition to cost about \$120,000. General contract has been given Rust Engineering Co., Clark building, Pittsburgh. S. J. Robinson, care owner, is engineer.

JAMESTOWN, N. Y.—Marlin-Rockwell Corp., 402 Chandler street, manufacturer of ball bearings, has plans by Beck & Tinkham, Bailey building, for a brick and steel plant addition to cost more than \$750,000.

NIAGARA FALLS, N. Y.—Carborun-

dum Co., Buffalo avenue, abrasives manufacturer, will build a one-story plant addition 78 x 211 feet, costing about \$50,000. General contract has been given to Wright & Kremers Inc., Main and Pine streets.

Pennsylvania

BRADFORD, PA.—J. W. Becker, Main street, and associates, are undertaking natural gas and petroleum development ten miles south of Bradford, including wells, pipe lines, steel storage tanks, booster stations and pressure plants.

DU BOIS, PA.—Vulcan Soot Blower Corp., W. N. McCrelght in charge, 316 West Long avenue, has plans by R. G. Howard, 340 Deposit National Bank building, for a one-story steel and concrete plant, 100 x 125 feet, to cost over \$40,000.

EHRENFELD, PA.—Pennsylvania Coal & Coke Co., Cresson, Pa., will build a steel coal cleaning plant at No. 8 colliery, for wet washing. General contract has been given to Fairmont Machinery Co., Fairmont, W. Va. Cost estimated at \$120,000.

ERIE, PA.—Allied Oil Co. Inc., Standard building, Cleveland, plans construction of a bulk fuel oil plant, including 3,360,000 gallons of steel storage tanks, pipe line facilities, docks and other structures.

LEWIS RUN, PA.—Williams Oil Co., box 12, Bradford, Pa., is developing Musie mountain oil field, including wells, pipe lines, steel tanks and a 40 x 50-foot office and laboratory building, at cost of about \$25,000. J. Fensel, Hooker-Fulton building, Bradford, is engineer.

READING, PA.—Allegheny Chemical Corp., near Womelsdorf, Pa., Velma Kunkel, secretary-treasurer, will rebuild burned boiler house, acid plant, paint department and other buildings.

Illinois

CHICAGO—Continental Can Co., 2633 West Grand avenue, will build a four-story plant addition 150 x 200 feet, at 3800 South Ashland avenue, costing about \$200,000. W. A. Taylor, 4622 West Grand avenue, is company architect.

CHICAGO—Commonwealth Edison Co., 72 West Adams street, will let contract soon through Holabird & Root, architects, 333 North Michigan avenue, for a two-story shop building, 75 x 203 feet at its Northwest station, Roscoe street and California avenue.

McCOOK, ILL.—Electro-Motive Corp., subsidiary of General Motors Corp., Detroit, has let general contract to Ragnar Benson, LaGrange, Ill., for a one-story manufacturing addition, 250 x 300 feet, to cost about \$300,000.

MOLINE, ILL.—Peoples Light & Power Co., 1400 Fifth avenue, Moline, subsidiary of United Light & Power Co., R. B. McDonald, president, 10 Light street, Baltimore, will spend about \$1,500,000 on expansion and improvements.

ROCKFORD, ILL.—George H. Spengler Co., manufacturer of screw machine products, has awarded general contract to Linden & Sons Inc. for a two-story plant addition 34 x 48 feet.

ROCK ISLAND, ILL.—Bettendorf Co., W. E. Bettendorf, vice president and general manager, will expand its foundry department and rearrange for greatly enlarged mass production.

West Virginia

CHARLESTON, W. VA.—Appalachian Electric Power Co., 1003 Electric building, Richmond, Va., N. M. Argabrite,

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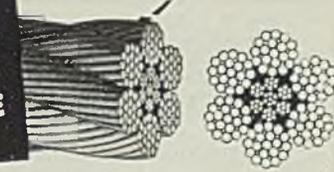
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vice president and general manager, 30 Church street, New York, will build an addition to double capacity of Cabin Creek power plant, at cost of about \$3,000,000.

NITRO, VA.—American Viscose Co., 105 South Twelfth street, Philadelphia, will let contract soon for a three-story plant addition 29 x 75 feet to cost over \$40,000. Ballinger Co., 105 South Twelfth street, Philadelphia, is engineer.

Virginia

CULPEPER, VA.—Culpeper Foundry & Machine Co. Inc., has been incorporated to deal in crucible furnaces to melt metals, with \$25,000 capital. Louis W. Schmidt, Culpeper, is president.

