Looking forward to 1990 a.d.

IN a few days our Fifteenth 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 consist-
tently 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 special-
ties 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.

FALCON
BRONZE CO.
YOUNGSTOWN
OHIO
THE purchaser of these wire machines selected EC&M Control for this recent installation, because they have had successful performance with EC&M Wire Machine Controllers for a number of years. They know, from experience, that EC&M Engineers understand the unusual control requirements of this service.

And operating departments prefer EC&M Control because it gives accurate results — perfect speeds for threading and positive stopping in case of emergency. With contactors of Line-Arc design, response is quick and up-keep costs are low. Contact life is longer and there is no destructive burning on the arc shields. Ask our nearby office for complete data on EC&M Wire Machine Controllers.
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., 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 Allyne-Ryan Foundry Co., Cleveland, Ohio. Strong, hard and wear resistant, also resistant to heat and mild shock, Nickel cast irons are readily machined.

OVER 2 TONS

in weight is this large alloy 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.

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.
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.

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 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.

Costs May Increase

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.

Edward L. Ryerson Jr. (p. 22) 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 cantonments. . .

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. 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.
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.

Night loading to "clear the decks" for tomorrow's new crop of orders is the regular course of business. Every order is RUSH at Ryerson—most are shipped the day received.

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.

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

The institute revealed that it received a letter from Dr. Guilherme Guinle, president of the Brazilian executive committee having charge of the plan, stated:

"We should also want the privilege of concuring 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 manufacturing of steel in the United States until successful operation has been assured to the mutual satisfaction of the Export-Import bank and Brazilian investors."

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 plant will be made by the Export-Import bank to the company which is to own and operate the mill and endowed 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."

"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 assign 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 indicates 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 preceding 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 of all the respondent banks, one of the nation's banks could be reached. The board of governors of the federal reserve system, working in cooperation 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 safeguard the government's interest in such facilities on termination or completion of the contract."
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 the total was 22,364 long tons, plus 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, solders, 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 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.

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 overall 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 possible 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.

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 being 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 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."

More than 64 centuries of service by 217 employees was recognized by the American Steel & Wire Co. at a luncheon at its American works, Cleveland, Saturday, Sept. 28. The employees, 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 employee 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., trucks and busses, $1,597,456.**

**American Locomotive Co., New York, tanks, $32,070,000.**


**Baldwin Locomotive Works, Philadelphia, tanks, $18,765,000.**

**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, $1,160,180.**

**Colorado Fuel & Iron Corp., Pueblo, Colo., ammunition components, $4,585,000.**

**Curtiss-Wright Corp., Gar Wood Industries Inc., Detroit, artillery material, $1,700,000.**

**Crosby Co., Buffalo, ammunition components, $2,704,026.**

**Curtiss-Wright Corp., Manhattan, N. Y., forceps, $65,550.**

**Diamond T. Motor Car Co., Chicago, trucks and busses, $1,597,456.**

**Equitable Equipment Co. Inc., New Orleans, steel cage barge, single screw diesel, steel tug, $128,533.**

**Fargo Motor Corp., Detroit, trucks, $4,780,591.**

**General Motors Corp., Detroit, trucks, $6,088,549.**

**Hall-Scott Motor Car Co., Berkeley, Calif., gasoline engine, $90,000.**

**Harley Davidson Motor Co., Milwaukee, motor-tricycles, $2,260.**

**Indian Motorcycle Co., Springfield, Mass., motor-tricycles, $719.**

**Kernell Mfg. Co., Detroit, gasoline and diesel engines, $17,659.90.**

**Lake State Products Inc., Jackson, Mich., diesel tractors, $6566.26.**

**LeTourneau Inc., Peoria, 111., construction equipment, $52,756.75.**

**American Car & Foundry Co., Berwick, Pa., tanks, $32,070,000.**

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Purchases Under Walsh-Healey Act

Iron and Steel Products

Air Conditioning & Refrigeration Supplies Inc., Charles-town, Conn.

Allegeny Ludlum Steel Corp., Watervliet, N. Y.


American Car & Foundry Co., New York

American Cast Iron Pipe Co., Kansas City, Mo.

American Locomotive Co., New York

American Steel & Wire Co., Chicago

Babcock & Wilcox Tube Co., Beaver Falls, Pa.

Bethlehem Steel, San Francisco

Cary Machinery & Supplies Co., Chicago

Carnegie-Illinois Steel Corp., Chicago

Carnegie-Illinois Steel Corp., Pittsburgh

Champion Valve Corp., Davenport, lowa

Columbus Steel Tank Co., Kansas City, Mo.

Columbus Bolt Works Co., Columbus, 0.

Crucible Steel Co. of America, New York

Eastern Steel Tank Corp., Brooklyn, N. Y.

H. Brinton Co., Philadelphia

Henry Diston & Sons Inc., Philadelphia

Inland Steel Co., Chicago

John A. Roebling’s Sons Co., Trenton, N. J.

Latlrope Electric Steel Co., New York

Marshall Stove Co., Lewlsburg, Tenn.

Midvale Co., Philadelphia

Miller Mfg. Co., Baltimore


Onslow Bolt & Screw Co., Sandusky, 0. &

P. R. Maltby & Co. Inc., Indianapolis

Pennsylvania Forge Corp., Philadelphia

Peter Rademan Inc., Philadelphia


Republic Steel Corp., Massillon, O.

Sandusky Foundry & Machine Co., Sandusky, O.

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

Struthers Wells-Titusville Corp., Titusville, Pa.

Transue & Stansell Steel Forging Corp., Alliance, O.


United States Pipe & Foundry Co., Philadelphia

Virginia Bridge Co., Rossville, Va.

W. S. Rockwell Co., New York


Youngstown Sheet & Tube Co., Youngstown, O.

Commodity

Stand assemblies

Bridge parts

Cast iron pipe

Forgings

Steel

Steel tubing

Steel

Miscellaneous tools

Galvanized iron

Steel forgings

Brake uniform

Liquid containers

Wedges

Tool steel

Gasoline tanks

Telescope mounts

Armor plate

Steel

Wire cloth

Gas tests

Heating stoves

Tube forgings

Bath tubes

Fence gates

Machinists sets

Shackle releases

Forgings

Forgings

Wood screws

Steel

Shaft sleeves

Plugs

Fittings

Connections

Hand tools

Cast iron pipe

Bridge parts

Forge furnaces

Guns

Wire nails

Nonferrous Metals and Alloys

Aluminum Co. of America, Pittsburgh

Aluminum Co. of America, Grange, III.

American Brass Co., Waterbury, Conn.

Bart Laboratories, Belleville, N. J.

General Electric Co., Schenectady, N. Y.

Graflex Camera Corp., LaSalle, 111.

Harvey Metal Corp., Chicago

Metalite Mfg. Co., Los Angeles

Revere Copper & Brass Inc., Baltimore

Scovill Mfg. Co., Waterbury, Conn.

Walter Kiddie & Co., Inc., New York

Wollem & Westinghouse Co., Philadelphia

W. P. Fuller & Co., San Francisco

Conductor, caps

Coffee boilers

Bar brass

Mirrors & molds

Stranded cable

Plugs & screw

Body forgings

Aluminum mess

Copper brass

Body forgings

Fire extinguishers

Condenser tubes
### Purchases Under Walsh-Healey Act (Cont.)

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<th>Machinery and Other Equipment</th>
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<td>A. B. Farquhar Co., Ltd., York, Pa.</td>
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<td>American Machine &amp; Foundry Co., Cambridge, Mass.</td>
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<td>H. P. Sturtevant Co., Chicago</td>
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<td>Brown &amp; Sharpe Mfg. Co., Providence, R. I.</td>
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<td>E. W. Bliss Co., Brooklyn, N. Y.</td>
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<td>Consolidated Machine Tool Corp., Elmhurst, N. Y., airspeed indicators</td>
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<td>Consolidated Steel Co., Orange, Tex., heat-treating furnaces</td>
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<tr>
<td>D. Co., Elmhurst, N. Y., airspeed indicators</td>
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<tr>
<td>E. L. Essley Machine Co., Chicago</td>
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<tr>
<td>General Electric Co., Schenectady, N. Y., blading machines</td>
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<td>Heald Machine Co., Worcester, Mass.</td>
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<td>Henry Prentiss Co., New York</td>
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<td>Ingersoll-Rand Co., New York</td>
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<td>International Harvester Co., Chicago</td>
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<td>Lapointe Machine Tool Co., Hudson, Mass.</td>
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<td>L. R. Co., Milwaukee</td>
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<td>Mall Tool Co., Chicago</td>
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<tr>
<td>National Twist Drill &amp; Tool Co., Detroit</td>
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<td>Norton Engineering Co., Chicago</td>
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<td>Osgood Co., Marion, O.</td>
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<tr>
<td>R. K. Le Blond Machine Tool Co., Cincinnati</td>
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<tr>
<td>R. L. Harris Inc., Knoxville, Tenn.</td>
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<tr>
<td>Ransome Concrete Machinery Co., Dunellen, N. J.</td>
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<td>Reed-Prentice Corp., Worcester, Mass.</td>
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<td>S. M. Co., York, Pa.</td>
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<td>S. Morgan Smith Co., York, Pa.</td>
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<td>Sager-Spuck Supply Co. Inc., Albany, N. Y.</td>
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<td>Skolnick Building Corp., New York, extensions at Washington navy yard</td>
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<td>Smith-Cortney Co., Richmond, Va.</td>
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<tr>
<td>Struthers Wells-Titusville Corp., Titusville, Pa.</td>
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<tr>
<td>Sullivan Dry Dock &amp; Repair Co., Brooklyn, N. Y.</td>
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<td>Teletype Corp., Chicago, character transmission systems</td>
<td>$19,800.00</td>
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<tr>
<td>United Aircraft Corp., Vought-Sikorsky Aircraft division, Conn. spare parts for airplanes</td>
<td>$19,800.00</td>
</tr>
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<td>United States Gauge Co., New York, airspeed indicators</td>
<td>$19,800.00</td>
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<td>Wm. Sellers &amp; Co. Inc., Philadelphia, planer, double housing</td>
<td>$19,800.00</td>
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<tr>
<td>Westinghouse Electric &amp; Manufacturing Co., Newark, N. J., indicators, switches</td>
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</tr>
<tr>
<td>Wire Rope Corp. of America, New Haven, Conn., wire target towing hawser</td>
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</tr>
<tr>
<td>Worley &amp; Co., Pico, Calif, metal lockers</td>
<td>$19,800.00</td>
</tr>
</tbody>
</table>

*Estimated

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**Grand Total:** $13,148,672.53

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- 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. The Tennessee Valley Authority, B. F. 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 $31,093,564 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 percent respectively.

August shipments of power-driven metalworking machinery increased to the record total of $21,420,050, surpassing the previous high, $21,281,322, established last April and showing a 44 per cent increase over July exports. Shipments of grinders, totaling $4,504,421 in August, compared with $2,186,361 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 milling drills increased at $917,993 showed a modest gain for the month, 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 $393,687 as against $582,087 in July.

 exports of iron and steel products, scrap excepted, reached a new low in August when trade totaled only 2080 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 $316,187 from the July figure of $331,836, but remained far short of the $1,354,288 total of August, 1939.

Imports during the first eight months of 1940 totaled 44,267 tons, valued at $3,367,590, 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 $6,685,937, 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 $227,486, or 36 per cent less than the August, 1939, figure of $329,874.

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 shipments, including the amount of foreign exchange received in payment.

