



As the Editor Views the News

WITH the eyes of the world focused upon the Far East, speculation is rife as to what a prolonged conflict would mean to American industry. Stoppage of tungsten from China over an extended period would affect steelmaking in this country. In 1936 (p. 17) 74 per cent of the tungsten imported into the United States came from China and for the first six months of 1937 China furnished 69 per cent of our imports. Of the tungsten consumed in this country, about 90 per cent is used by the steel industry. At present the market is in confusion and prices are nominal.

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In the first half of 1937, Japan imported 345,685 tons of American finished and semifinished steel as compared with 28,832 tons in the first half of 1936.

China, Japan Imports Higher

Comparative figures on Chinese imports for the same periods were 69,876 and 26,151 tons, respectively. Japanese purchases of American iron and steel scrap for the same periods were 1,318,803 and 503,165 tons, respectively, and China's were 27,838 and 15,433 tons. Thus in the first half of 1937 the combatants took over 30 per cent of the finished and semifinished iron and steel and 62 per cent of the scrap exported from the United States.

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Consumers, fabricators, distributors and producers of steel will be quick to grasp the significance of a new system of merchandising steel, announced this week (p. 15), which provides the purchaser with certified information regarding the analysis and properties of the steel he buys. The mechanics of the system involves segregating whole heats of steel which come within narrow limits of analysis, testing the metal for chemical and heat treatment characteristics and then furnishing this pertinent information to the buyer. It is a novel plan and one that will be watched closely by buyers and sell

New in Steel Merchandising

ers. . . . Peace and prosperity rule the Lake Superior iron ore ranges. More mines are in operation (p. 19) than in more than a decade. The season's ore movement will be limited only by the handling capacity of the lake fleet. It is a gratifying situation for an industry hard hit by the depression.

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Whenever increased volume begins to crowd the facilities of a manufacturing plant, the normal conclusion is that additional equipment and floor space are required. In many cases this is the only alternative. Occasionally, however, a study of layout will reveal opportunities for increasing operations without adding space.

Uses Head To Save Dollars

In a plant manufacturing plain bearings, a new manager (p. 49) insisted upon analyzing the apparent need of additional facilities before authorizing the construction of a plant extension. As a result, a revision in the scheme of materials handling not only permitted an increase of 25 to 30 per cent in output with the same personnel and equipment but also released space for expansion in the future. This is using one's head to save his pocket-book.

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Manufacturing crawling tractors embraces a wide range of operations typical of the metalworking industries. A camera, recording scenes in the various departments of a modern tractor plant (p. 40), shows how the results of forging, welding, heat treating, machining, grinding, and other operations eventually meet on the assembly line. The whole procedure is not unlike the routine of an automobile plant. . . .

Crosses Steel And Gray Iron

A metal combining the high resistance to wear, good frictional properties and free machining qualities of cast iron with the uniformity, ease of hot or cold working, response to heat treatment and good physical properties of steel is useful in many applications, particularly in the die field. Graphitic steel seems to possess these qualities. The authoritative discussion of this steel and its applications (p. 34) throws light on a new and interesting material.

E. L. Shaner





Immediate Steel

There is hardly a product in the steel and allied lines that you cannot secure quickly and economically from the nearest Ryerson plant. Stocks that include more than 10,000 sizes and kinds of steel and allied products . . . modern handling and cutting facilities . . . and special dispatching methods, assure accuracy, dependability and speed. When you need steel, call on Ryerson. Ten plants stand ready to meet your requirements.

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

RYERSON STEEL - SERVICE

Steel Now "Certified"

A New Step in Merchandising Procedure—Analysis and Test Data Supplied to User Before Material Is Shipped

A BRAND new procedure in merchandising steel—a system which provides for complete analysis and tests to be made by the distributor, and certified to the consumer—was introduced last week.

Just as thousands of other products in many industries, notably chemicals and drugs, are certified as to their properties, steel now is to be marketed on a similar basis, giving the fabricator a degree of assurance that he could only obtain by making or having the tests made for him.

Under this plan whole heats of steel which come within narrow limits of analysis are to be selected, and tested for chemical and heat-treatment characteristics. The data will be prepared and delivered to the customer, whether he buys only a few pounds or several tons.

This novel "certified steel plan" was announced by Joseph T. Ryerson & Son Inc., Chicago. The company has been developing it for several years, adjusting stocks and smoothing out operating problems.

It is described as of "particular value to consumers of alloy steels." Most of these steels are subjected to heat treatment by fabricators to develop strength, hardness, resistance to shock, or other special physical characteristics.

The response of alloy steel to heat treatment depends partly on analysis and partly on the general hardening characteristics of the heat, these characteristics being governed by the structure of the material, inherent grain size, etc.

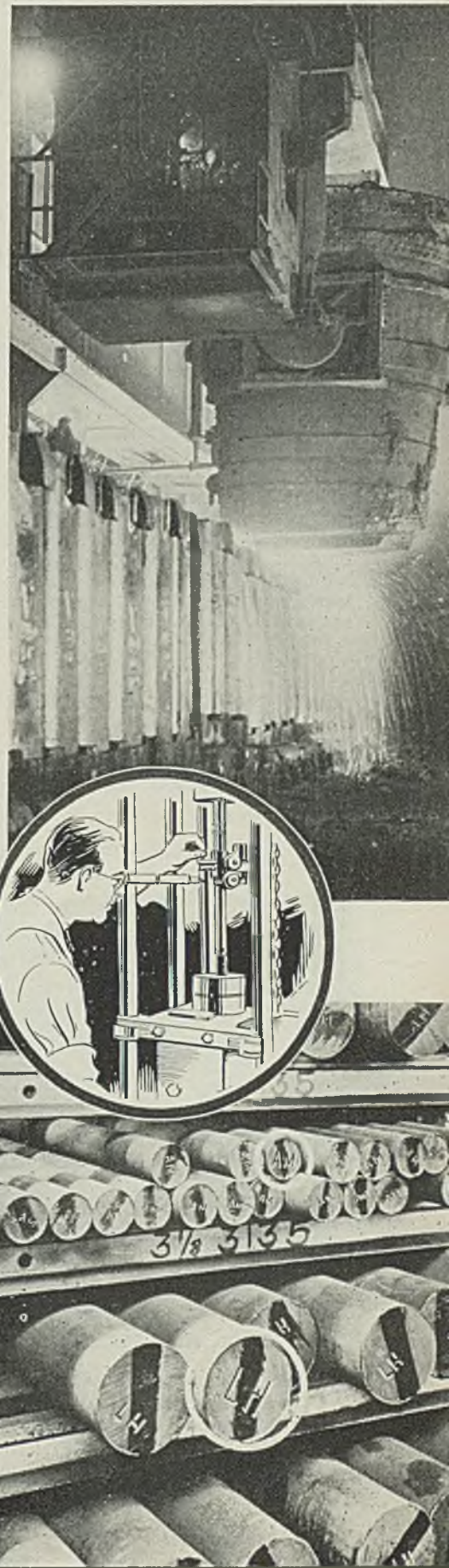
The accuracy with which a melter can work is limited and, therefore,

a producing mill cannot accept specifications for exact analysis, but must be allowed a quantitative range of each element.

The Society of Automotive Engineers has compiled a set of specifications covering the great majority of alloy steels used today. It has worked with steel producers and has narrowed the limits of composition as far as it is practical for the steel-makers to follow. These limits are relatively wide and, therefore, steel specified only to the S. A. E. specifications may vary greatly from one heat to another in its response to heat treatment.

The Ryerson company has been seeking to solve this commonly recognized problem for many years. The company determined to provide alloy steel which, when heat

THE certified steel plan begins at the mill with the selection of entire heats of alloy steels that come within a narrow range of chemical and physical specifications. Bars are identified by heat symbol letters stamped on the ends. The same symbols are repeated on data sheets sent to buyers



treated, would give more uniform response.

When large tonnages are purchased direct from steelworks it is practical for the user to analyze each heat and test it for its response to heat treatment. He is able to control his process so as to offset any differences between heats. When average lots of alloy steel are purchased from stock, however, it is expensive to run analyses and tests on the bars as they are received.

To accomplish the desired result, the Ryerson company had two fundamental problems to overcome.

The first was to obtain standard alloy steels for stock which conformed to an analysis range closer than that specified in the S.A.E. ranges, and which were closely controlled in general hardening characteristics such as inherent grain size, etc.