Missouri

CHILLICOTHE, MO.—Richards & Mullinix Co., Oklahoma City, Okla., is low at \$135,628 for construction of 202 miles of rural electric lines to serve 453 customers, for Farmers' electric co-operative, Ernest Wood, superintendent. Frank Horton, Lamar, Mo., is engineer.

HIGGINSVILLE, MO.—Federal Engineering & Construction Co., Kansas City, Mo., is low at \$186,419 for 310 miles rural electric lines to serve 734 customers, for West Central Electric Co., Morris Evans, secretary.

KANSAS CITY, MO.—Security Stove & Mfg. Co., 1630 Oakland avenue, will build two additional units, including a foundry and assembly plant for manufacture of gas-fired furnaces.

Oklahoma

ADA, OKLA.—Peoples electric co-operative, Robert J. Croy, superintendent, has given contract to Cater Construction Co., Blue Springs, Mo., at \$117,236 for 204 miles rural electric lines to serve 530 customers. E. T. Archer & Co., 609 New England building, Kansas City, Mo., are engineers.

Wisconsin

ALGOMA, WIS.—Algoma Plywood & Veneer division, U. S. Plywood Corp., manufacturer of lumber panels, etc., is having plans drawn for a plant addition.

MANITOWOC, WIS.—Wisconsin Malt-ing Co., has given general contract to Hamann Construction Co., for a malt-ing plant addition 30 x 100 feet.

MANITOWOC, WIS.—Manitowoc Ship-building Co. will build a plate shop and office facilities at cost of about \$40,000.

OSHKOSH, WIS.—Wisconsin Axle division, Timken-Detroit Axle Co., manufacturer of truck axles, has given general contract to Ben E. Ganther Co. for a plant addition.

Minnesota

BRAINERD, MINN.—Movement is on foot, sponsored by Harold Knutson, congressman, to establish a manganese ore washing plant in Crow county, at Crosby or Ironton, Minn. to beneficiate manganese ores which can be produced in quantities from the Cuyuna range.

BRAINERD, MINN.—REA has allotted \$155,000 to Crow Wing power and light co-operative, G. R. McClintock, superintendent, for 164 miles rural electric lines to serve 432 customers.

CLEMENTS, MINN.—REA has allotted 155,000 to Central Minnesota power co-operative, Edward Turner, manager, to finance 214 miles rural transmission lines to serve 430 customers.

FOSSTON, MINN.—W. B. Rund, city

clerk, is having plans prepared for a sewage disposal plant. Ray R. Gauger & Co., 2635 University avenue, St. Paul, are consulting engineers.

MELROSE, MINN.—Stearns electric co-operative, George Halonen Jr., superintendent, will ask bids soon on 222 miles rural electric lines. Ellerbe & Co., E. 1021 First National Bank building, St. Paul, are engineers.

MINNEAPOLIS—Northern Pump Co., 920 Eighteenth avenue N. E., is building a new \$1,000,000 plant, 150 x 1200 feet, 60 feet high, near Fridley, a suburb, for production of gun mounts for the navy, contract for about \$20,000,000 worth having been taken. Machinery and equipment will cost about \$2,000,000. Pesek & Shifflet, 914 Marquette avenue, are architects. Company recently also started construction of addition to plant in Minneapolis.

MINNEAPOLIS — Minneapolis-Honeywell Regulator Co., Fourth avenue and Twenty-seventh street, will build a \$250,000 addition to its plant. C. F. Haglin & Sons Inc. has the general contract.

ST. PAUL—American Hoist & Derrick Co., manufacturer of hoists, power shovels and similar equipment, will expand and improve its structural shop. G. H. Johnston, Empire Bank building, is architect.

WADENA, MINN. — Todd-Wadena Power & Light Co-operative association, Earl Schultz, president, has been allotted \$237,000 REA funds for construction of 282 miles rural electric lines in Todd and Wadena counties.

Texas

HOUSTON, TEX.—Humble Oil & Refining Co., Humble building, has submitted proposal to government to produce nitration grade toluene, Humble to erect and operate government plant, site not yet selected.

Iowa

CEDAR RAPIDS, IOWA—Bearborn Brass Co., manufacturer of plumbing supplies, has given general contract to A. J. Smith & Sons for a one-story addition 40 x 80 feet.

CLARINDA, IOWA—State board of control, D. R. McCreery, chairman, is taking bids to Oct. 1 for corliss engine, direct connected to 250-kilowatt generator at state hospital. Henry J. Liebke, Des Moines, is architect.