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 included, 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 of 223,574 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, 74,839 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 158,604 tons and Canada 85,111 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 2080 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 $316,187 from the July figure of $331,836, but remained far short of the $1,354,288 total of August, 1939.

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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.

ORIGIN OF AUGUST IMPORTS

<table>
<thead>
<tr>
<th>Origin</th>
<th>Iron Ore</th>
<th>Pig Iron</th>
<th>Ferromanganese Ore</th>
<th>Ferrochrome</th>
<th>Sponge Iron</th>
<th>Ferromanganese</th>
<th>Ferroalloys</th>
<th>Other Ferroalloys</th>
<th>Other Wire</th>
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<td>113</td>
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<td>22</td>
<td>1</td>
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<td>5</td>
<td>267</td>
<td>12</td>
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<td>22</td>
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<td>267</td>
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<tr>
<td>India</td>
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<td>267</td>
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<td>267</td>
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<td>5</td>
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(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

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<td>2,864</td>
<td>2,948</td>
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2,089,107,110 steel and iron scrap exported in August.
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.

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, 1938. In gross tons:

<table>
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<th>District</th>
<th>Sept. 28</th>
<th>Change 1939</th>
<th>1938</th>
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<tr>
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<tr>
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</table>

P R O D U C T I O N . . . 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 bessemerers operating. Bessemer output is at about 80 per cent. An inerces 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 60, compared with 59 in June and 23 in July, 1939, according to the bureau of the census.
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.

While 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 62,000 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 about $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 department, 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, III., 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, Electro motive 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.
Another speaker pointed out that a diesel locomotive costs $60 per ton, that it "rode the curves better and was easier on the tracks."

Butt welded joints were recommended for blast furnace stoves by H. C. Boeeman, 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 need for tightening them, according to H. C. Koeper, welding superintendent, 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. Waller, 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 larger 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, W. R. Olchrist, 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 one 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.)

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

First Vice President


Second Vice President

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

Treasurer

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

Secretary

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

Past Presidents


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

Directors


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

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


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

R. K. Shewmaker, lubrication engineer, American Rolling Mill Co., Middletown, O.

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


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


P. F. Kinsey, assistant composition engineer, Bethlehem Steel Co., Laackawanna, 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 1 1/2 to 2 1/2 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 30 to 50 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 area, 50,000 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 amounting 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.

"Heredofore 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 employer-employee 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 "skill 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.
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 employment 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 employee 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 $331,491.

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-
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

TINNERMAN PRODUCTS, INC.
2039 FULTON ROAD
CLEVELAND, OHIO

MANUFACTURERS OF PATENTED SPEED NUTS

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.

Cabinet 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" 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 company, 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 practice 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 Canada $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, are now 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 microscopes, verniers, gages.

"Wages earned primarily engaged in manufacturing numbered 25,161 in 1939, a decrease of 23.5 per cent from 1937's total, 32,893. Wages, $4,134,606 last year, were 26.1 per cent less than the 1937 figure, $55,656,935. Value of the industry's products in 1939 was $125,630,124, compared with $162,062,009 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, 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 preliminary 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.
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 Hyatgs 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
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. 29. Initial contract calls for 6000 engines to be supplied to Britain and 30.0 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 seven experimental engines; three for Higgins Boat Co.; 81 for Electric Boat Co.; 72 for Canada; 1.0 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 structural awards awarded for the Chrysler plant. The Ford plant will require 6500 tons of piling and 8500 tons of structural metals 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. Industries 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...
steal is as 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 for quantities that they may need. 

Motor action 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 1,500 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 4,000 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".

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<tr>
<th>Year</th>
<th>Model year tool bill</th>
<th>Machinery equipment</th>
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<tbody>
<tr>
<td>1934</td>
<td>$1,226,394</td>
<td>3,156,685</td>
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<td>1935</td>
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<td>1941</td>
<td>$1,226,394</td>
<td>3,156,685</td>
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*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 buildings and equipment over the past eight years, which it calls the "price of success."
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.

NEW DEPARTURE

PIONEER OF THE SELF-SEALLED BEARING

September 30, 1940
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 conditions 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, Ohio, 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.
**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. Coomey, vice president and general manager, the William Powell Co., Cincinnati, has been elected to the board of directors, the Crossley 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.

**MEN of INDUSTRY**

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.

nitrogen, oxygen, and other gases, 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. Packard, 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.


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

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

**M. J. MCKEEVER**

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, III., 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. Packard, formerly of the Quickwork Co., will be chief engineer, and S. M. Steinko will have charge of advertising.

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September 30, 1940

33
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 businessmen 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 businessman and industrial executive.

Willkie cannot win alone.

E.C. Kreutzberg
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

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### Industry Set for Brisk Pace in October

### STEEL's Index of Activity

<table>
<thead>
<tr>
<th>Week Ended</th>
<th>1940</th>
<th>1939</th>
<th>1938</th>
<th>1937</th>
<th>1936</th>
<th>1935</th>
<th>1934</th>
<th>1933</th>
<th>1932</th>
<th>1931</th>
<th>1930</th>
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</thead>
<tbody>
<tr>
<td>July 13</td>
<td>108.5</td>
<td>87.8</td>
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<tr>
<td>July 20</td>
<td>105.0</td>
<td>86.0</td>
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<tr>
<td>July 27</td>
<td>103.4</td>
<td>89.8</td>
<td></td>
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<tr>
<td>Aug. 3</td>
<td>99.7</td>
<td>83.9</td>
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<tr>
<td>Aug. 10</td>
<td>98.5</td>
<td>83.9</td>
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<tr>
<td>Aug. 17</td>
<td>100.8</td>
<td>82.2</td>
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<td>Aug. 24</td>
<td>101.4</td>
<td>83.4</td>
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<td>Aug. 31</td>
<td>103.5</td>
<td>86.3</td>
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<tr>
<td>Sept. 7</td>
<td>98.7</td>
<td>83.7</td>
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<td></td>
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<td></td>
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<td></td>
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<tr>
<td>Sept. 14</td>
<td>114.9</td>
<td>97.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sept. 21</td>
<td>117.8</td>
<td>103.0</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### STEEL's Index of Activity Gained 2.9 Points to 117.8 in the Week Ended Sept. 21:

- **Steel**
  - Jan.: 114.7
  - Feb.: 115.8
  - March: 104.3
  - April: 102.7
  - May: 104.4
  - June: 114.1
  - July: 102.4
  - Aug.: 101.0
  - Sept.: 96.0
  - Oct.: 114.0
  - Nov.: 110.2
  - Dec.: 118.9

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The BUSINESS TREND
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

<table>
<thead>
<tr>
<th>Month</th>
<th>Aug., 1940</th>
<th>July, 1940</th>
<th>Aug., 1939</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Ingot Output</td>
<td>138.5</td>
<td>138.8</td>
<td>97.4</td>
</tr>
<tr>
<td>Pig Iron Output</td>
<td>141.2</td>
<td>135.4</td>
<td>96.3</td>
</tr>
<tr>
<td>Freight Movement</td>
<td>113.5</td>
<td>117.8</td>
<td>103.4</td>
</tr>
<tr>
<td>Building Construction</td>
<td>140.2</td>
<td>134.7</td>
<td>103.6</td>
</tr>
<tr>
<td>Wholesale Prices</td>
<td>100.4</td>
<td>100.8</td>
<td>97.3</td>
</tr>
<tr>
<td>Automobile Production</td>
<td>88.9</td>
<td>79.2</td>
<td>33.2</td>
</tr>
</tbody>
</table>

The Barometer of Business

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 $15,000 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.

Industrial Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Aug., 1940</th>
<th>July, 1940</th>
<th>Aug., 1939</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pig iron output (daily average, net tons)</td>
<td>136,599</td>
<td>139,984</td>
<td>96,122</td>
</tr>
<tr>
<td>Iron and steel scrap consumption (gross tons)</td>
<td>3,968,000</td>
<td>3,236,000</td>
<td>2,675,000</td>
</tr>
<tr>
<td>Gear sales index</td>
<td>191</td>
<td>141</td>
<td>96.0</td>
</tr>
<tr>
<td>Finished steel shipments (net tons)</td>
<td>1,455,604</td>
<td>1,296,887</td>
<td>865,689</td>
</tr>
<tr>
<td>Ingot output (average weekly, net tons)</td>
<td>1,361,850</td>
<td>1,265,833</td>
<td>957,561</td>
</tr>
</tbody>
</table>

The Barometer of Business

Financial Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Aug., 1940</th>
<th>July, 1940</th>
<th>Aug., 1939</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel's composite average of 25 iron and steel prices</td>
<td>$377.70</td>
<td>$376.64</td>
<td>$383.34</td>
</tr>
<tr>
<td>U. S. Bureau of Labor's index</td>
<td>77.4</td>
<td>77.7</td>
<td>35.0</td>
</tr>
<tr>
<td>Wheat, cash (bushel)</td>
<td>$0.90</td>
<td>$0.92</td>
<td>$0.84</td>
</tr>
<tr>
<td>Corn, cash (bushel)</td>
<td>$0.81</td>
<td>$0.79</td>
<td>$0.59</td>
</tr>
</tbody>
</table>

Commodity Prices

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 $15,000 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.
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, ½-inch; face width of cut, ¾-inch; revolutions per minute, 560; depth of cut, 0.150-inch; feed rate, 4½ inches per minute.

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

<table>
<thead>
<tr>
<th>Power (Watts)</th>
<th>Old Design</th>
<th>New Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Power</td>
<td>1300</td>
<td>1050</td>
</tr>
<tr>
<td>Idle Machine Power</td>
<td>900</td>
<td>900</td>
</tr>
<tr>
<td>Cutting Power</td>
<td>400</td>
<td>150</td>
</tr>
</tbody>
</table>

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 6⅞ inches whereupon the power consumption was only 250 watts. This was still 150 watts lower than the old mill at 4⅞-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.
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 ½-inch diameter, in regular 4-lip mills up to 1⅛-inch diameter. 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.

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...
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. The face is secured by the cutting action of a simple radius located at the outside diameter of the milling 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 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, 1/4-inch; revolutions per minute, 600; depth of cut, 1/16-inch; feed rate, 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 resharpening 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 the old mill was 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, 3/4-inch; revolutions per minute, 500; face width, 1/4-inch; feed, 3/8 inches per minute; depth of cut, 0.150 and 0.200-inch. The comparative turning force for 0.150-inch depth of cut for the old and new mills was:

<table>
<thead>
<tr>
<th>Power (Watts)</th>
<th>Old Design</th>
<th>New Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle Machine</td>
<td>1250</td>
<td>625</td>
</tr>
<tr>
<td>Cutting Power</td>
<td>1200</td>
<td>575</td>
</tr>
</tbody>
</table>

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 the 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 countertop 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 designed 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 1/4-inch; revolutions per minute, 900; depth of cut, 3/32-inch; feed, starting at 1/4-inch 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 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 is apparent that a cutting action 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.

Pressure 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 give as satisfactory performance as one operating from a spindle having proper adjustment.

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 adaptors, 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 generated by cutting tools. This material is packaged in one and 5-gallon and drum containers.

**Convenient 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.
EXCEPTIONAL RESILIENCY MAKES NEW BUS DESIGN POSSIBLE . . . .

In designing their new line of Flxible Clippers, the Flxible Company of Loudonville, Ohio, cut down dead weight by eliminating the chassis and made the body members carry the load. Regular carbon steel frame members were too heavy and permanent distortion much too likely. The resiliency of Yoloy, and the money saving qualities of less weight for a given strength, combined with a higher corrosion resistance made this possible.