The second problem, after having obtained such steel, was to develop a method of informing each customer of the complete analysis and heat treatment characteristics of each bar shipped to him.

The first problem was solved by writing specifications for alloy steels on a much closer chemical analysis basis than the standard S. A. E. specifications, and including in these specifications other factors governing the heat treatment responsiveness of each type of steel.

Arrangements were made to watch heats and select only those that came within this restricted range. The heat is then identified by letter symbols and later rolled into bars, bearing the same letters.

Identification letters are stamped on the ends of each bar. Small bundles are tagged.

Heat treating tests are made on standard samples from each heat. All bars produced from a heat carry the identifying letters assigned to that heat, so the only problem that remained was to transfer the accumulated information about the steel to the customer.

It would not seem difficult to give the customer this information, but from a practical standpoint it presented many problems, not the least of which was that the information must be given to the customer before he uses the steel.

Charts Give Data

To condense the information the company devised two types of charts, one for carburizing steels (case hardening) and the other for steels of higher hardening characteristics which are heat treated by quenching.

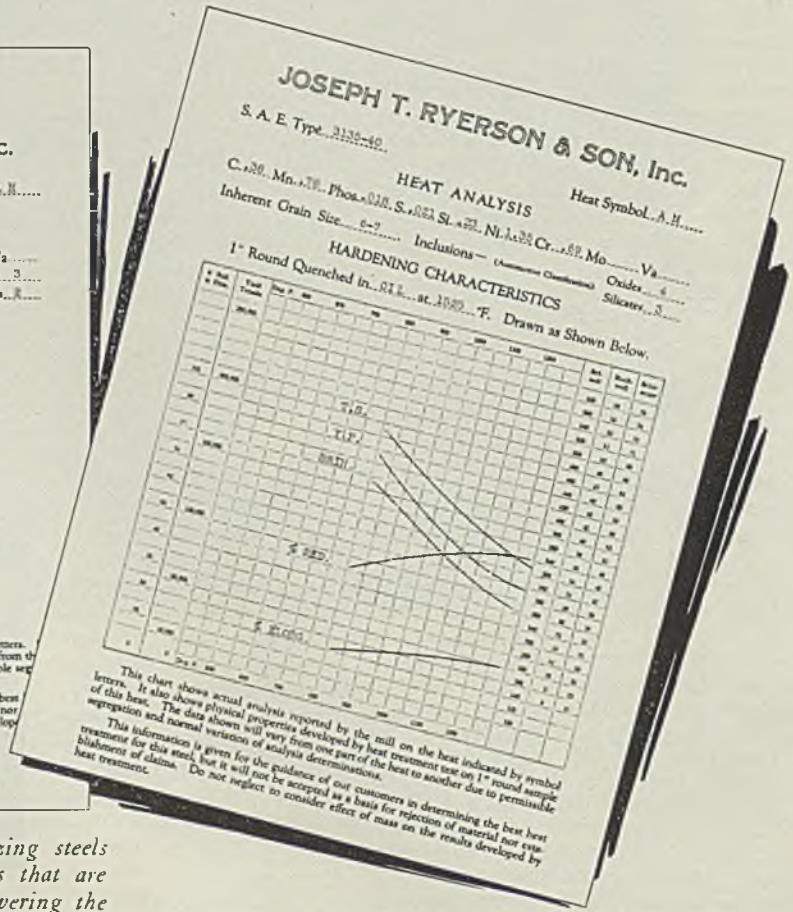
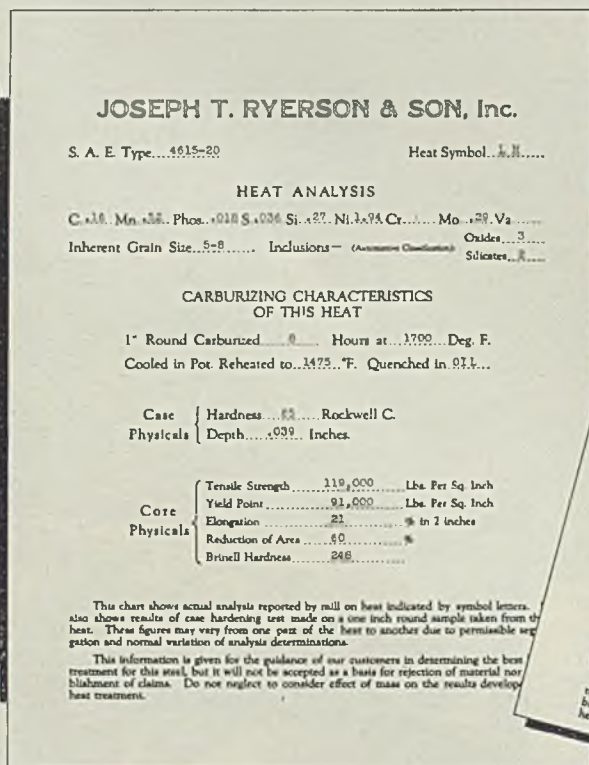
The charts for carburizing steels give the heat analysis identifying letters, McQuaid Ehn grain size, cleanliness rating, and also the re-

sults of a carburizing test of a standard sample. This shows the hardness of the case, the effective depth of the case and the physical characteristics of the core.

For the quenching steel, the analysis, identifying letters, McQuaid Ehn grain size and cleanliness rating are given, with a chart showing curves representing tensile strength, yield point, elongation, reduction of area, brinell hardness, etc., as developed by test specimens quenched at a suitable temperature for the analysis and drawn to various temperatures.

This information is delivered immediately to the customer so that it is received before the steel is subjected to heat treatment. The heat treater then has complete information as well as a record for his file as to the composition of the steel used in every job which has gone through his shop.

The plan could not be offered until the company had accumulated sufficient stocks to be able to give prompt shipment on practically any size and analysis. During the several years of preparation it tried out the method by working closely with selected companies, and checking results. Through the co-operation of these companies the plan has been thoroughly studied and is stated to have resulted in much more economical heat treatment.



Certified alloy steel data sheet for case carburizing steels (left), and data sheet used for the higher alloys that are hardened by quenching. One of these sheets, covering the particular steel shipped, is sent to the customer

Tungsten, Important Element in Tool Steels, Affected by Sino-Jap War

DESPITE the intensity of hostilities in China, actual volume of steel buying for the Far East has shown little change. Tentative negotiations are noted, but they have not developed as yet in large orders, according to exporters.

It is pointed out that Japan has been a heavy buyer in recent months, particularly of scrap, pig iron, semifinished steel and ship steel. Japan has been conducting a shipbuilding campaign of broad scope.

In the first half of 1936, Japan's purchases of semifinished and finished steel in the United States amounted to only 28,832 tons, whereas in the first half this year the total was 345,685 tons. This tonnage was slightly more than 25 per cent of American exports of semifinished and finished iron and steel products. For two consecutive months this year Japan was a heavier buyer of these products than Canada, second best customer.

China has been buying on a much smaller scale, and principally for ordinary peace-time needs. Its imports of semifinished and finished steel from the United States in the first half of 1936 amounted to 26,151 tons, and in the first half this year, 69,876 tons.

Quotations Are Nominal

One of the principal effects of hostilities so far has been to disorganize the market for Chinese tungsten ore, and, in turn, ferrotungsten. Prices have advanced swiftly and sharply.

Firm quotations on tungsten ore are virtually out of the question, trade leaders said last week. Nominal quotations are noted at London of more than 100 shillings per long ton, but it is believed that such offerings are at best based on scattered small lots held in Europe, possibly by traders who already have a substantial profit and have decided to cash in. Incidentally, it is believed that little is afloat.

However, London quotations are indicative of the increasing strength of the market. For instance, on the basis of a quotation of 100 shillings per long ton at London, the market

in New York per short ton, allowing for \$8 duty, would be about \$30 to \$31. But such prices are too speculative to attract interest of the more conservative in the trade, who are inclined to mark time until the situation becomes further clarified and a sounder appraisal can be made. As a matter of fact, buyers of round tonnages declare that in the light of the present situation there is little for them to do but wait.

Price Trend Is Upward

With sellers of ferrotungsten waiting to see what the replacement value of their ore is going to be, the market on this product is largely nominal. Judging from scattered offerings, the trend recently has been strongly upward, but the market is in such a state of flux that quotations are difficult to establish.