FORT MADISON, IOWA—State board of control, D. R. McCreery, chairman, is taking bids to Oct. 1 for a corliss engine direct connected to 600-kilowatt generator at state penitentiary.

POSTVILLE, IOWA—REA has allotted \$260,000 to Allamakee-Clayton electric co-operative, Kermit M. James, superintendent, for 300 miles of rural transmission lines.

WEBSTER CITY, IOWA—C. C. McCarthy, city manager, will open bids Oct. 7 for a steam generating unit and auxiliary equipment for the municipal light and power plant.

Idaho

BOISE, IDAHO—Public utility commission has authorized Idaho Power Co. to build 88 miles electric transmission lines, part of proposed 277-mile intercommunicating system, a \$500,000 project, in which Utah Power Co. and Montana Power Co. will participate.

CALDWELL, IDAHO—City will call bids soon for construction of projected sewage disposal plant for which site has been purchased.

Pacific Coast

LONG BEACH, CALIF.—Fritz Ziebarth, 110 Pine avenue, is building a machine shop and office at 810 West Esther street, 50 x 136 feet and 32 x 48 feet, costing about \$10,000.

LOS ANGELES—Aero Industries Technical Institute is building a machine shop at 5245 San Fernando road, Los Angeles, 50 x 160 feet, costing \$10,000.

LOS ANGELES—C. N. Clark Iron Works Inc. has been incorporated with \$500,000 capital by C. N. and B. F. Clark and Richard Garvey. Leonard Comegys, 811 West Seventh street, Los Angeles, is representative.

PORTLAND, OREG.—Columbia Aircraft Industries has been incorporated with \$100,000 capital by Harry R. Coffey and associates and plans plant for manufacture of special aircraft parts, testing laboratory and assembly department, with special processing equipment.

BELLINGHAM, WASH.—Puget Sound Pulp & Timber Co. stockholders have approved construction of third plant at cost of \$1,500,000 to increase capacity to 150,000 tons annually.

LONGVIEW, WASH.—City will call bids soon for proposed water filtration plant. Plans have been prepared by O. C. Schoenwerk, Chicago.

SEATTLE — Shipbuilding plant for Seattle-Tacoma Shipbuilding Co. on Harbor Island, Seattle, being built by General Construction Co., includes mold loft, boiler building, shops with 80,000 square feet floor space, supply warehouse and five shipways, each for two ships. Company has contract for 20 destroyers for the navy.

SPOKANE, WASH.—Universal Aircraft Co., P. D. Miller, president, will build an airplane plant at Deer Park to fabricate allmetal airplanes, with capacity for 20 ships per month. Plant will cost about \$85,000, including equipment. Company announces purchase of patents and rights from Stearman-Hammond Co., San Francisco.

TACOMA, WASH.—City is having plans prepared for a municipal water system extension to cost \$180,000 and has applied to the state for additional water rights.

Canada

HAMILTON, ONT.—Otis Fensom Elevator Co. Ltd., Victoria avenue North, is having plans prepared by Hutton & Souter, 36 James street North, for an addition costing about \$75,000.

KINGSTON, ONT.—Canadian Locomotive Works Ltd., Ontario street, has let general contract to E. G. M. Cape & Co., 620 Cathcart street, Montreal, Que., for three additional buildings at cost of about \$100,000.

PETERBOROUGH, ONT.—Canadian General Electric Co. Ltd., Park street, has let general contract to A. W. Robertson Ltd., 57 Bloor street West, Toronto, for a plant addition 160 x 800 feet. John M. Lyle, 230 Bloor street West, Toronto, is architect.

YORK TOWNSHIP, ONT.—John T. Hepburn Ltd., 18 Van Horne street, Toronto, Ont., is having plans prepared for a \$15,000 machine shop addition at 351 Weston road. C. Nicklin is engineer.

MONTREAL, QUE.—Canadian Tube & Steel Products Ltd., 5678 Hamilton street, has let general contract for a one-story addition 60 x 260 feet, costing \$50,000. J. A. Leclair & Dupuis Ltd., 620 Cathcart street, has general contract.