When road conditions tend to distort the bus body and a sudden hard shock stresses the members, the resiliency of Yoloy eliminates the permanent "set" which might occur through the use of regular carbon steels. Yoloy retains its original position and the alignment of the body is maintained -- making the new bus design a complete success.

In railroads, busses, mine cars, trucks, in whatever transportation equipment you build, Yoloy can save weight, increase strength and save money in haulage costs for your customers.

Yoloy High Tensile Steel is available in sheets, strips, plates, bars, shapes, manufacturer's wire, welding wire, seamless pipe, and electric weld pipe.

*
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 embrittlement 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 quenching.

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, Fe₃C, 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 quenchent. 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, O₂, 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, 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, O₂, 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, Fe₃O₅, 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
Precision is Assured IN A SOUTH BEND LATHE

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

SUPERFINISHED SPINDLE is made of alloy steel with bearing surfaces carburized, hardened, ground and superfinished.

IMPROVED SADDLE and compound rest with adjustable tapered gibbs. Cross slide bridge provides rigid support for the tool rest.

DOUBLE WALL APRON is rigid box type construction with all steel gears running in oil bath.

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

UNDERNEATH MOTOR DRIVE. Belt drive to spindle is smooth and powerful and provides a wide range of spindle speeds.

Precision is assured in South Bend Lathes by combining fine workmanship with sound machine design. Expert mechanics, skilled by years of experience, fit and test each unit with a degree of exactness known only to the machine tool builder.

South Bend Lathes are used in the tool and gauge departments of nationally known manufacturers for the most exacting classes of precision work. They are also used for production operations on interchangeable parts requiring a high degree of accuracy. Conveniently located controls assure an ease of operation which reduces operator fatigue, resulting in a uniformly efficient rate of production over a long period of time.

South Bend Lathes are manufactured in over 65 sizes and types. Popular sizes are available for prompt delivery from dealer display stocks in important cities throughout the world. Made in 9", 10", 13", 14½", and 16" swing, in 3' to 12' bed lengths, in Countershaft and Motor Drives.

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Boston, Mass.—South Bend Lathe Works
Bridgeport, Conn.—A. C. Bisgood
Chicago, Ill.—South Bend Lathe Works
Cleveland, Ohio—Reynolds Machinery Co.
Detroit, Mich.—Lee Machinery Company
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Milwaukee, Wis.—W. A. Voell Machinery Co.
Newark, N. J.—J. R. Edwards Machinery Co.
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Philadelphia, Pa.—W. B. Rapp, Machinery
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SOUTH BEND LATHE WORKS
LATHE BUILDERS SINCE 1906
816 E. Madison St., South Bend, Ind., U.S.A.
EFFECT OF SKIN PASSES AT ROOM TEMP. AND AT 150° F. ON THE DRAWING QUALITIES OF SHEET STEEL

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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
You can't afford to miss the biggest National Metal Exposition and Congress in History.

Be sure to attend the biggest National Metal Exposition and Metal Congress in history at Cleveland this year. More than 2,750 exhibits will be on display and in actual operation at the Exposition — an opportunity to see and examine every new development in the metal industry.

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You owe it to yourself and to the advancement of your company’s welfare to attend this great annual event. Make your hotel reservations today to insure best accommodations.

A complete program of technical sessions and list of exhibits will be available for distribution about October 1st. Write for your copy to the American Society for Metals, 7301 Euclid Avenue, Cleveland, Ohio.

COOPERATING SOCIETIES
American Society for Metals; American Welding Society; The Wire Association; Iron and Steel Division and Institute of Metals Division, American Institute of Mining & Metallurgical Engineers.

NATIONAL METAL EXPOSITION
AND METAL CONGRESS
Cleveland, Ohio
OCTOBER 21-25, 1940
Managed by American Society for Metals
physical values. Holding the hot strip between the roughing unit and the finishing train also promotes 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 Fah., 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>
<thead>
<tr>
<th>Rockwell</th>
<th>Olsen, inches</th>
<th>Elastic limit, p.s.i.</th>
<th>Tensile strength, p.s.i.</th>
<th>Elongation 2&quot;</th>
<th>Performance good broke</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-47</td>
<td>0.425</td>
<td>30,835</td>
<td>42,145</td>
<td>51.0</td>
<td>40.5, 31.0</td>
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<tr>
<td>44-45</td>
<td>0.420</td>
<td>38,770</td>
<td>43,200</td>
<td>53.0</td>
<td>40.5, 32.0</td>
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<tr>
<td>40-39</td>
<td>0.420</td>
<td>31,875</td>
<td>45,105</td>
<td>59.0</td>
<td>45.0, 33.7</td>
</tr>
<tr>
<td>40-38</td>
<td>0.428</td>
<td>32,375</td>
<td>43,625</td>
<td>53.0</td>
<td>43.0, 33.7</td>
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<tr>
<td>46-48</td>
<td>0.418</td>
<td>32,100</td>
<td>45,605</td>
<td>52.0</td>
<td>42.0, 32.5</td>
</tr>
<tr>
<td>43-42</td>
<td>0.425</td>
<td>39,420</td>
<td>45,965</td>
<td>54.0</td>
<td>42.0, 31.5</td>
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<tr>
<td>38-40</td>
<td>0.427</td>
<td>30,530</td>
<td>45,875</td>
<td>57.0</td>
<td>45.0, 32.5</td>
</tr>
<tr>
<td>47-45</td>
<td>0.414</td>
<td>31,565</td>
<td>46,105</td>
<td>51.0</td>
<td>40.0, 30.5</td>
</tr>
<tr>
<td>46-47</td>
<td>0.423</td>
<td>32,110</td>
<td>45,605</td>
<td>52.0</td>
<td>42.0, 32.2</td>
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<tr>
<td>42-40</td>
<td>0.433</td>
<td>33,915</td>
<td>46,255</td>
<td>57.0</td>
<td>44.0, 34.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin pass temp. °F.</th>
<th>Test</th>
<th>Rockwell scale B</th>
<th>Olsen Gage</th>
<th>Elongation 2&quot;</th>
<th>Performance good broke</th>
</tr>
</thead>
<tbody>
<tr>
<td>150-250</td>
<td>L</td>
<td>49-51-51</td>
<td>0.400</td>
<td>0.039</td>
<td>36,100</td>
</tr>
<tr>
<td>70-80</td>
<td>L</td>
<td>43-43-44</td>
<td>0.426</td>
<td>0.041</td>
<td>30,700</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td></td>
<td>0.041</td>
<td>30,800</td>
<td>45,300</td>
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</table>

<table>
<thead>
<tr>
<th>Skin pass temp. °F.</th>
<th>Test</th>
<th>Rockwell scale B</th>
<th>Olsen Gage</th>
<th>Elongation 2&quot;</th>
<th>Performance good broke</th>
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</thead>
<tbody>
<tr>
<td>150-250</td>
<td>L</td>
<td>52-53-54</td>
<td>0.391</td>
<td>0.039</td>
<td>39,000</td>
</tr>
<tr>
<td>70-80</td>
<td>L</td>
<td>47-48-48</td>
<td>0.419</td>
<td>0.041</td>
<td>32,900</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td></td>
<td>0.041</td>
<td>33,400</td>
<td>45,800</td>
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<td>0.419</td>
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<td>32,900</td>
</tr>
<tr>
<td></td>
<td>T</td>
<td></td>
<td>0.041</td>
<td>33,400</td>
<td>45,800</td>
</tr>
</tbody>
</table>

*Longitudinal. †Transverse.
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 and still do this difficult draw. No. 4 after aging show that they can be far inferior to the original and still do this difficult draw. No. 4 after aging show that they can be far inferior to the original and still do this difficult draw.

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. The last sample with six of 15 sheets allowed to cool to room temperature before skin passing. This is approximately 70 hours, that is, the change takes place rapidly and is practically complete in 70 hours.

The detrimental effects of skin pass- 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)
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 consumers that manufacturers give more facts about their products.

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.

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“EXTRA ADVANTAGE” LABEL

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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, Max-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.
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 directly 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...
B&W INSULATING CONCRETE

B&W Concrete Mix is a lightweight 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.

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.
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 muffe 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 telltale, 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.I.U. gas, tests show that 440 cubic feet are required to bring the furnace up to 1450 degrees Fahr., after a weekend 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 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 photoelectric 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 fooling the electric eye. Photo courtesy Fairbanks Morse & Co., 600 South Michigan avenue, Chicago.
"Ferro-Alloys
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.

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 effort is, therefore, doubly pronounced. The efficiency 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

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 chinin' 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 y'?

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 — I'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 scisin' 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 labatory 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 y'ud 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 someway 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 brickyard 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 winter time 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—I 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—just 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. Finin' boilers is out of sight, but if the steam pressure falls—well y' sure are to jack 'em up over at the boiler house. Getting ore to the top of the mill is out of sight, but if the little skip car stops runnin' you're the feller in the stockhouse jumpin' on the boys runnin' the larry car. Puttin' a linin' in the open hearth is out of sight but if y' don't see the stacks spittin' fumes y' want to know what the h—is 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 just as Charlie told 'im. The men 'round the mill sensed the change. The grapevine started buzzin' and '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.
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 com-
ments come from hard boiled operat-
ing men who have already proved
Trantinyl's outstanding merits. At
first skeptics, now they say, "The
mills ought to beg you for your stuff".
"We used to
change guides sev-
eral 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
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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 Tran-
tinyl guides you'll never switch. How
to be happy and keep "Mahogany
Row" happy too—lower your costs,—
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taneously boost your tonnage with
Trantinyl. It should sell by the
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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.

By A. L. Wilkinson
Leland-Gifford Co.
1001 Southbridge Street

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

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

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 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 maximum 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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September 30, 1940
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 locking 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. 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 on 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-
side one already in position. Clearances are small. No crane or lift platforms are used. The method provides a neat compact arrangement in space; measure of 50 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 ¼-inch to ½-inch and 1/16 to ½-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 refiners, as friction roll coverings for business machines and recording instruments and large photographic developing and printing plants.

Annoounces 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 production 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.

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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 clean it. No extra charge is made for Lubriflush if specified on your order.

SEND FOR BULLETIN
An interesting Bulletin describing the new U. S. Lubriflush system in comparison with ordinary motor bearing lubrication will be mailed on request. Mail the coupon.
**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 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 chambers, 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 1½ inches in thickness the weld will be approximately 1 inch in diameter near the surface with the diameter about 50 per cent larger as it approaches the mid-
Many New Standards Approved by Society for Testing Materials

AS A result of discussion and information brought out at the 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 chromi-um-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 75,000 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-silver alloys in any form commercially known as soft solder and designation 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 specifications covered clay and concrete pipe, masonry units, road and paving materials, roofing materials, glass products and glass, electric insulating material. For details on these or other specifications mentioned, refer to American Society for Testing Materials, 260 South Broad street, Philadelphia.

Steel Corrosion Data
Put in Popular Form

Corrosion of Iron and Steel, by J. C. Hudson: 319 pages, 5% x 8% 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. Swindlen, 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; protection of rusting by means of paints; protective coatings; rusting of iron and steel immersed in seawater; 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, consisting of a 2 to 4 minute dip in a solution known as PreFyf5. This is a general account of the process; rusting of unprotected iron and steel in the atmosphere; protection of rusting by means of paints; protective coatings; rusting of iron and steel immersed in seawater; rusting of iron and steel in other fields of service; what remains to be done in preventing rusting.

September 29, 1940
or loose metal is removed from the areas to be built up. This is accomplished by means of a oxy-acetylene 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 3/4 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 Amso nickel-manganese steel, containing 3 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 more dense, smooth and close to dimensions to the 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 3/16-inch wide and 3/16-inch deep, as indicated on Fig. 1.