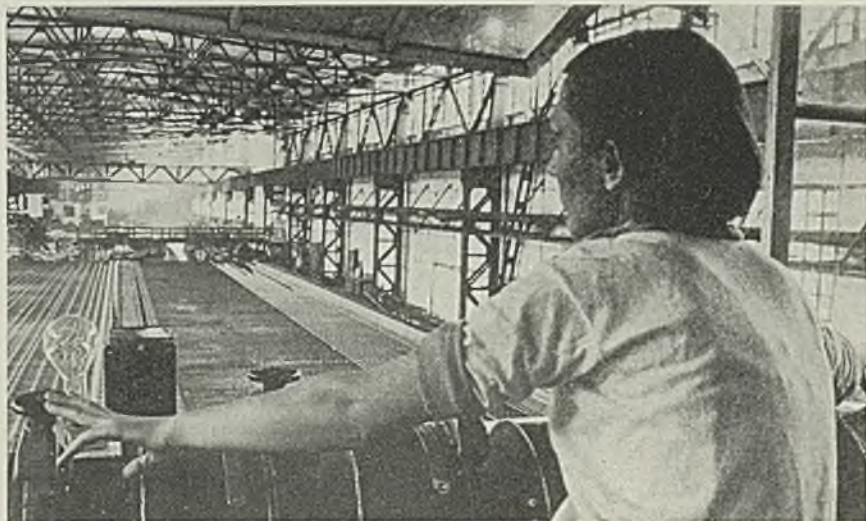
Imports of tungsten ore and concentrates into the United States from China in 1936 totaled 5,133,850 pounds, or 74 per cent of all imports of this material. In the first six

months this year the imports from China amounted to approximately 4,456,680 pounds, 69 per cent of the total. The value of imports from China in 1936 was \$1,139,147, and for the first half this year, approximately \$934,722.

The United States is dependent upon foreign sources for approximately 75 per cent of its requirements. This imported tungsten is obtained largely from China, although the production of Burma, the Malay States and other countries, has been appreciable. However, the bulk of production having come from China, the price has been controlled principally by the amount of Chinese tungsten available.

During the past 20 years tungsten prices have fluctuated over such a wide range that a feeling of instability has existed and industry has been forced to large and expensive stocks of tungsten for protection. The war department considers tungsten as a "strategic material."
(Please turn to Page 88)

Women Operators in Russian Steelworks



MANY women work in Russian steel mills and heavy industries, principally in the lighter manual occupations, as indicated by photographs in official soviet publications. This woman is operating the control in the blooming mill at the Stalin "metallurgical combine" in Magnitogorsk. Sovfoto

New Hamilton Stack Started

IN THE presence of invited guests, Hamilton Coke & Iron Co., wholly owned subsidiary of American Rolling Mill Co., last Thursday blew in its new blast furnace at New Miami, O.

The stack adds 450 tons daily to the Hamilton company's blast furnace capacity, bringing the total to 1150 tons. Its No. 1 furnace, with a capacity of 700 tons, was rebuilt and modernized a year ago. Output of No. 1 furnace will be used in Armco's open hearths at Middletown, O. Production from the new furnace will be marketed as merchant pig iron.

Charles R. Hook, president, American Rolling Mill Co., said the stack was added "so the rapidly growing demands from the parent company and from the outside merchant pig iron market could be satisfied."

Co-operation Justifies Expense

Without confidence in the community, management and employees, appropriation of \$1,000,000 for new equipment would not have been made, Mr. Hook said. The spirit of co-operation apparent everywhere justified the expenditure, he stated.

Mr. Hook appealed to business men to explain to representatives of the state and national governments the importance of preserving our

present system of government, without which such industrial improvements could not be made. As proof of his statement he pointed to conditions abroad.

The Hamilton furnace is the first to be newly erected since 1928, although many stacks have been relined and reconditioned. In 1928, the Tennessee Coal, Iron & Railroad Co. blew in two new furnaces at Fairfield, Ala. At present construction is under way on a new stack for Inland Steel Co. at Indiana Harbor, Ind., and on one for Great Lakes Steel Corp. on Zug island, near Delray, Mich.

Financial

SHEET & TUBE ISSUES EARNINGS STATEMENT

Youngstown Sheet & Tube Co., Youngstown, has made available to its security holders a consolidated earnings statement for the 12 months ending April 30, 1937. Net sales during this period amounted to \$151,009,761 resulting in an operating profit of \$25,480,524, before providing for depletion of minerals and depreciation of plants. Net profit for the 12 months equaled \$14,303,177.

LUDLUM SEEKS TO INCREASE CAPITAL

Ludlum Steel Co., Watervliet, N. Y., plans to raise between \$2,500,000 and \$3,500,000 through issuance of not more than 125,000 shares of

common stock, to be offered to stockholders on a pro rata basis. About \$1,410,000 will be used for improving plant and equipment, including a research laboratory. Plan to double the authorized capital to a total of 1,000,000 shares will also be considered. Stockholders will vote on this Sept. 23.

DIVIDENDS DECLARED

Wheeling Steel Corp., Wheeling, W. Va., has declared an initial quarterly dividend of \$1.25 a share on the \$5 preferred stock and a dividend of \$1.50 a share on the 6 per cent preferred, both payable Oct. 1 to stock of record Sept. 24.

Directors of Republic Steel Corp., Cleveland, declared the quarterly dividend of \$1.50 per share on the 6 per cent cumulative convertible prior preference stock, series A. Dividend of \$1.50 per share was also declared on the 6 per cent cumulative convertible preferred stock. Both are payable Oct. 1 to stockholders of record Sept. 13.

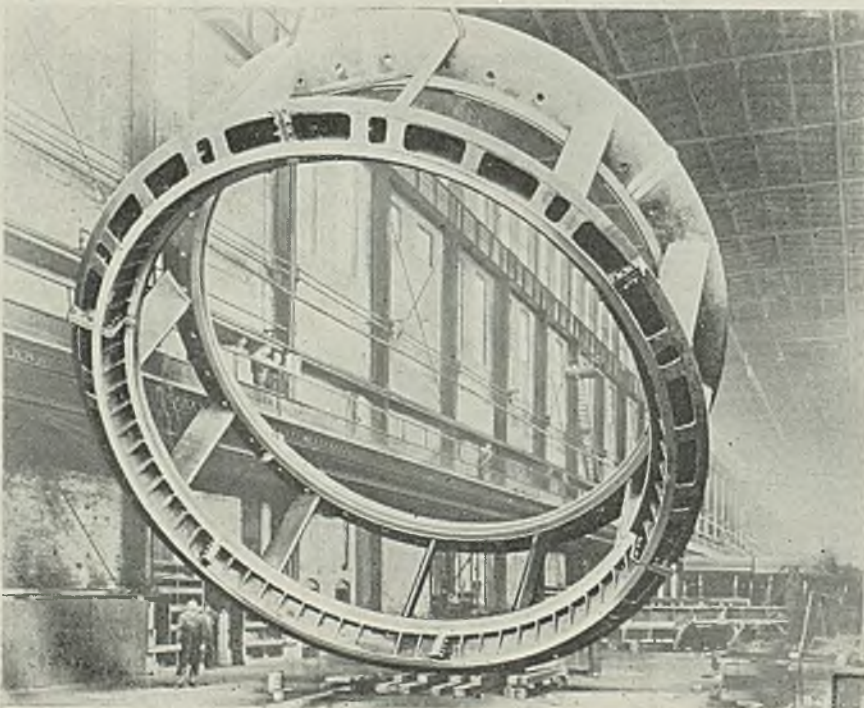
Midvale Co., Nicetown, Pa., declared a dividend of \$1.50 per share, payable Oct. 1 to holders of record Sept. 18. This will bring total disbursements so far this year to \$3.50 a share. Last year \$5 was paid.

4000 Visit Steel Plant On Tomato-Day Festival

More than 4000 visitors toured the American works of the Carnegie-Illinois Steel Corp., Elwood, Ind., recently on Indiana's first annual tomato festival day.

American works with the city's other industries held open house during the day. Visitors received souvenir booklets giving the history of works and a short description of the processes employed.