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Federal Works Agency, Public Buildings Administration, Washington, D. C., Sept. 16, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Standard Time, Oct. 17, 1940, for the construction of the U.S.P.O. at Ripley, W. Va. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

Federal Works Agency, Public Buildings Administration, Washington, D. C., Sept. 13, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., Standard Time, Oct. 15, 1940, for construction of the U.S.P.O. at Salem, W. Va. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

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HOW TO PUT NEW LARGE-AREA DIES TO WORK SOONER

STEP No. 1 Proceed as normally, shipping a plaster cast of the model part to Birdsboro.

STEP No. 2 From your plaster cast we will make a plaster cast pattern properly dissected to allow for normal iron shrinkage.

STEP No. 3 From that single plaster pattern we turn out the required molds. These molds are made by Birdsboro's Precision Process of Cement Molding. Even sharp corners and re-entrant angles are sharply and cleanly reproduced.

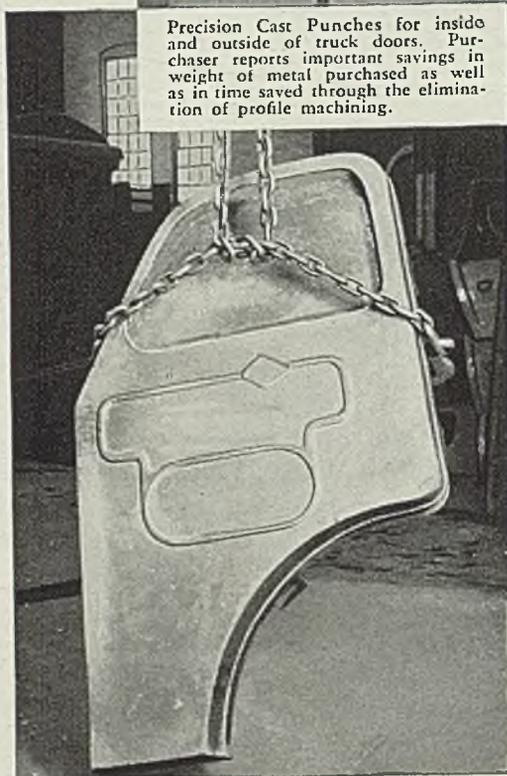
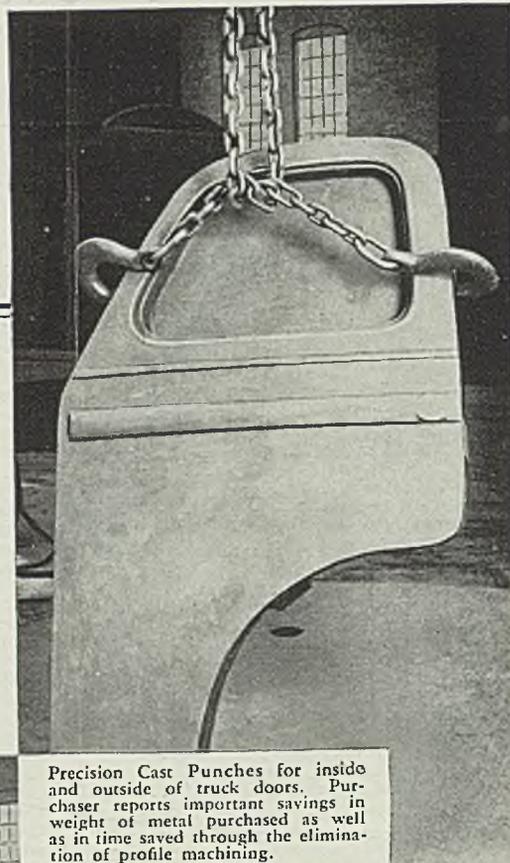
STEP No. 4 The molds are dried by the chemical reaction of "setting," not in drying ovens. In this way, warpage and dimensional changes are avoided in the mold. It remains the same completely faithful reproduction of the pattern that it was when wet.

STEP No. 5 The iron is poured. Thanks to Birdsboro's Precision Process there is practically no porosity or blow-holes on the working face of the die.

STEP No. 6 The dies are shipped to you in such condition that with little or no profiling they are ready for finishing. Tested against dimensional templates, they will be true-to-pattern. Contours will be exact and finish metal will be at a minimum.

Here is a large-area die-making method that can save weeks of time on tooling up for new models. Furthermore, you buy only the actual die metal itself, plus a small allowance for hand finishing. Everything except the original plaster cast and the final finishing is done outside your plant.

Write today for quotations and early delivery dates on this new Precision Method of Die Casting.



Precision Cast Punches for inside and outside of truck doors. Purchaser reports important savings in weight of metal purchased as well as in time saved through the elimination of profile machining.



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