In the case the part is of the Hadfield steel rolling mill equipment, 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.

The procedure for reclaiming the excesses of the build-up areas follows that of the spindles and crabs insofar as preparation, peening and general welding practice is concerned. The initial build-up material, however, should be nickel-manganese steel, which is applied to within 3/4-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 3/4-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-

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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.

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.

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

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 1/4 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 2/4 inches, adjustable at both ends. The second motion is a cam-driven constant-speed, quick-reversal reciprocating motion, adjustable from 1/64 to 1/4-inch. A special tracer desig-
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 advantage of expert supervision and 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 advantage 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 corporate double reduction and varidrive speed design. These advantages of expert supervision and seams, dents and leakers in welds. 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 ½-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 employed which carry the bearings directly behind the disks. The bearing construction has been improved, as has the method of lubrication. Oiler units 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. Having a 16,000-pound capacity, it features front wheel drive and trail wheel steel. It is built for tilting or nonlifting, 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 22½ 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 structural steel for drydocks, hangars and other facilities. In addition, bids have been opened on 65,000 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 95,990 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 Bonneville dam.

• Ford Motor Co. has placed 9000 tons of structural steel 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 85,990 cars and trucks, almost 50 per cent above the 64,385-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 $21.45. 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 steel making rate held at 93 per cent. Losses of 2 1/2 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 88 1/2, Wheeling at 97, Buffalo at 90 1/2 and eastern Pennsylvania at 92.

September 30, 1940
### COMPARISON OF PRICES

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

<table>
<thead>
<tr>
<th>Finished Material</th>
<th>Sept. 28</th>
<th>Aug. 1940</th>
<th>Sept. 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel bars, Pittsburgh</td>
<td>2.15c</td>
<td>2.15c</td>
<td>2.15c</td>
</tr>
<tr>
<td>Steel bars, Philadelphia</td>
<td>2.15</td>
<td>2.15</td>
<td>2.15</td>
</tr>
<tr>
<td>Iron bars, Chicago</td>
<td>2.90</td>
<td>2.90</td>
<td>2.90</td>
</tr>
<tr>
<td>Shapes, Pittsburgh</td>
<td>2.15</td>
<td>2.15</td>
<td>2.15</td>
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<tr>
<td>Shapes, Philadelphia</td>
<td>2.15</td>
<td>2.15</td>
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<tr>
<td>Shapes, Chicago</td>
<td>2.10</td>
<td>2.10</td>
<td>2.10</td>
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<tr>
<td>Plates, Pittsburgh</td>
<td>2.15</td>
<td>2.15</td>
<td>2.15</td>
</tr>
<tr>
<td>Plates, Philadelphia</td>
<td>2.15</td>
<td>2.15</td>
<td>2.15</td>
</tr>
<tr>
<td>Sheets, hot-rolled, Gary</td>
<td>2.05</td>
<td>2.05</td>
<td>2.05</td>
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<tr>
<td>Sheets, cold-rolled, Pittsburgh</td>
<td>2.05</td>
<td>2.05</td>
<td>2.05</td>
</tr>
<tr>
<td>Sheets, No. 24 galv., Pittsburgh</td>
<td>2.05</td>
<td>2.05</td>
<td>2.05</td>
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<tr>
<td>Sheets, cold-rolled, Gary</td>
<td>2.05</td>
<td>2.05</td>
<td>2.05</td>
</tr>
<tr>
<td>Sheets, No. 24 galv., Gary</td>
<td>2.05</td>
<td>2.05</td>
<td>2.05</td>
</tr>
<tr>
<td>Bright bars, basic wire, Pitts.</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Tin plate, per base box, Pitts.</td>
<td>$5.00</td>
<td>$5.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Wire nails, Pittsburgh</td>
<td>2.55</td>
<td>2.55</td>
<td>2.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semifinished Material</th>
<th>Sept. 28</th>
<th>Aug. 1940</th>
<th>Sept. 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet bars, Pitts., Chicago</td>
<td>$34.00</td>
<td>$34.00</td>
<td>$34.00</td>
</tr>
<tr>
<td>Slabs, Pitts., Chicago</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
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<tr>
<td>Rolling billets, Pitts.</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Wire rods No. 5 to 1/2-Inch, Pitts.</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
</tbody>
</table>

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Hot Rolled</td>
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<tr>
<td>Pittsburgh</td>
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<tr>
<td>Chicago, Gay</td>
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<tr>
<td>Cleveland</td>
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<tr>
<td>Detroit, del.</td>
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<tr>
<td>Buffalo</td>
</tr>
<tr>
<td>Sparrows Point, Md.</td>
</tr>
<tr>
<td>New York, del.</td>
</tr>
<tr>
<td>Philadelphia, del.</td>
</tr>
<tr>
<td>Granite City, Ill.</td>
</tr>
<tr>
<td>Middletown, O.</td>
</tr>
<tr>
<td>Youngstown, O.</td>
</tr>
<tr>
<td>Birmingham</td>
</tr>
<tr>
<td>Pacific Coast ports</td>
</tr>
<tr>
<td>Cold Rolled</td>
</tr>
<tr>
<td>Pittsburgh</td>
</tr>
<tr>
<td>Chicago, Gay</td>
</tr>
<tr>
<td>Buffalo</td>
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<tr>
<td>Cleveland</td>
</tr>
<tr>
<td>Detroit, delivered</td>
</tr>
<tr>
<td>Philadelphia, del.</td>
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<tr>
<td>New York, del.</td>
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<tr>
<td>Granite City, Ill.</td>
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<tr>
<td>Middletown, O.</td>
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<tr>
<td>Youngstown, O.</td>
</tr>
<tr>
<td>Pacific Coast ports</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Galvanized No. 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pittsburgh</td>
</tr>
<tr>
<td>Chicago, Gay</td>
</tr>
<tr>
<td>Buffalo</td>
</tr>
<tr>
<td>Sparrows Point, Md.</td>
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<tr>
<td>Philadelphia, del.</td>
</tr>
<tr>
<td>New York, delivered</td>
</tr>
<tr>
<td>Birmingham</td>
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</table>

<table>
<thead>
<tr>
<th>Composite Market Averages</th>
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</thead>
<tbody>
<tr>
<td>Sept. 28</td>
</tr>
<tr>
<td>Iron and Steel</td>
</tr>
<tr>
<td>Steelworks Scrap</td>
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</table>

<table>
<thead>
<tr>
<th>Steel Plate</th>
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</thead>
<tbody>
<tr>
<td>Pittsburgh</td>
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<tr>
<td>New York, del.</td>
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<tr>
<td>Philadelphia, del.</td>
</tr>
<tr>
<td>Boston, delivered</td>
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<tr>
<td>Chicago</td>
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<tr>
<td>Detroit, delivered</td>
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<thead>
<tr>
<th>Structural Shapes</th>
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</thead>
<tbody>
<tr>
<td>Pittsburgh</td>
</tr>
<tr>
<td>Chicago</td>
</tr>
<tr>
<td>Detroit, delivered</td>
</tr>
<tr>
<td>Cleveland</td>
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</tbody>
</table>

### COMPARISON OF PRICES

**Steel, Iron, Raw Material, Fuel and Metals Prices**

*Except when otherwise designated, prices are base, f.o.b. cars.*

**Sheet Steel**

- **Hot Rolled**
  - Pittsburgh: $2.10c
  - Chicago: $2.10c
  - Cleveland: $2.10c
  - Detroit: $2.20c
  - Buffalo: $2.10c
  - Sparrows Point, Md.: $2.10c
  - New York: $2.84c
  - Philadelphia, del.: $2.27c
  - Granite City, Ill.: $2.05c
  - Middletown, O.: $2.10c
  - Youngstown, O.: $2.10c
  - Birmingham: $2.10c
  - Pacific Coast ports: $2.65c

- **Cold Rolled**
  - Pittsburgh: $3.05c
  - Chicago: $3.05c
  - Buffalo: $3.05c
  - Cleveland: $3.05c
  - Detroit, delivered: $3.15c
  - Philadelphia, del.: $3.57c
  - New York, del.: $3.38c
  - Granite City, Ill.: $3.35c
  - Middletown, O.: $3.05c
  - Youngstown, O.: $3.05c
  - Pacific Coast ports: $3.70c

**Galvanized No. 24**

- Pittsburgh: $3.50c
- Chicago, Gay: $3.50c
- Buffalo: $3.50c
- Sparrows Point, Md.: $3.50c
- Philadelphia, del.: $3.57c
- New York, delivered: $3.74c
- Birmingham: $3.50c

**Composite Market Averages**

- Sept. 28: $37.96
- Aug. 1940: $37.96
- Sept. 14: $37.94

**Steel Plate**

- Pittsburgh: 2.10c
- New York, del.: 2.15c
- Philadelphia, del.: 2.15c
- Boston, delivered: 2.10c
- Buffalo, delivered: 2.10c
- Chicago: 2.15c
- Detroit, delivered: 2.15c

**Corrosion and Heat-Resistant Alloys**

- *Pittsburgh, Gery*
  - Black Plate, No. 20 and Lighter: 2.75c
  - Pittsburgh: 2.75c
  - Chicago, Gay: 2.75c
  - Granite City, Ill.: 3.15c
  - Long Termers No. 34 Unassorted: 2.75c
  - Pittsburgh, Gery: 3.05c
  - Pacific Coast: 4.55c

- Enameling Sheets
  - No. 10: 2.15c
  - No. 10: 2.10c

**Steel Floor Plates**

- Pittsburgh: 3.35c
- Chicago: 3.35c
- Gulf ports: 3.70c
- Pacific Coast ports: 3.00c

**Tin and Terne Plate**

- Tin Plate, Coke (base box)
  - Pittsburgh, Gay, Chicago: $3.90
  - Granite City, Ill.: $1.00

**Bars**

- (Base, 20 tons or over)
  - Pittsburgh: 2.15c
  - Chicago, Gay or Cary: 2.15c
  - Duluth: 2.25c
  - Shippensburg: 2.15c
  - Cleveland: 2.15c
  - Buffalo: 2.15c
  - Chicago or Cary: 2.10c
  - Rolls, delivered, Detroit: 2.25c
  - Buffalo, delivered: 2.25c
  - Chicago or Cary: 2.10c
  - Cleveland: 2.10c
  - Buffalo, delivered: 2.10c
  - Chicago or Cary: 2.10c
  - Cleveland: 2.10c
  - Buffalo, delivered: 2.10c
  - Chicago or Cary: 2.10c
  - Birmingham: 2.10c
  - Claymont, Del.: 2.10c
  - Sporswall Point, Md.: 2.10c
  - Middletown, O.: 2.10c
  - Youngstown: 2.10c
  - Pacific Coast ports: 2.10c

**Structural Shapes**

- Pittsburgh: 2.10c
- Philadelphia, del.: 2.15c
- New York, delivered: 2.15c
- Boston, delivered: 2.10c
- Bethlehem: 2.10c
- Chicago: 2.15c
- Cleveland, del.: 2.10c
- Buffalo: 2.10c

**Ball Steel**

- (Base, 5 tons or over)
  - Pittsburgh: 2.05c
  - Chicago or Gary: 2.05c
  - Detroit, delivered: 2.15c
  - Cleveland: 2.00c
### The Market Week—

| **Buffalo** | 2.05c |
| **Birmingham** | 2.05c |
| **Gulf ports** | 2.40c |
| **Pacific Coast ports** | 2.70c |
| **Chicago** | 2.20c |
| **Pittsburgh, refined** | 3.50-3.80c |
| **Terre Haute, Ind.** | 2.15c |