Machining a 250,000-Pound Turbine Speed Ring



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THIS cast steel speed ring weighing 250,000 pounds will form part of one of the two 55,000-horsepower hydraulic turbines under construction at Allis-Chalmers Mfg. Co.'s Milwaukee plant for the TVA Pickwick landing project. The picture, showing partially machined bottom flanges, was taken as the piece was being turned over for machining top flanges. Cast in six sections, the speed ring has an outside diameter of 37 feet 4 inches and an overall height of 14 feet 6 inches. When completed it is understood they will be the largest propeller-type hydraulic turbines in the United States

Banner Ore and Shipping Season; All Vessels Engaged

PEACE, despite persistent drives by CIO organizers, and a tremendous production of iron ore, have featured Lake Superior mining activity this year.

More mines are in operation than in nearly a decade; old properties which heretofore have been considered practically abandoned have been reopened; all the bulk cargo carriers that could be pressed into service have been carrying ore.

Producers are so busy that the Lake Superior Mining institute, as noted recently, has called off its annual meeting, because members could not spare time to attend.

The opinions expressed in **STEEL**, April 12, that the ore movement "will be limited only by the handling capacity of lake vessels" still stand.

For this season to Sept. 1 an all-time record has been established for lake shipments, about a million tons more having been brought down than in the comparable period in 1929. From present indications only adverse weather will prevent producers from shipping more than 65,195,000 tons by lake, the amount moved in 1929.

With August figures estimated, the lake tonnage so far is 44,600,000, compared with 43,700,000 up to Sept. 1 in 1929.

Total May Reach 68,000,000 Tons

In total tonnage, including all-rail ore, it is questionable whether a new record will be set. In former years the all-rail movement was fairly heavy. It brought the 1929 total to 66,157,359 tons. In 1916—when the all-rail ore was nearly 2,000,000 tons—the sum was 66,673,000. That figure was the highest on record for a season's ore movement from the Lake Superior district. Some producers believe the total this year will be close to 68,000,000 tons.

All-rail ore amounted to 375,700 tons last year, when the aggregate was 45,203,672. Though shipments by freight car from mine to destination now are heavier, ore in commercial quantities has not been shipped all-rail to the Pittsburgh district, as some enthusiasts earlier in the season predicted.

Ore producers and vessel interests have had a chance to recoup some of the financial losses they sustained during the depression years in which the tax and royalty bills alone amounted to more than their ore income, and when most of the vessels were tied up. Prices for ore de-

livered at lower lake ports—which include increases ranging from 6 to 10 cents a ton to vessel owners—are 45 cents a ton over 1936. All of the 311 vessels in the bulk cargo fleet now are in operation, and all engaged in the ore trade.

The largest cargo of iron ore ever handled on the lakes, 15,529 tons, arrived last Friday at Indiana Harbor, Ind., in the Interlake Steamship Co.'s freighter **HARRY COULBY**. Three times this year the record has been pushed upward. **COULBY** set the mark at 15,031 gross tons; this was exceeded a few weeks later by the **L. E. BLOCK**, operated by the Hutchinson & Co., Cleveland, carrying 15,410 tons.

The situation in the scrap market has been a strong factor in addition to the increased demand for iron and steel. High prices of scrap and the difficulty in obtaining it has raised the proportion of ore consumption.

Completion of work was in sight last week on the two ore vessels being built by American Shipbuild-

ing Co. at its Lorain, O., docks, for the Pittsburgh Steamship Co., United States Steel Corp. subsidiary. Each will have capacity for 12,000 long tons. These are the first to be built on the lakes in eight years.

One will be christened the **WILLIAM A. IRVIN**, for the Steel corporation's president, and the other **GOVERNOR** (Nathan L.) **MILLER**, general counsel for the corporation.

The vessels are 610 feet 9 inches overall. Approximately 4900 tons of steel plates and shapes will be used in each. Rapid progress has been made in their construction, the keel for the **WILLIAM A. IRVIN** having been laid June 21 and for the **GOVERNOR MILLER**, July 6. They will be launched early in October.

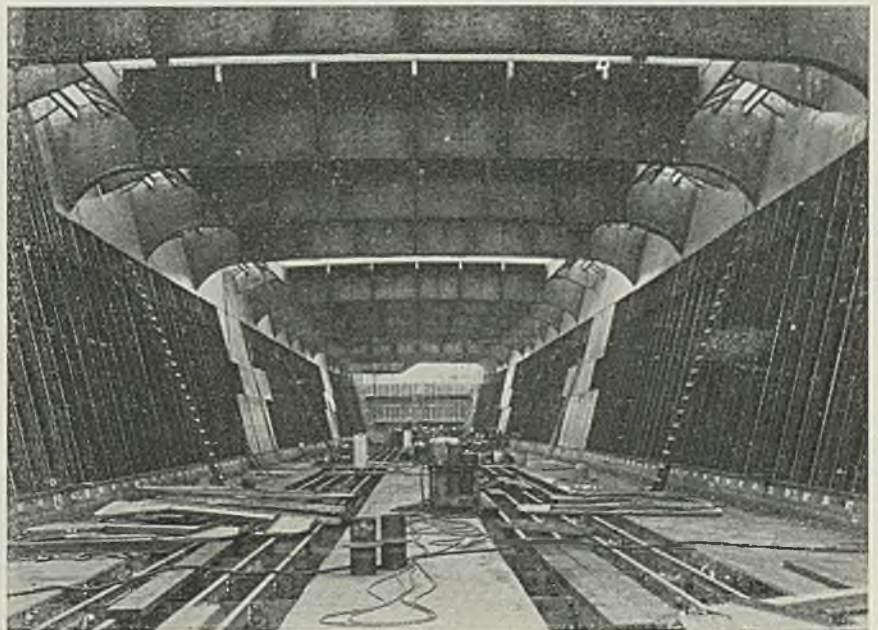
Harnischfeger Corp. To Erect 135 Steel Houses

Harnischfeger Corp., Milwaukee, will erect 135 prefabricated steel dwellings in a "planned" community fronting on the Milwaukee county Honey Creek parkway.

In association with real estate firms, a four-block tract has been subdivided into home sites. The steel houses will range from \$3500 up.

The development will be one of the first large-scale low-cost housing projects undertaken by private capital.

First New Lake Ore Carriers Since 1929



SHORTLY after Oct. 1 two bulk cargo carriers—the first to be built on the Great Lakes since 1929—will be launched for Pittsburgh Steamship Co., United States Steel Corp. subsidiary. They are practically identical in size and capacity; 4900 tons of steel was used in each (see accompanying article). Keel for one was laid June 21, for the other July 6. They will go in commission next year

Men of Industry

C T. GILCHRIST has been appointed manager, manufacturers products department, Chicago district, American Steel & Wire Co. Associated with the company since 1907, he had been assistant manager of sales in the Cleveland district for the past two years. C. J. McGregor will continue as assistant manager of the manufacturers products department.

H. D. Worthington, heretofore as-



H. D. Worthington

stant manager, woven wire fence and merchant products department in Chicago, has been transferred to the Kansas City, Mo., office as manager of sales. J. D. Crandall has been named assistant manager at Kansas City.

G. H. Waite, associated with the Wire company 25 years in sales ca-

pacities, has been appointed manager of sales, Salt Lake City office.

Thurman Haskell has been made manager of sales, Denver office, succeeding P. B. Garoutte, who has been transferred to other duties. M. K. Stewart has been appointed assistant manager. Mr. Haskell goes to Denver from the Salt Lake City office where he held a similar position, while Mr. Stewart previously had been in the Montana and Colorado territories where he specialized in wire rope.

The company's sales promotion and advertising department will be located in Cleveland after Aug. 30. The general sales department was moved to Cleveland some months ago. Wilmer H. Cordes remains in charge of sales promotion and advertising.

S. F. Wollmar, formerly of the SKF Hofors mill in Sweden, has been elected president, and N. S. Peterson, vice president of SKF Steels Inc., 369 Lexington avenue, New York.

Karl P. Fuhrman has been named general sales manager, William B. Scaife & Sons Co., Pittsburgh. He formerly was associated with Wheeling Steel Corp. as manager of the range boiler and tank division.

R. E. Howe has been elected president, Appalachian Coals Inc. Other newly elected officers include A. L. Brown, vice president; W. M. Wilshire, secretary-treasurer, and T. A. Day, assistant secretary.

Leonard T. Beecher, formerly treasurer, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has become vice president and secretary-treasurer of Southern States Iron Roofing Co., Savannah, Ga., in which he recently purchased an interest.

C. E. Jeremias and E. A. Smith have been appointed field engineers in charge of the newly opened sales-

engineering office at Detroit for Mathews Conveyer Co., Ellwood City, Pa., with headquarters at 2842 West Grand boulevard.

R. W. Johnson has been elected executive secretary, Concrete Reinforcing Steel institute, Chicago. He was associated with the institute from 1927 to 1935, being secretary for the last two years of that period. With Mr. Johnson will be associated W. S. Thomson as technical secretary.

C. W. Phillips, general master mechanic of the Warren and Niles, O., district of Republic Steel Corp., has been made general master mechanic of the Corrigan-McKinney division in Cleveland which includes the new continuous strip mill nearing completion. C. S. McKinney succeeds Mr. Phillips.

P. C. Day has been named vice president, Falk Corp., Milwaukee. Mr. Day joined the corporation in 1910 as chief engineer to direct the work of pioneering helical and herringbone gearing in the United States. He will remain in charge of engineering with the title vice president, chief engineer.

W. P. White, with offices at 1208 North Broad street, Philadelphia, has been appointed district manager in charge of steel and tube sales in the eastern and southern Pennsylvania district by the steel and tube division of Timken Roller Bearing Co., Canton, O. C. H. Kuthe will assist Mr. White in his new work.

A. R. Adelberg, district manager in charge of Timken steel and tube division sales in New York city, with offices at 165 Broadway, will also supervise steel and tube sales in the Philadelphia district.

S. J. Simmons, manager in the New York district for Aluminum Co. of America for the past nine



C. T. Gilchrist



J. D. Crandall



Thurman Haskell



G. H. Waite

years, has been named assistant general sales manager, with headquarters in Pittsburgh. He began his association with the company in 1913. Mr. Simmons will continue to handle affairs connected with the New York office, in addition to his new duties.

Joseph Gardberg has been named manager of the new district office in New Orleans for Cutler Hammer Inc., effective Sept. 1. A graduate



Joseph Gardberg

of Georgia Tech, Mr. Gardberg has had years of experience as a consulting engineer and in various other technical capacities in the electrical industry. The new office, located at 539 Gravier street, will operate under jurisdiction of A. C. Gibson, of Cutler-Hammer's Atlanta, Ga., office.

Died:

ANDREW W. MELLON, financier, statesman and philanthropist, who died last Thursday night at South Hampton, N. Y., in his eighty-third year, had extensive financial interests in iron and steel and related manufacturing enterprises. Chief among these are the Aluminum Co. of America, Bethlehem Steel Corp., Carborundum Co., the Koppers Co., American Locomotive Co., Pullman Standard Car Mfg. Co., Westinghouse Airbrake Co., Westinghouse Electric & Mfg. Co., American Rolling Mill Co., Allis-Chalmers Mfg. Co., and Pittsburgh Coal Co. He had a large interest in McClintic-Marshall Corp., one of the leading fabricators of structural steel, which some years ago was absorbed by Bethlehem.

He had the distinction of serving as secretary of the treasury under three presidents, and closed his public career in the United States' foremost diplomatic post, ambassador to Great Britain. With his broth-

er, R. B. Mellon, in 1913 he founded the Mellon Institute of Industrial Research. His greatest public benefaction was the National Gallery of Art, a \$50,000,000 project in Washington, to which he devoted the last active days of his life.

John S. Newberry, 71 member of pioneer Michigan family and long active in business and industry in the Detroit district, at his summer home in Watch Hill, R. I., Aug. 23. After completing his college education, he became assistant manager, Detroit Steel & Spring Co., later being associated with Detroit Steel Casting Co. as president.

Charles P. Woodworth, 56, since 1909 vice president, Weber Chimney Co., Chicago, in that city, Aug. 12. A structural engineer, he specialized in reinforced concrete chimneys. He had been inactive in business since 1934.

Activities of Steel Users and Makers

REYNOLDS METALS CO., New York, is working on a new type of aluminum coated steel sheet and wire, said to display unusual resistance to corrosion. The new product to be marketed under the name "Al-plate," will resist temperatures up to 1800 degrees Fahr. It is understood that the aluminum coated sheets will be used principally for food containers, and aluminum-coated wire can be used for most products where corrosion resistance is a factor.

Inland Steel Co., Chicago, has moved its St. Paul office into new quarters in the First National Bank building.

Hickman, Williams & Co., pig iron, ferroalloys, coal and coke, has moved its New York offices from 30 East Forty-second street, to 300 Madison avenue, room 902. Norman E. Craig is district manager.

Waghorne-Brown Co., 44 School street, Boston, has been appointed representative by Bethlehem Fabricators Inc., Bethlehem, Pa., for the states of Maine, New Hampshire, Vermont, and central and eastern Massachusetts.

Rustless Iron & Steel Corp., Baltimore, has opened a mid-western sales office under the management of Edward P. Geary, at 4013 Milwaukee avenue, Chicago. Mr. Geary served as district manager for Colonial Steel Co. in Chicago for several years.

Meetings

STEEL CONSTRUCTORS PLAN NEW TYPE OF MEETING

Program for the fifteenth annual convention of the American Institute of Steel Construction at the Greenbrier hotel, White Sulphur Springs, W. Va., Oct. 26-29, is being arranged to permit more thorough study of the problems of the industry and to give an opportunity for more business to be transacted.

General business sessions are scheduled for the mornings with afternoons for special forums, conferences and group meetings, an arrangement being tried for the first time. Social events are planned for the first two evenings, the annual banquet on the third evening and get-together dinner on the fourth.

The convention will be preceded by a meeting of the board of directors on the evening of Oct. 25 and concluded with another meeting for election of officers.

INSTITUTE MEMBERS PLAN INFORMAL MEETING

Approximately 200 steel executives, members of the American Iron and Steel institute, are expected to attend an informal meeting at the Greenbrier hotel, White Sulphur Springs, W. Va., Oct. 23-25. An invitation affair, the meeting will have no set business program but will be devoted to golf and other social activities, according to present plans. Whether this function will become an annual one has not been decided.

PURCHASING AGENTS OF BALTIMORE TO HOLD SHOW

Purchasing Agents' Association of Baltimore will hold its second annual Manufacturers' Products exhibit at the Lord Baltimore hotel, Oct. 19-21. Because of the success of last year's exhibit, which lasted a day and a half and attracted 4700 visitors, the show will be kept open for three days.

Approximately 100 manufacturers in the Baltimore territory will sponsor exhibits; last year the total was 60. Frank H. Carter, Dietrich Bros. Inc., Baltimore, is chairman of the exhibit committee.

A.I.M.E. AND A.S.M.E. TO HOLD JOINT COAL MEETING

A meeting on coal is to be held in Pittsburgh, Oct. 27-29, under joint sponsorship of the fuels division of the American Institute of Mining and Metallurgical Engineers and coal division of the American Society of Mechanical Engineers. Eleven papers are scheduled for presentation. Several plant visitations are being arranged.

First Half Pig Iron Output Near 1929 Record

Compiled by American Iron and Steel Institute

DETAILS of pig iron and ferroalloy production in the United States during first half of 1937, compared with first and second halves of 1936 are presented in the accompanying table. A brief summary was published in STEEL Aug. 16, page 22. Pennsylvania holds its first place in production of steelmaking iron with 6,082,309 gross tons, Ohio second with 3,649,478 tons and the Illinois-Indiana district third with 3,499,518 tons. The total of 19,975,500 tons of pig iron and ferroalloys is only 1,844,560 tons less than first-half production in 1929, the record year, which amounted to 21,820,060 tons.