#### Relicensing

- **New England Base**
  - Chicago, Gary, Buffalo, Cleveland, Boston, Sparrows Pt., Pitts., 2.15c
- **Gulf ports** | 2.70c |
- **Pacific Coast ports** | 2.75c |
- **Detroit** | 2.75c - 3.45c |
- **Cleveland** | 2.65c - 3.35c |
- **2,000** | 0.35c |
- **5,000** | 0.80 - 0.90c |
- **Chicago** | 2.65c - 3.35c |
- **Spring wire** | 3.20c |

#### Cold-Finished Bars

| **Carbon** | 5.35c |
| **Alloy Steel** | 5.35c |
| **Detroil** | 2.75c - 3.45c |
| **Cleveland** | 2.65c - 3.35c |
| **Baltimore** | 2.85c - 3.35c |

#### Cut Nails

| **Carload, Pittsburgh, week** | 3.85c |

#### Alloy Bars (Hot)

| **Base, 20 tons or over** | Pittsburgh, Buffalo, Chi., Cago, Massillon, Canton, Bethlehem | 2.70c |
| **Detroit, delivered** | 2.85c |

#### Bolts and Nuts

| **Angrebars, Pitts., Chi., Balt., Buffalo** | 2.70c |
| **Chicago, Detroit** | 2.75c |
| **Cleveland** | 2.65c |
| **Baltimore** | 2.85c - 3.35c |

#### Boiler Tubes

| **Carloads minimum wall seamless steel boiler tubes, cut length 4 to 24 feet; f.o.b. Pitts., basic price per 100 feet subject to usual extras.** |

#### Coke

| **Price Per Net Ton** | **Beehive Ovens** |
| **Connecticut, sea port** | 45c - 50c |
| **Maryland, Del., Va.** | 55c - 60c |
| **Penn., Md., W. Va., Del.** | 60c - 65c |
| **New York, N. J.** | 75c - 80c |
| **Two degree** | 27.50c |

#### Cast Iron Pipe

| **Class B Pipe—Net** | **Birm., 4-in., & over, 4.25c; 5-in., & over, 4.50c** |
| **Birm., 4-in., & over, 4.25c** | 4-in., & over, 4.50c |
| **Birm., 5-in., & over, 4.50c** | 5-in., & over, 4.50c |
| **Birm., 6-in., & over, 5.00c** | 6-in., & over, 5.00c |
| **Birm., 8-in., & over, 5.75c** | 8-in., & over, 5.75c |
| **Birm., 10-in., & over, 6.50c** | 10-in., & over, 6.50c |
| **Birm., 12-in., & over, 7.25c** | 12-in., & over, 7.25c |

**The Market Week—**

| **Strip and Hoops** |
| **Hot Strip, 12-inch and less** |
| **Chicago, Cinc., Cleveland, Youngstown, Middle- town, Pittsburgh, Del., Philad., Buf., Det., Clevel., Youngstown, Chi., Pitts., Det., Det., Del., Del., Mass.** |
| **Cold strip, 0.25 carbon and under** |
| **Spring wire** |

### Wire Products

| **Per Pound** |
| **Galv. Barbed Wire, 80-rd. Spools, BaSe Column** |
| **Galv. Barbed Wire, 80-rd. Spools, Base Column** |

| **Wire Products** |
| **Wire, Galv., Spring Flats** |
| **Carbon, Cleve., Pitts., 0.26—0.50** |

### Rails, Fastenings

| **Standard rails, mill** |
| **Railax drills, Pittsburgh** |
| **Light rails, billet quali** |

### Cold-Finished Bars

- **Carbon:** 2.65c - 3.35c
- **Alloy Steel:** 5.35c
- **Detroil:** 2.75c - 3.45c
- **Cleveland:** 2.65c - 3.35c
- **Baltimore:** 2.85c - 3.35c

### Cast Iron Pipe

- **Class B Pipe—Net**
- **Birm., 4-in., & over, 4.25c; 5-in., & over, 4.50c**
- **Birm., 4-in., & over, 4.25c**
- **Birm., 5-in., & over, 4.50c**
- **Birm., 6-in., & over, 5.00c**
- **Birm., 8-in., & over, 5.75c**
- **Birm., 10-in., & over, 6.50c**
- **Birm., 12-in., & over, 7.25c**

### Semifinished Steel

- **Bolting Billets, Slabs (Gross Tons)**
- **Forging Quality Billets**
- **Sheet Bars**
- **Rods**

### Coke

- **Price Per Ton**
- **Beehive Ovens**
- **Connecticut, sea port**
- **Maryland, Del., Va.**
- **Penn., Md., W. Va., Del.**
- **New York, N. J.**
- **Chicago, outside del.**
- **Terrace Haute, del.**
- **Milwaukee, del.**
- **New England, del.**
- **Indianapolis, del.**
- **Cincinnati, del.**
- **Cleveland, del.**
- **Detroit, del.**
- **Philadelphia, del.**

### Coke By-Products

- **Spot, del.**
- **Toluol, two degree**
- **Solvent naphtha**
- **Industrial xylol**
- **Phenol (less than 1000 bbls.)**
- **Sulphate of ammonia**

---

**September 30, 1940**
### Pig Iron
Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 20c diff. for each 0.05 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

<table>
<thead>
<tr>
<th>Basing Points:</th>
<th>No. 2 Malle-</th>
<th>Bessemer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bethlehem, Pa.</td>
<td>$24.00</td>
<td>$24.00</td>
</tr>
<tr>
<td>Birmingham, Ala.</td>
<td>$19.38</td>
<td>19.38</td>
</tr>
<tr>
<td>Binghampton, Pa.</td>
<td>$24.00</td>
<td>24.00</td>
</tr>
<tr>
<td>Boston, Mass.</td>
<td>$24.00</td>
<td>24.00</td>
</tr>
<tr>
<td>Cleveland, Ohio</td>
<td>$23.00</td>
<td>23.50</td>
</tr>
<tr>
<td>Detroit, Mich.</td>
<td>$23.00</td>
<td>23.50</td>
</tr>
<tr>
<td>Duluth, Minn.</td>
<td>$23.50</td>
<td>23.50</td>
</tr>
<tr>
<td>Erie, Pa.</td>
<td>$23.00</td>
<td>23.50</td>
</tr>
<tr>
<td>Everett, Wash.</td>
<td>$24.50</td>
<td>24.50</td>
</tr>
<tr>
<td>Granite City, Ill.</td>
<td>$23.00</td>
<td>22.50</td>
</tr>
<tr>
<td>Hamilton, O.</td>
<td>$23.00</td>
<td>23.50</td>
</tr>
<tr>
<td>Neville Island, Pa.</td>
<td>$23.00</td>
<td>23.50</td>
</tr>
<tr>
<td>Provo, Utah</td>
<td>$22.00</td>
<td>22.00</td>
</tr>
<tr>
<td>Sharpsville, Pa.</td>
<td>$23.00</td>
<td>22.50</td>
</tr>
<tr>
<td>Sparrow’s Point, Md.</td>
<td>$23.00</td>
<td>22.50</td>
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<tr>
<td>Svedeland, Pa.</td>
<td>$24.00</td>
<td>24.50</td>
</tr>
<tr>
<td>Toledo, O.</td>
<td>$23.00</td>
<td>23.50</td>
</tr>
<tr>
<td>Youngstown, O.</td>
<td>$23.00</td>
<td>22.50</td>
</tr>
</tbody>
</table>

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

Delivered from Basing Points:
- Akron, O. from Cleveland...
- Baltimore from Richmond...
- Boston from Birmingham...
- Boston from Everett, Mass...
- Boston from Buffalo...
- Brooklyn, N. Y. from Bethlehem...
- Canton, O. from Cleveland...
- Chicago from Birmingham...
- Cincinnati from Hamilton, O....
- Cincinnati from Cleveland...
- Cleveland from Cleveland...
- Hamilton, O. from Toledo, O....
- Muskegon, Mich., from Chicago...
- Toledo or Detroit...
- Newark, N. J. from Birmingham...
- Newark, N. J. from Bethlehem...
- Philadelphia from Bethlehem...
- Pittsburgh district from Neville...
- Pittsburgh district from New York...
- Saginaw, Mich., from Detroit...
- St. Louis, southern...

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

<table>
<thead>
<tr>
<th>Fire Clay Brick</th>
</tr>
</thead>
<tbody>
<tr>
<td>Super Quality</td>
</tr>
<tr>
<td>Pa., Mo., Ky.</td>
</tr>
<tr>
<td>First Quality</td>
</tr>
<tr>
<td>Pa., Ill., Mo., Ky., Va., Ala., Ga.</td>
</tr>
<tr>
<td>Second Quality</td>
</tr>
<tr>
<td>Miss.</td>
</tr>
</tbody>
</table>

### Manganese

| Manganese, 74-82% carlots, duty paid... | $120.00 |
| Ton lots | 130.00 |
| Less ton lots | 113.50 |
| Less 200 lb. per ton | 115.00 |
| Less carlots, del. Pitts. | 127.53 |

### Silicon Carbide

| Silicon, 50% freight allowed, c.i.f. | 74.50 |
| Do., ton lots | 87.00 |
| Do., 75 per cent | 135.00 |
| Do., ton lots | 151.00 |
| Spot, $5 a ton higher | |

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| Silicon, 50% freight allowed, c.i.f. | 74.50 |
| Do., ton lots | 87.00 |
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<tr>
<th>Ferroalloy Prices</th>
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<tbody>
<tr>
<td>The Market Week</td>
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<td>—</td>
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</tr>
</tbody>
</table>

### Technical Molybdenum

| Technical molybdenum trioxide, 52 to 60% mol- | $1.10 |
| Do., 3rd grade | 1.00 |

### Chromium Briquettes

| Chromium Briquettes, contract, freight allowed, | |
| Do., spot, carloads, bulk, spot, tons, & | |
| Do., less ton lots | 7.00 |

### Molybdenum Powder

| Molybdenum Powder, 99%, f.o.b. Yorke, Pa., 200-lb. kegs, | 2.00 |
| Do., 500-lb. lots | 2.90 |
| Do., under 100-lb. lots | 3.00 |

### Molybdenum Oxide

| Molybdenum Oxide, 38-48%, f.o.b.condition, per pound contained, | 80.00 |
## WAREHOUSE STEEL PRICES

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

<table>
<thead>
<tr>
<th>Soft Bars</th>
<th>Bands</th>
<th>Hoops</th>
<th>Plates</th>
<th>Sheets</th>
<th>Hot Rolled</th>
<th>Cold Rolled</th>
<th>Cold Drawn Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>3.08</td>
<td>3.05</td>
<td>4.60</td>
<td>3.31</td>
<td>4.76</td>
<td>4.00</td>
<td>3.75</td>
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<tr>
<td>New York</td>
<td>3.08</td>
<td>3.05</td>
<td>4.60</td>
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<td>4.76</td>
<td>4.00</td>
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<td>4.00</td>
<td>3.75</td>
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<td>Norfolk, Va</td>
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<td>4.76</td>
<td>4.00</td>
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<td>3.31</td>
<td>4.76</td>
<td>4.00</td>
<td>3.75</td>
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</table>

### BASE QUANTITIES


- **Cold Rolled Sheets**: Base, 400-1999 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 1500-2499 in Boston; 1000-1999 in Philadelphia; 200-4999 in San Francisco; 300-1999 pounds in Kansas City; 400-1999 pounds in Milwaukee, Omaha, St. Louis, Tulsa; 1000 and over in Chattanooga: any quantity in Twin Cities; 300-1999 pounds in Los Angeles.