HALF-YEARLY PRODUCTION OF PIG IRON AND FERRO-ALLOYS BY STATES

States	BLAST FURNACES (a)				PRODUCTION		
	In blast Dec 31, 1936	June 30, 1937			First 6 months 1936	Second 6 months 1936	First 6 months 1937
		In	Out	Total			
PIG IRON:							
Mass.....	0	1	0	1	932,244	1,288,278	1,420,179
New York...	13	14	5	19			
Penna.....	53	55	17	72	3,752,592	5,350,283	6,453,907
Maryland....	5	6	0	6			
West Va.....	3	3	0	3	965,692	1,136,414	1,323,105
Kentucky....	1	2	0	2			
Tennessee...	1	1	2	3	995,852	1,002,360	1,285,846
Alabama.....	15	17	2	19			
Ohio.....	36	35	10	45	3,227,197	3,979,458	4,175,367
Illinois.....	13	16	7	23			
Indiana.....	15	14	4	18	1,890,895	2,277,404	2,558,190
Michigan....	7	7	0	7			
Minnesota...	2	2	0	2	252,318	248,544	429,485
Iowa.....	0	0	0	0			
Missouri.....	0	0	1	1	252,318	248,544	429,485
Colorado....	2	3	0	3			
Utah.....	1	1	0	1	13,367,785	16,848,762	19,482,002
Total.....	167	177	48	225			
FERRO-ALLOYS:							
New York...	0	0	0	0	103,533	139,643	147,354
New Jersey..	0	0	0	0			
Penna.....	7	7	2	9	145,565	184,898	216,969
Virginia.....	0	1	0	1			
West Va.....	0	0	0	0	49,067	25,761	46,047
Tennessee...	0	0	2	2			
Alabama.....	0	1	0	1	86,182	77,991	83,128
Ohio.....	2	1	1	2			
Iowa.....	0	0	0	0	384,347	428,293	493,498
Total.....	9	10	5	* 15			
Grand total.....	176	187	53	240	13,752,132	17,277,055	19,975,500

(a) Completed and rebuilding pig iron furnaces.

* Blast furnaces only. Electric furnaces not included.

† Includes ferro-alloys made in electric furnaces.

HALF-YEARLY PRODUCTION OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS

BASIC PIG IRON			
States	First 6 months 1936	Second 6 months 1936	First 6 months 1937
Massachusetts, New York.....	548,802	778,233	992,655
Pennsylvania.....	2,541,602	3,622,155	4,615,520
Maryland, West Va., Kentucky, Ala.....	1,317,577	1,388,243	1,745,559
Ohio.....	1,991,322	2,393,477	2,484,959
Indiana, Illinois.....	2,142,227	2,634,767	3,024,193
Michigan, Minnesota, Colorado, Utah.....	526,071	592,445	677,365
Total.....	9,067,601	11,409,320	13,540,251

BESSEMER AND LOW-PHOSPHORUS PIG IRON			
Pennsylvania.....	1,043,471	1,577,544	1,466,789
New York, Md., West Va., Ala.....	255,096	313,506	339,359
Ohio.....	807,768	1,130,081	1,164,519
Indiana, Illinois.....	341,913	407,383	475,325
Total.....	2,448,248	3,428,514	3,445,992

FOUNDRY PIG IRON			
Massachusetts.....	277,017	327,917	429,143
New York.....			
Pennsylvania.....	441,111	500,767	575,762
Maryland, Ky., Tenn., Ala.....			
Ohio.....	73,174	92,762	143,020
Illinois, Mich., Minn., Col., Utah.....	175,067	143,176	241,479
Total.....	966,369	1,064,622	1,389,404

MALLEABLE PIG IRON			
Massachusetts, New York.....	180,618	226,412	278,479
Pennsylvania.....			
Ohio.....	348,874	356,540	377,372
Indiana, Illinois, Minnesota.....	299,533	305,080	399,447
Total.....	829,025	888,032	1,055,298

FERRO-ALLOYS BY KINDS			
Ferro-manganese and spiegeleisen.....	177,284	217,835	237,335
Ferro-silicon.....	178,847	181,643	215,437
Other ferro-alloys.....	28,216	28,815	40,726
Total.....	384,347	428,293	493,498

PRODUCTION OF PIG IRON AND FERRO-ALLOYS IN THE FIRST 6 MONTHS OF 1937

(For Sale and for Maker's Use)

	For sale	For maker's use	Total
PIG IRON:			
Basic.....	916,285	12,623,966	13,540,251
Bessemer and low-phosphorus.....	138,689	3,307,303	3,445,992
Foundry.....	1,179,421	209,983	1,389,404
Malleable.....	922,777	132,521	1,055,298
Forge or mill.....	13,628		13,628
White and mottled, direct castings, etc.....	22,018	15,411	37,429
Total.....	3,192,818	16,289,184	19,482,002
FERRO-ALLOYS:			
Ferro-manganese and spiegeleisen.....	93,507	143,828	237,335
Ferro-silicon.....	215,195	242	215,437
Other ferro-alloys.....	40,567	159	40,726
Total.....	349,269	144,229	493,498
Grand total.....	3,542,087	16,433,413	19,975,500

Labor

REPUBLIC HEARING IS RESUMED IN CEVELAND

The hearing on the national labor relations board's complaint against Republic Steel Corp. was resumed in Cleveland last Friday, following conclusion of testimony in Youngstown, O. CIO members swarmed into a room in the Cuyahoga county (Cleveland) court house where Trial Examiner John T. Lindsay prepared to take testimony from workers who said they were refused reinstatement after the strike. Testimony at Youngstown and Canton, O., indicated that certain employes had not reported for work until long after mills reopened.

DRIVE AT MACHINE PLANTS

In an election to designate sole collective bargaining agent, the CIO was reported last week to have won, 261 to 159, at the plant of the R. K. LeBlond Machine Tool Co., Norwood, Cincinnati suburb. No strikes have developed in the union's drive to organize machine tool plants in the district.

1314 Tons Steel Used In All-Welded Building

All-welded construction made possible high-speed and economical erection in a plant addition for the Lincoln Electric Co., Cleveland. Claimed to be "the largest all-welded industrial building," it required 1314 tons of steel, erection of which was started July 7 and practically completed Aug. 2. Speed of field work is indicated by erection of 93 tons in one eight-hour day.

The two-story 200,000-square foot structure employs the new welded rigid-frame saw-tooth design utilizing tree-form columns developed by the Austin Co., Cleveland, which designed and erected the building. All cross members and trusses are eliminated, enabling utilization of all space from floor to ceiling.

The form of structural members, made possible by welding, supplies extra strength where stress is greatest. This is estimated to have permitted a 20 per cent saving in amount of steel required.

In a total of 29,600 linear feet of welding more than 5½ tons of welding electrodes were used.

Nearly 16 per cent of the \$1,000,000,000 state highway taxes collected in 1936 was assigned to non-highway use, according to the bureau of public roads, department of agriculture. Diverted taxes totaled \$169,344,000, an increase of \$22,202,000 over 1935.

District Steel Rates

	Percentage of Open-Hearth Capacity Engaged in Leading Districts		Ingot Districts	
	Week ended Aug. 28	Change	1936	1935
Pittsburgh . . .	83.4	+3.9	74	44
Chicago	86.5	none	72½	57
Eastern Pa. . .	65	none	50½	33
Youngstown . .	73	none	79	62
Wheeling	89.5	+0.3	98	78
Cleveland . . .	79.5	none	79½	56
Buffalo	86	none	81	37
Birmingham . .	96	none	64	40½
New England . .	60	-15	85	73
Detroit	100	+5	100	94
Cincinnati . . .	93	none	76	†
St. Louis	84	none	†	†
Average	83	+2	73	52½

†Not reported.

Production

WITH production in the Pittsburgh district up 3.9 points to 83.4, slightly higher than three weeks ago, and small increases at Wheeling and Detroit, the national operating rate last week regained 2 points, to 83 per cent. This was only 1 point below the rate at the end of July and beginning of August. Only in New England was there a decline last week.

Cleveland—Unchanged at 79.5 per cent, with the same rate scheduled for this week.

St. Louis—Unchanged at 84 per cent for the second consecutive week.

Cincinnati—Unchanged at 93 per

cent, only two open hearths being idle in the district.

Buffalo—Unchanged at 86 per cent with 12 blast furnaces and 37 open hearths in production.

Chicago—Unchanged at 86.5 per cent of capacity, the highest rate of the year. Backlogs promise continuation of this rate, barring repair delays.

Pittsburgh—Increased 3.9 points to 83.4 per cent of capacity. National Tube Co. has added two open hearths at McKeesport, Pa., and next week will light another. Carnegie-Illinois Steel Corp. also increased its production at Clairton, Pa.

Detroit—Up 5 points to 100 per cent, with all 21 open hearths on all week.

Central eastern seaboard—Unchanged at 65 per cent of capacity. Minor adjustments were made but they were not sufficient to change the average rate.

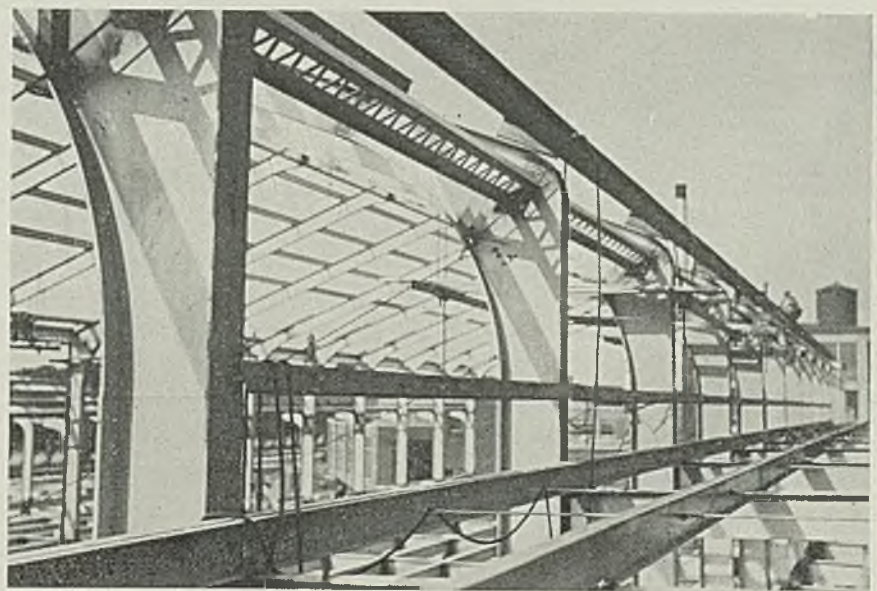
Youngstown, O.—Unchanged at 73 per cent, with 62 open hearths, three bessemer and 21 blast furnaces active. Bessemer department of Carnegie-Illinois Steel Corp. will start working full this week preparing steel for finishing in the open hearth.

Birmingham—Unchanged at 96 per cent of capacity.

Wheeling—Slight rise of 0.3 point to 89.5 per cent.

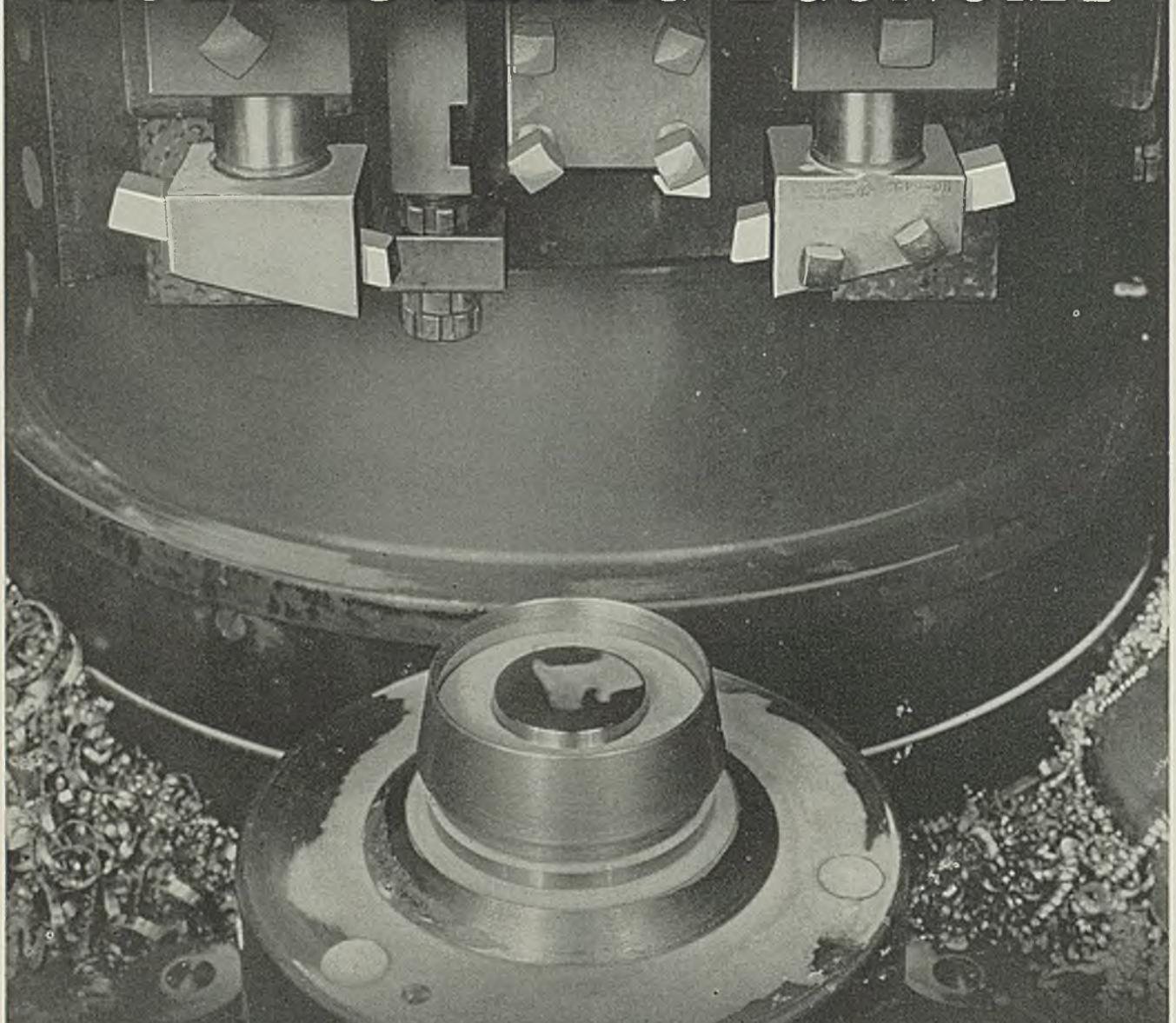
New England—Down 15 points to 60 per cent, the lowest rate this year. Seven open hearths are in production, with probability of a slight increase this week.

Tree-Form Sections in All-Welded Building



WELDED tree-form sections branch from columns into roof girders in the Lincoln Electric Co.'s new plant, Cleveland. Fabrication of the 1314 tons of steel in the building was done entirely by welding

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MIRRORS OF MOTORDOM

DETROIT

THOSE students of the crystal ball who specialize in divinations concerning the future of industrial Detroit will take you out on Mound road beyond the city limits and east of Woodward avenue, and, pointing to the broad sweep of level farm land whisper here is a coming industrial center.

They will point to the buildings of Rotary Electric Steel Co., hive of activity, and tell you about plans for alloy steel production there.

They will point to graders, scrapers and steam shovels at work on a plot immediately north where soon a new Dodge truck plant and a new export truck plant will materialize.

They will tell you convincingly that Briggs Mfg. Co. recently purchased a large tract of land in the same neighborhood and shortly will announce building plans. Briggs, by the way, has purchased 13 acres of property from Hudson near its Mack avenue plant, and is inquiring for sketches on a new plant, apparently making good its threat to expand facilities following collapse of what appeared to be an in-the-bag merger with Motor Products Corp.

Railroad Extension Rumored

Motor Products manufactures hood hinges, windshields, quarter windows, ventilating windows, trim and garnish moldings and instrument panels. As an important supplier for Chrysler, the company fits in squarely with the Briggs picture in view of the latter's moving toward becoming the "Fisher Body" of Chrysler. Incidentally, elimination of movable windshields from 1938 Chrysler lines has meant a considerable drop in Motor Products' business, but sales officials are driving hard toward filling the gap.

Getting back to the crystal-gazers, they will draw you to one side and in subdued tones relate the news that two other large companies have taken options on land in the Mound-Nine-Mile area, but they will refuse to name them. When you ask

BY A. H. ALLEN
Detroit Editor, STEEL

how the present single-track line of the Michigan Central railroad can possibly serve the needs of this new industrial community, they will smile and tell you that the MC already has extended its switching limits from the Eight-Mile to the Nine-Mile road and has drawn up plans for laying extensive new trackage to serve the unborn plants.