- **Galvanized Sheets**: Base, 1500-3499 pounds; New York: 1500-1999 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1999 in Los Angeles; 1000-1999 in Portland, Seattle, St. Louis; 1000 and over in Cincinnati, Kansas City; 300-1999 pounds in Twin Cities; 750-1999 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 400-1999 pounds in Los Angeles; 300-1999 pounds in Portland, Seattle, San Francisco; 450-3749 pounds in Memphis.

- **Cold Rolled Strips**: No base quantity; extras apply on lots of all sizes.

- **Cold Finished Bars**: Base, 1500 pounds and over on carbon, except 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 0-6999, San Francisco; 0-1999, Portland, Seattle.

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### EXPORT PRICES f.o.b. PORT OF DISPATCH

**Dollars at Official Rates of Exchange**

**Domestic Prices at Works or Furnaces**

**Usd** | **French Franc** | **Belgian Franc**
---|---|---
**Per ft. in 22 ga.** | $24.24 | 330.25 | 330.25
**Size 3 to 8 in.** | 22.53 | 300.39 | 300.39
**Bare or heavy plate, 300-1499 lbs.** | 22.53 | 300.39 | 300.39
**S.A.E. 1035-1050 Bars** | 22.53 | 300.39 | 300.39

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**Burban & Steel, New York, Sept. 23-24, 1939**

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**British Iron and Steel Report, 1940:**

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**September 30, 1940**
### HEAVY MELTING STEEL

<table>
<thead>
<tr>
<th>Location</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffalo</td>
<td>13.50-14.00</td>
</tr>
<tr>
<td>Chicago</td>
<td>12.50-13.00</td>
</tr>
<tr>
<td>Cincinnati, dealers</td>
<td>9.50-10.00</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>4.00-4.50</td>
</tr>
<tr>
<td>New York</td>
<td>19.00-19.50</td>
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<tr>
<td>Pittsburgh</td>
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<tr>
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### MACHINE TURNINGS (Long)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>St. Louis</td>
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<tr>
<td>Detroit</td>
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<tr>
<td>Cleveland, dealers</td>
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<tr>
<td>Western Pa.</td>
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<tr>
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<td>Seattle</td>
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### PIPE AND PLUES

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<tr>
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### RAILROAD GRADE BARS

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<td>Eastern Pa.</td>
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### RAILROAD WROUGHT

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### SHOVEL TURNINGS

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### RAILROAD TURNINGS

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<tbody>
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<tr>
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### CAST IRON DORINGS

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### RAILROAD SPECIALTIES

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<tr>
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<tr>
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<td>Chicago, col</td>
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### SHAPING

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<td>New York</td>
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<tr>
<td>Eastern Pa.</td>
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<tr>
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### STEEL SCRAP PRICES

- **Lake Superior Iron Ore**
  - Gross ton, 51 1/2% 
  - Lower Lake Ports
  - Old range bessemer | $4.75
  - Middling bessemer | $4.45
  - High phosphorus | $5.50
  - Middling bessemer | $4.45
  - Old range bessemer | $4.60

- **Spanish, No. African iron**
  - Basic, 50 to 60% | $50.00 nominal
  - Cone wolframite, net ton, duty pd. | $235.00-240.00
  - Brazil iron ore, 68-69% ord. | $7.75 max.
  - Lena bloom, (62) max. | $8.00
  - P. O. B. Rio Janeiro, Schiffelli, 60-64% | $12.50
  - Chrome ore, Indian | 48% gross ton, cif $28.00-30.00
  - Manganese ore
    - Including war risk but not inclusive of carriage charges
      - Caucasian, 50-52% | $80.00
      - So. African, 50-52% | $80.00
      - Indian, 48-50% | $58.00
      - Brazilian, 46% | $50.00
      - Cuban, 50-51% | Free
    - Malaya iron, Maldive iron
      - Sulphide conc. lb., 50% | $0.78

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**STEEL**
Sheets, Strip

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 rerolling 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-
many sources, including some rail-
road orders for car building and
repairs.

**Boston**—Order and specifications
continue at a good rate, buy-
ing in less-than-car loads being ac-
companied by pressure for deliver-
ces. This, although tonnages being ex-
tended on wider plates, heads,
flanged material and in some in-
stances quality and alloy plates.
Low bid of 2.10c, delivered Boston
and Portsmouth, N. H., was sub-
mitted by Otis Steel Co., Cleveland,
on long contract. Deliveries to those
yards included in the navy depart-
ment opening, covering close to 85,000
tons of plates, shapes, bars, sheets
and strip. The same price was sub-
mited for sheets and strip.

**New York**—The plate market is
increasingly active, with building re-
quirements in both the的经历 and
heavier demands from railroads and
railway equipment builders. Poten-
tial demand for armament work is
broadening rapidly.

**Philadelphia**—Plate specifications
continue active and fairly early de-
liveries 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 consider-
ably more extended as a rule.

**Birmingham, Ala.**—Plate pro-
duction probably is at all-time high.
New business is coming in great
volume, and output is at ca-
pacity. Backlogs are accumulat-
ing.

**Toronto, Ont.**—Additional plate
demand is appearing and orders for
some 10,000 tons are said to be pend-
ing. This, however, will have no effect on Canadian produc-
tion 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 1,000 tons for other require-
ments.

**Plate Contracts Placed**

| 18,000 tons, 20 destroyers, to Seattle-
Tacoma Shipbuilding Corp., Tacoma, Wash. | 16,200 tons, 13 destroyers, Union plant, San Francisco to Bethlehem Shipbuil-
 ding Corp., San Francisco. |
| 14,400 tons, four cruisers, Union plant, San Francisco to Bethlehem Ship-
 building Corp., San Francisco. | 9,000 tons, six destroyers, to Bethlehem Shipbuilding Corp., San Pedro, Calif. |
| 1,120 tons, 11 lighters, schedule 2764, navy department, to William Pipe &
 Steel Co., San Francisco. | 1,280 tons, fabricated high-strength low-
 alloy steel plates and one lot eyebolts,
bolts and screw caps, Panama, schedule
 4023, to U. S. Steel Export Co., New York $146,420, bids Sept. 29, Wash-
ington. |
| 900 tons, industrial, 48-inch water sup-
ply pipe for Bellingham, Wash., to Steel Tank & Pipe Co., Portland, Ore. |
| 360 tons, 96,000-barrel tank, Richfield

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**Steel**

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**Bar Prices, Page 70**

**Pittsburgh**—Merchant bar tonnage
placed over the past week was at
about the same volume as the pre-
ceding week and September winds
will be about the same level as Au-
gust. 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
backlogs are extended further, as
reflected in an extension of de-
liveries. Shipments vary widely,
with longest delays prevailing on
larger sizes which are rolled infre-
quently. On more popular sizes,
as well as on small shapes, deliveries
range from three to five weeks.
Pro-
ducers are heavily booked on elec-
tric furnace grades, unfilled orders
in some instances assuring heavy
production into next year.

**Chicago**—Buying of steel bars
and small structural is somewhat
lighter. Automotive buyers have
been slow in placing forward speci-
fications but this is considered rath-
er seasonal. Forging companies
are said to have six weeks’ work
ahead, and heavy machinery build-
ers continue busy.

**Boston**—While heavier consum-
ers of bars, notably alloys, have
extended coverage, buying is main-
tained by increased demand for de-
fense program fabricated products.

**New York**—Hot carbon and cold-
drawn bar deliveries average around
five weeks although recently ship-
ment within two to three weeks was
quoted on 1900 tons of cold
drawn bars for an eastern arsenal.

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**Plates**

**Plate Prices, Page 78**

**Pittsburgh**—New business over
the past week in heavy plates was
somewhat lighter, although consid-
erable 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 short-
ly and some prospective builders of
manned equipment are figuring
plate needs for early specifying.
Backlogs are still high and delivery
rates far in the future.

**Cleveland**—Plate backlogs are sus-
tained, 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
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.

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 $35,430, bids Sept.

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Crane Co., Washington. $10,689,810, bids Sept. 7; 200 tons, east 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. navy, Philadel- phia; to Lancaster Iron Works, Lan- cester, Pa.; bids Sept. 24, inv. 71.

Cast Pipe Pending


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 7,885 freight cars placed by domestic lines over the past few days, total buying so far this month involves 97,335 units, which exceeds that for any full month so far this year, surpassing the August total of 75,255.

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 33,297 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 commision 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.


Norfolk & Western, 1000 fifty-five-ton gondola cars, 500 to Virginia Bridge Co., Roanoke, Va., and 500 to Ralston Steel Car Co., Columbus, O.

Terre Haute & Eastern, 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- and 50 steel gage box cars, to own shops at Reading, Pa.; also conversion of 15 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.


Car Orders Pending

Baltimore & Ohio, 750 fifty-five-foot 6-inch gondolas and 250 sixty-five-foot gondolas; bids asked.


Pere Marquette, 200 seventy-ton mill-gondolas; bids asked.

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 Beth- lehem 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.

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 kgs 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, for less than 100 tons each, 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 book- ings have been fairly light.

American Institute of Steel Construction reports August bookings of structural steel at 109,918 tons, compared with 189,570 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, 100,849 tons in August last year and 900,624 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.
9000 tons, four cruisers for navy to Bethlehem Shipbuilding Corp., San Francisco.
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.
2800 tons, floating steel dry dock, 482 x 71 feet, for navy yard, Mare Island, Calif., to Pacific Bridge Co., Portland, Oreg.; $1,649,000; spec. 9950, bids Sept. 18, bureau of yards and docks, Washington.
2800 tons, windowless airplane factory, 400,000 square feet floor space, Grumman Aircraft Engineering Corp., Beth-

Shape Awards Compared

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<tr>
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<tr>
<td>Weekly average, year, 1940</td>
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<td>Weekly average, 1939</td>
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<tr>
<td>Weekly average, August</td>
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<tr>
<td>Total to date, 1939</td>
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<td>Total to date, 1940</td>
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Includes awards of 100 tons or more.

—The Market Week—

WHERE ZINC MUST STAY ON ... AND DOES

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.
—The Market Week—

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.
615 tons, bridge No. 360.86, Nickel Plate system, Cowden, Ill., to American Bridge Co., Pittsburgh.
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., 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 Pittsburgh-Des Moines Steel Co., Pittsburgh; W. E. Wood Co., Detroit, contractor.
315 tons, theater, Central avenue, Osage sale, N. J., to Belz-Bey-Meyer Co., West New York, N. J.
315 tons, state highway bridge, project RC-40-73, Western Village, Chautauqua county, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; John R. Schultz Contracting Co., Inc., Buffalo, contractor, $134,115.52; bids Sept. 4, Albany.
300 tons, plant addition, American Vis- cose Co., Nitro, W. Va., to Lehigh Structural Steel Co., Allentown, Pa.
270 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-Sinclaire, 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, platform for Louisville Gas & Electric Co., Louisville, Ky., to Louisville Bridge & Iron Co., Louisville.
200 tons, addition to unit 4, Buzzard Point plant, for Potomac Electric Co., Washington, to Fort Pitt Bridge Works, Pittsburgh.
165 tons, including piling, bridge, Canaan-Enfield, N. H., to American Bridge Co., Beth-
160 tons, bridge B-67-16-2, Marion, Mich., to Elkhart Bridge & Iron Co., Elkhart, Ind.
150 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., contractor.
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.

INLAND STEEL CO.
38 S. Dearborn Street, Chicago
Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City, Cincinnati

SHEETS • STRIP • TIN PLATE • BARS
PLATES • FLOOR PLATES • STRUCTURAL PLATES • PILING • RAILS • TRACK ACCESSORIES
REINFORCING BARS

INLAND 4-WAY FLOOR PLATE

INLAND FLOOR PLATE gives a weel, strong, and 4-Way
directions to us is easily
drains readi .. slnicturally
cleaned, Als°, rhvr and fireproof.
strong*, l°nS v'^iand 4-Way Floor
Plate Catalog. hazard tax.

INLAND FLOOR PLATE

INLAND 4-WAY FLOOR PLATE

INLAND FLOOR PLATE
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.
15 tons, column cores, Vernon boulevard, Queens, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., through preliminary 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, shop addition, Manning, Maxwell & Moore Inc., Bridgeport, Conn., to New England Iron Works, Boston: Fletcher-Thompson, Inc., Bridgeport, engineers.

Shape Contracts Pending
15,000 tons, viaduct, grade crossing project, 8, Long Island railroad, Rockaway Beach, N. Y.; Charles A. Vacciris Co., New York, low, bids Sept. 29.
4000 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.
462 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, Edison, Md., for government,
1050 tons, hangar, Coco Solo, Canal Zone; bids in to Hegen-Harris Co., New York, contractor.
1000 tons, state bridge over Mokelumne river, Sacramento, Calif.
955 tons, Los Angeles junction railroad bridge, Vernon, Calif.; bid Oct. 15.
900 tons, building, for Owens-Illinois Glass Co., Bridgeport, N. J.
800 tons, postoffice, Charleston, W. Va.; bids Oct. 16.
750 tons, administration building and bachelor quarters, Quonset Point, R. I.

717 tons, steel sheet pilings, navy yard, Washington; two bidders quoted 2.75c, delivered, schedule 3268.
700 tons, transfer bridges, for Pennsylvania railroad, Greenville, N. J.
590 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.

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.

Cleveland Tramrail Division
The Cleveland Crane & Engineering Co.
1175 Depot Street
Wickliffe, Ohio

Other products: Cleveland Cranes and Steelweld Machinery

September 30, 1940
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 rooms, 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 pocketbook. 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 rooms, 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.

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 Hooskum and others. Etaoin, our sleuthing cameraman, snapped the highlight of the trip however when to her complete surprise Mrs. Charles M. Reesey (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.

SHRODE.
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. Highway buid­ing 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 1460 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, Bone­ville power house foundations, to Bethlehem Steel Co., Seattle.
800 tons, purchasing agent, Los Angeles county, California, to Cenco Steel Products Corp., Los Angeles.
600 tons, United States army buildings, Lower field, Ohio, to Colorado Fuel & Iron Corp.; F. J. Kirschfob, contrac­tor.
500 tons, additional work, pier exten­sions, navy yard, Portsmouth, N. H., to Baneroff & Martin Rolling Mills Co., Portland, Me.; Aberthaw Co., Boston, contractor.
350 tons, subway, route 10, section 10, Brooklyn, to Bethlehem Steel Co., through George H. Flnn, New York.
300 tons, Cedarmount 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. Rice Construction Co., Dallas, Tex.
243 tons, filtration plant, Gadsden, Ala., to Truscon Steel Co., Youngstown, O., through V. B. Higgins & Co., Greenwich, N. Y.
200 tons, Albertus Brown Homes hous­ing, Toledo, O., to Pollak Steel Co., Chicago; Weinstein Construction Co., contractor.
175 tons, paving, Ida county, Iowa, to Sheffield Steel Corp., Kansas City, Mo.
160 tons, Mesta Machine Co., forge plant, Wood Co., Detroit, contractor.
100 tons, student union, state college, Fresno, Calif.; to Kyle & Co., Fresno, Calif.
100 tons, Cessna Aircraft Co., Wichita, Kan., to Sheffield Steel Corp., Kansas City, Mo.
100 tons, state highway project RC-40­73, 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. Vaebris Co., New

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
250 PARK AVENUE • NEW YORK
Eldorado S-2202
750 tons, including 240 tons wire mesh, additions, naval ammunition depot, Hawthorne, Nev.; bids opened.
750 tons, bars and rods, material division, air corps, Wright Field, Dayton, O.; bids Oct. 7, $1,616.
500 tons or more, naval reserve armory, Seattle; funds allocated; bids soon.
430 tons, highway project, route 6, sections 8A and 8B, Clifton, Passaic county, N.J.; bids Dec. 21, $1,176.
350 tons, housing project, Pawtucket, R.I.; taking bids.
360 tons, for bridges over Mississippi river at Chester, Ill.; Massman Construction Co., Kansas City, Mo., general contractor.
260 tons, highway project, route 29, 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 2B, Union county, N.J.; bids Oct. 15.
200 tons, Sherwin-Williams Co., paint factory, Chicago.
200 tons, housing project, Newark, N.J.; Patzer Construction Co., Newark, N.J., low.
185 tons, Cook county, Illinois, highway lettings; bids Sept. 30.
160 tons, housing, Rock Island, III.
162 tons, bridge, FAP-A-491-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, F.B.I. of 79-13-5-C1, Caro, Mich.
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 292-111; bids Oct. 4.

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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 bookings 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.

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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' business has about finished up for the year.

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Warehouse

Warehouse Prices, Page 72

Pittsburgh—Local warehouse sellers report activity high, with construction items leading. Structural, plates, nails and other wire products are particularly active.
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 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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Steel in Europe

Foreign Steel Prices, Page 72

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 Chinese ore was 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 13 1/4 per cent of manganese and 3 1/2 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 1/8-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 13 1/4 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; elongation in two inches, 72 1/4 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, crane hook blocks, and others.

Hot-rolled manganal is carried in the Ryerson warehouses in 48 x 120-inch plates in thicknesses of 3/16, 1/4, 1/2, 3/8, 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 soon come.

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
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. New 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 alloy product, brass and bronze ingot, and scrap prices rose in line with the product, brass and bronze ingot, and scrap. Copper, hot rolled, to 12.00c, delivered Connecticut valley. All rolled and drawn allied products, including brass and bronze ingot, continued to advance money for this important “peace-time” industrial activity.

Zinc—Prices jumped 40 points on order with refiners 325,000 tons of zinc, 36 per cent above the previous record. Fabricators now have on order with refiners 325,000 tons of zinc, possibly an all-time record. Fabricators now have on order with refiners 325,000 tons of zinc, possibly an all-time record. Fabricators now have on order with refiners 325,000 tons of zinc, possibly an all-time record. Fabricators now have on order with refiners 325,000 tons of zinc, possibly an all-time record. Fabricators now have on order with refiners 325,000 tons of zinc, possibly an all-time record.

—The Market Week—

Nonferrous Metal Prices

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<td>Rods</td>
<td>Wires</td>
<td>Yello brass (high)</td>
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<tr>
<td>Yellow brass (high)</td>
<td>21.85</td>
<td>21.12</td>
<td>14.98</td>
<td>19.48</td>
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</tr>
<tr>
<td>Copper, hot rolled</td>
<td>21.12</td>
<td>14.78</td>
<td>17.12</td>
<td>17.87</td>
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<tr>
<td>Lead, cut to jobbers</td>
<td>7.25</td>
<td>5.00</td>
<td>4.85</td>
<td>7.25</td>
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<tr>
<td>Zinc, 100 lb. base</td>
<td>12.50</td>
<td>5.00</td>
<td>4.85</td>
<td>7.25</td>
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<td>F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Com. copper</td>
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Construction and Enterprise

Ohio

ALLIANCE, O.—Babcock & Wilcox Co., 85 East Liberty street, New York, has bought former A. O. 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 Kitts Boiler & Tank Co. plant at Camden avenue and Bank place. Removal is forced by flood control project...
at Massillon. Company manufactures pumps for ships, flood control and water supply and has contract for fuel pumps for several railroads.

CLEVELAND—Fulton Foundry Co., 7350 Morgan avenue, is having plans drawn by Walther J. Wetel, engineer. Company is making two and two-story addition 30 x 200 feet for enlarged foundry and pattern storage space.

CLEVELAND—Cuyahoga Foundry Co., 415 North Prospect street, has plans by Theodore A. Badowski, 7100 Broadway avenue, for a foundry addition 80 x 150 feet. Company is present.

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 H. Haley 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, Ore. to Cleveland. Portland plant will be devoted to production of airplane parts and will help in theaken for parts for army flying fortresses.

CLEVELAND—Multi-Alloy Die Casting Machines Inc. is being formed to manufacture and sell die casting machines. John R. Love, president, George S. Davis, secretary-treasurer, both officers of Cuyahoga Tool & Mold Co., and J. I. Charles, is president of the company. Facilities will be used at present, with separate plant planned for early occupancy.

CLEVELAND—Artistic Iron Products Co., 5710 Bessemer avenue, is being incorphpated, to provide funds for expansion to handle increased volume of manufacturing and additions to its present 10,000 square feet floor space will be built.

CLEVELAND—Park Iron Works, Inc., 6390 Park avenue, industrial building and building addition, is increasing capital and adding principals. Griffith H. Powell and Edward Gallagher will be officers in the new organization.

CLEVELAND—Dempsey Plastics, Inc., and J. A. Dempsey and Lewis Hanford, 1502 Castle avenue, principals, is negotiating for two-story building in Lorain avenue and Twenty-third street district and has ordered special presses and other equipment. Alterations and rearrangement will be made.

CLEVELAND—Ohio Forge & Machine Co., 3010 Woodhill avenue, is enlarging its tool-hardening plant at cost of $6,000. Plant is located at 2851 East Ninety-third street. H. L. Vokes, 3200 Chester avenue, is general contractor.

CINCINNATI, O.—Cincinnati Bleckford Tool Co., 3231 South street, Oakley, O. Nelson, president, will build an addition to its plant, 134 x 253 feet, to cost about $140,000.

CINCINNATI—Cincinnati Gear Co., Frank Schuman, secretary-treasurer, will build addition adjoining present plant, 3400 square feet floor space, for storage of raw material for one and two-story building.

ELYRIA, O.—Westinghouse Automotive Air Brake Co, now located at Pittsburgh, will move general office and factory to Elyria as soon as office and facilities are completed. New location is 80 x 211 feet, costing about $30,000. 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, building storage tanks.

DU BOIS, PA.—Vulcan Soot Blower Corp., W. N. McCreight in charge, 326 West Long avenue, has plans by R. G. Harbert, 340 West Long avenue, for a foundry building, for one and two-story building and concrete plant, 100 x 125 feet, to cost over $40,000.

EHERNFIELD, 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 Fairmount Machinery Co., Fairmount, V. A. Cost estimated at $75,000.

ERIE, PA.—Allied Oil Co., Inc., standard building, Cleveland, plans construction of a bulk fuel oil plant, including 3,500,000 gallons of steel storage tanks, pipe line facilities, docks and other structures.

LEWIS RUN, PA.—Williams Oil Co., 132, Bradford, Pa., is developing Muscle mountain oil field, including wells, pipe lines, steel tanks and a 4000-foot office and laboratory building, at cost of about $25,000. J. Fensel, Hooker-Rutherford building, Bradford, is engineer.

MCALLEN, PA.—Allegheny Chemical Corp., near Womeldoros, Pa., Velmaunkeliale, 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 3300 South Ashland avenue, at cost of 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 building, 75 x 203 feet at its Northwest station, Roscoe street and California avenue.

MCook, ILL.—Electro-Motive Corp., subsidiary of General Motors Corp., Detroit, has let general contract to Hagar Benson, LaGrange, Ill., for a one-story manufacturing addition, 250 x 300 feet, to cost about $300,000.

MOLINE, ILL.—Peoples Light & Power Co., 7310 Bessemer avenue, has plans by Theodore A. Badowski, 7100 Broadway avenue, for a one-story rolling mill addition 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.—J. J. Richardson, chairman, airport commission, city hall, will build an airport, including runways and buildings, at cost of about $500,000. E. M. Corbett, 49 Purchase street, is architect.

WORCESTER, MASS.—Johnson Steel & Wire Co., 220 North bridge street, will let contract soon for brick and steel text plants to cost over $40,000. Albert Kahn, 352 West Adams street, will do the work.


WORCESTER, MASS.—W. A. Bennett, mayor, city hall, will ask bids soon for construction of airport, including hangars, shops and administration building and other accessories.

New York

HUDSON, N. Y.—Universal Atlas Cement Co., 1200 department-second street, New York, will build a cement plant addition to cost about $120,000. General contract has been given Huii Ei-<

denceering Co., Clark building, Pittsburgh, S. J. Robinson, care owner, is engineer, JAMESTOWN, N. Y.—Smokestack Corp., 402 Chandler avenue, plans for ball bearings, has plans by Beck & Tinkham, Bailey building, for a brick and steel text addition to cost more than $750,000.

NIAGARA FALLS, N. Y.—Carborun-
WHEN HEAT'S a factor

When hemp core wire rope is subjected to excessive heat, as in ladle cranes, the core becomes charred, crumbles, and ceases to support the surrounding outside wire strands. Macwhyte men, spending a lifetime in the manufacture of wire rope, make an independent wire rope center for Macwhyte Ladle Crane ropes that gives proper support and safety under excessive heat conditions. Leading steel mills are well pleased with this wire rope. It is worth a trial in your ladle cranes.

Just specify Macwhyte Whyte Strand I.W.R.C. Ladle Crane Rope and state the size needed.

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New York — Pittsburgh — Chicago — Ft. Worth
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Distributors throughout U. S. A.
Manufacturers of wire rope (PREformed and regular) to meet every need, and left & right lay braided wire rope slings.

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Ladle Crane Wire Rope

CUT GEARS
All Types and Sizes
Baldwin Roller Chain and Sprockets
Heat Treated Alloy Steel Gears to Customer's Specifications
Special Gears and Special Gear Units
PITTSBURGH GEAR & MACHINE CO.

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Sales Offices and Complete Stocks in all Principal Cities

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BROOKE PIG IRON
E. & G. BROOKE IRON CO.
BIRDSBORO, PENNA.

Have It Galvanized by—
Joseph P. Cattie & Bros., Inc.
Philadelphia's Oldest, The Country's
Largest Hot Dip Job Galvanizer
Galvanized Products Furnished

TOLEDO STAMPINGS
Our Engineering Department has had long experience in working out difficult stamping problems. We want to work with you on your development work as we have had great success in changing over expensive parts and units into steel stampings. Our production facilities can amply take care of almost all stamping requirements.

Write for Catalogue

SMALL ELECTRIC STEEL CASTINGS
(Capacity 500 Tons Per Month)
WEST STEEL CASTING CO.
CLEVELAND, OHIO, U.S.A.

BROOKE 
HIP IRON
E. & G. BROOKE IRON CO.
BIRDSBORO, PENNA.

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BROOKE PIG IRON
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HOT-DIP GALVANIZING PRACTICE
By W. H. SPOWERS JR.

GIVES full and carefully reasoned explanations of the why and wherefore of galvanizing. All the latest methods and processes are described and very copiously illustrated by a large number of diagrams and photographs.

Highly recommended to the man on the kettle, the designer of galvanizing plants, the metallurgist, as well as to those who zinc coat steel commodities and containers, etc.

THE PENTON PUBLISHING COMPANY, Book Department, Penton Building, Cleveland, O.
vice president and general manager, 30 Clinton street, New York, will build an addition to double capacity of Cabin Creek power plant, at cost of about $50,000.

NITRO, W. VA.—American Viscose Co., 105 South Twelfth street, Phila- delphia, will let contract soon for its $20,000,000 power plant, 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 & Mul- ligan 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, Fox, Schmidt, Culpeper, is president.

Machine Co. Inc., has been incorporated at $135,628 for construction of 202 miles of 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 pumping water for the navy contract. Contract for about $20,000,000 worth of having been taken. Machinery and equipment, worth $2,000,000. Peak & Shiftlet, 914 Marquette avenue, are architects. Company recently also started construction of addition to plant in Minneapolis.

MINNEAPOLIS.—Minneapolis-Honey- well 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, sheaves and similar equipment, will expand and improve its structural shop. G. H. Johnston, Empire building, is architect.

WADENA, MINN. Todd-Wadena Power & Light Co-operative association, Earl Schultz, president, has been allotted $257,000 REA funds for construction of 282 miles rural electric lines in Todd and Wadena counties.

Texas

HOUSTON, TEX.—Humble Oil & Le- nining Co., Humble building, has sub­ mitted plans to the government for a nitro­ adverse 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, C. T. Cosgrove, chairman, is having plans drawn for a plant addition costing about $75,000.

PORTVILLE, IOWA.—State board of control, D. R. McCrery, chairman, is having plans drawn for a one-story addition 60 x 260 feet, costing $50,000. J. A. Leclair & Dupuis Ltd., 620 Cathcart street, Montreal, Que., for the state for additional water rights.

Canada

HAMILTON, Ont.—Otis Penaon Eleva- tor Co., Ltd., Victoria avenue North, is having plans prepared by1. H. Connor & Souter, 36 James street North, for an addition costing about $75,000.

KINGSTON, Ont.—Canadian Locomo­ tive Works Ltd., Ontario street, has let general contract to E. G. M. Cape & Co., 220 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. Robert- son Ltd., 57 Floor street West, Toronto, for a plant addition 160 x 800 feet, John 6. Myle, 230 Floor street West, is architect.

YORK TOWNSHIP, Ont.—John T. Heburn Ltd., 18 Van Horn street, Toronto, Ont., is having plans prepared for a $100,000 factory on the site of 351 Weston road. C. Nicklin is engineer.

MONTREAL, Que.—Canadian Tube & Steel Products Ltd., 5787 Hamilton street, has let general contract for a one-stor­ 65,000, J. A. Leclair & Dupuis Ltd., 220 Cathcart street, has general contract.
TRAVELING CRANES
OVERHEAD ELECTRIC
Various sizes.
Send us your inquiries.
INDUSTRIAL EQUIPMENT CORP.
PITTSBURGH, PA.

Rails—"1 Ton or 1000" 
NEW RAILS—5000 tons—All Sections—All Sizes.
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All sizes, practically as good as New.
ACCESSORIES—All kinds of Accessories carried
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Buy from One Source—Save Time and Money.

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

WANTED
Used Draw Bench, 50,000-70,000 lbs.
pull, 40’ bed to finish 25’ tubing.
Automatic return—motor drive preferred, but not necessary. Advise location for inspection. Address Box 320, STEEL, Penton Building, Cleveland.

FOR SALE
ONE CINCINNATI DUPLEX MILLING machine, Table 11” x 57”, Table Travels 36”, No. 4 Brown & Sharpe Taper Spindle adjustment of each head 14” vertical, 12½” horizontal.

ONE NO. 10 BROWN & SHARPE Cylinder Grinder, 20” between the centers, 7½” maximum swing, or 8” swing with a 12” wheel. Carriage can be moved to grind up to 3½” to the foot taper. Completely motorized with 3 phase, 5 H.P., 60 cycles, 220 volt motor.

THE COMMERCIAL
SHEARING & STAMPING CO.
Youngstown, Ohio

48” and 62” Vertical Boring Mills.
48” x 20” New Haven Lathe, 22’” sw. B.D.
38” x 8’” Farrel Holm Grinder, M.D.
19” Bridgeport Knife Grinder, M.D.
16” 1st United B.—1st Pierco Press.
5”-4”-5”-8”-12” Wm. Pipe Shear, M.D.
No. 5 Hill Giant Shear 4-1/2” sw. M.D.
16”-14”-14”-4-1/2”-36” Vadar Gang Shears, M.D.
48” Artist-fed. Straightener 17-3-1/4” M.D.

WEST PENN MACHINERY CO.

FOR SALE
Miscellaneous surplus material, perfect condition, for sale. Steel sheets, angles, bars, machine and stove bolts. Scrap prices not considered. Write for list. Address Box 318, STEEL, Penton Bldg., Cleveland.

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When you have machinery or equipment you want to sell—STEEL can help you. For rates, write STEEL, Penton Bldg., Cleveland.

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FOURTEEN YEARS EXECUTIVE, SALES, estimating and engineering experience. Field and office, in material handling including monorail, chain and belt conveyors. Several years experience in instrumentation, resigning because of policy differences, desires responsible position with fabricator or concern operating such a collateral department—conveyor or furnace manufacturer, for example. Address Box 303, STEEL, Penton Bldg., Cleveland.

SALES ORGANIZATION DESIRES MANUFACTURING REPRESENTATION IN PITTSBURGH, CLEVELAND, DETROIT. Have established acquaintanceship in steel and industrial plants. Address Box 309, STEEL, Penton Building, Cleveland.

ACCOUNTS WANTED. Graduate metallurgist, established clientele and sales office in Detroit, wants one more line. Fifteen years sales experience. Address Box 313, STEEL, Penton Bldg., Cleveland.

OPPORTUNITIES AND PROFITS are of equal interest to distributors and manufacturers—use an ad on this page four weeks to let manufacturers know you are interested in taking on new lines.

Bids Wanted

Federal Works Agency, Public Buildings Administration, Washington, D.C., Sept. 16, 1940.—Sealed proposals in duplicate will be publicly opened in the Office of the Commissioner of Public Works, W. E. Reynolds, Commissioner, to builders', exchanges, chambers of commerce or other exchanges, desirable manufacturing centers wanted by national manufacturer specialized industry. Desires responsible position with reasonable requirement. Address Box 319, STEEL, Penton Bldg., Cleveland.

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This thoroughly organized advertising service of 30 years recognized standing and reputation is furnished to manufacturers without solicitation for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision in our agreement. Identity is covered and, if employed, present position protected. In a year's battery about $2,500 or more, send only name and address for catalog, R. R. Busby, Inc., 110 Delard Bldg., Buffalo, N. Y.

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SALES REPRESENTATION IN LARGE manufacturing centers wanted by nationally known manufacturer specialized industry. Quality lubricants, including kinds unobtainable elsewhere, for steel, brass, forging, cement, railroads, ships, airplanes, docks and locks. Liberal commissions and earnest desire to function to the best advantage? Tell them what you have to offer. Steel. Employment Service

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FOR SALE

Drop Forge Plant and business now in active operation. Completely equipped with die and blacksmith department. Located in Mid-Western city. Excellent shipping facilities and favorable labor conditions. Address Box 319, STEEL, Penton Building, Cleveland.

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MANUFACTURER'S AGENTS—MANUFACTURER OF Foundry Supplies and Equipment desires to negotiate with salesmen, with established contacts, in Indianapolis, Cincinnati, Cleveland and Milwaukee, for addition to present representation. Address Box 297, STEEL, Penton Bldg., Cleveland.

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to see that the personnel of your company is tip-top in efficiency and that all departments are sufficiently staffed to function to the best advantage? Tell them what you have to offer through an advertisement in the Help Wanted columns of STEEL.

September 30, 1940

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ADVERTISING INDEX
Where-to-Buy Products Index carried in first issue of month.
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.