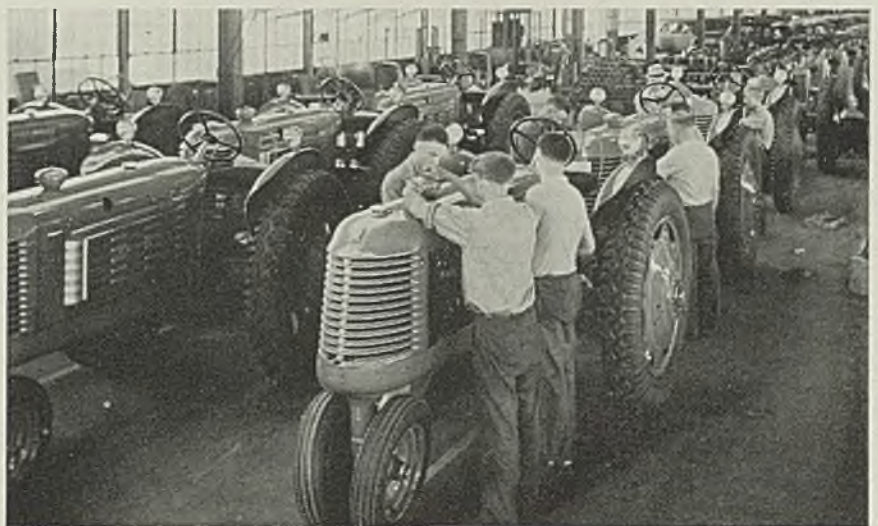
Then your seers will tell about the mad scramble for choice real estate which has developed here in recent months and you will smile, recalling another mad scramble for Detroit real estate some six or seven years ago which many blame for the catastrophic occurrences in 1932 and 1933 in motordom's banking

circles. But the prophets scoff at such recollections and tell you to come back in a year, two years, to see how quickly trees and green fields are transformed into an automobile production center.

Chrysler, in line with most other car builders, is whipping into shape some ambitious plans for production in the next couple of years, but is finding its facilities more and more cramped. It is rumored corporation officials are now weighing some expansion plans which make those already announced pale into insignificance. So far, they add up to this: Sharp production increases in Dodge trucks, Plymouth commercial cars, Chrysler Royal line; and a new low-price model.

Expansion programs are now under way at both Jefferson and Kercheval plants of Chrysler. At the latter, 76,000 square feet of floor

Graham Enters Farm Tractor Field



GRAHAM-BRADLEY farm tractors soon will roll from the production line at the Graham factory in Detroit at a rate of 25 units a day. Designed especially to use pneumatic tires and to work at higher speeds, the new tractor has many features similar to those of the automobile, including ignition, self starter, battery and generator. It will be sold through a mail order house



MIRRORS OF MOTORDOM

space will be added for work on body building "in the white," or unfinished state; at the former an additional 110,000 square feet of space will be available for DeSoto and Chrysler motor assembly. Changes in motor lines involve rearrangement of about 3000 machines and installation of a number of new tools.

ACROSS and down the Detroit River at Ojibway, Ont., slumbers the long-idle plant formerly owned by the Canadian Steel Corp., United States Steel Corp. subsidiary, and now taken over by Dominion Steel & Coal. Briefly, it comprises a blast furnace, never operated, wire mills, tinning machines and a galvanizing shop, representing an investment of about \$1,500,000.

Last week it was announced by Dominion officials that the plant will be opened Sept. 1, giving employment to 570. It is doubtful whether the blast furnace ever will be recommissioned, but it is understood the tinning and galvanizing equipment will be returned to operation, as well as the wire mills, giving jobs eventually to 1200. Some equipment will be needed, in view of five years' inactivity. Capacity of the tinning and galvanizing departments is estimated at 100,000 tons each annually.

The dominion government is interested in the reopening because Ojibway is obligated by debentures totaling around \$350,000 held by a public utility. Workers will be taken off public relief rolls.

OFFICIAL automobile production figures for the United States and Canada in July place the total at 456,775, lowest monthly output since last February, which brings the seven-month total to 3,374,195, comparing with 3,045,714 in the same period of 1936 and 2,674,825 in 1935. Thus the gain this year over last in the first seven months figures about 11 per cent.

August production should come pretty close to 370,000, well ahead of last year's 275,934. September again will be the low month of the year, but when the 1937 books are closed, the industry undoubtedly will be well over the 5,000,000 mark or about 10 per cent ahead of last year.

One of the brightest spots in the automotive panorama is the notable spurt in truck sales. In seven

Automobile Production

Passenger Cars and Trucks—United States and Canada
By Department of Commerce

	1935	1936	1937
Jan.	300,335	377,244	399,634
Feb.	350,346	300,810	383,699
March ...	447,894	438,943	519,177
April.	477,059	527,625	553,415
May	381,809	480,518	540,357
June	372,085	469,368	521,139
July	345,297	451,206	*456,775
7 mos.	2,674,825	3,045,714	3,374,195
Aug.	245,075	275,934	.....
Sept.	92,728	139,820	.....
Oct.	280,316	230,049	.....
Nov.	408,570	405,799	.....
Dec.	418,317	*518,958	.....
Year	4,119,811	*4,613,274	.....

Estimated by *Ward's Automobile Reports*

Week ended:	
July 31	86,403
Aug. 7	78,736
Aug. 14	103,250
Aug. 21	93,339
Aug. 28	83,310

	Week ending	
	Aug. 28	Aug. 21
General Motors	29,100	32,954
Ford	26,000	26,000
Chrysler	23,950	26,600
All others	4,260	7,785

†Estimated. *Revised.

months of this year, truck and commercial car production has reached 617,626, and is still holding at a high level. As already indicated, plans are being drawn to put special emphasis on truck production for next year, which should see all present records eclipsed.

Speaking of trucks, special interest is attached to a new design being tested by United Parcels Corp., Long Island City, N. Y. Built in a cab-over-engine style, the unit is powered with a 4-cylinder Continental engine of standard design, except that it is steam cooled, dispensing with the usual radiator, fan and water pump. A small amount of water is used in the cooling system, which is transformed into steam, escaping into a large flat condenser where it is cooled and drains back into the engine.

Resulting high engine temperature is said to provide improved fuel economy. The faster the engine is operated the faster the steam circulates, which results in practically a constant engine temperature and resultant higher efficiency. The company is now building ten units after

initial experiments on one of the new trucks. Weight is 4800 pounds empty. Body has 350 cubic feet of space. In addition to steam cooling are a number of other unusual features, including absence of spring shackles, the springs being arranged so that the ends slide on steel guides.

Success of the steam-cooled engine may suggest its application to rear-engine designs where engine cooling has been one of the problems. Location of the condenser, which must be fairly large, might prove a difficulty in passenger cars, but it has been suggested that the steel top could be made into a suitable condenser by making it of a double panel.

The United Parcels organization operates package delivery service in New York, Cincinnati and on the West Coast. Their experience with this new type of truck is being watched closely by automotive engineers.


ANEW conception of what is necessary to improve engine design is presented by David E. Anderson of Bohn Aluminum & Brass Corp. who cites tests made in the Bohn laboratory showing that proper gasification, preparation and distribution of the fuel is the one obstacle preventing use of a maximum efficient compression ratio of approximately 8½ to 1. He believes this obstacle can be overcome by means of a fuel injection pump which compresses a rich mixture at a pressure of about 1000 pounds per square inch before it is introduced in the combustion chamber.

The mixture, too rich to self ignite, then would combine during its admission to the cylinders with the air introduced into the cylinders either by suction or by means of a supercharger, thereby obtaining the proper fuel-air ratio. This would result, says Mr. Anderson, in a smooth engine, free from detonation and with a torque and power output far in excess of anything available commercially today.

The fuel injection pump, the supercharger and lighter construction alloys are three keys to engine efficiency which Mr. Anderson believes inevitable for power plants of the future. The supercharger, of course, already is being used; the fuel injection pump for gasoline engines is something which lies ahead.

EXPERIMENTS are being conducted on palladium plating for interior automobile hardware. While considerably more expensive than chrome, palladium is claimed to provide a softer, richer appearing plate, adaptable to hardware on high-price cars. Another metal which has had some special applications is

(Please turn to Page 88)

A black and white photograph of a woman in athletic wear riding a bicycle. She is smiling and looking upwards. A large, long-handled welding torch is mounted on the handlebars, extending far above her head. The torch has a long, straight handle with a curved section at the top and a nozzle at the bottom. The background is dark.

HARRIS AUTOMATIC TORCHES make it possible for THE CLEVELAND WELDING COMPANY to produce 1600 bicycles daily. Increased production with simultaneous reductions of 20% to 30% oxygen and fuel gases are reported by hundreds of satisfied users.

HARRIS AUTOMATIC UNITS are available in different sizes for Oxy-Acetylene welding or Oxy-City Gas brazing.

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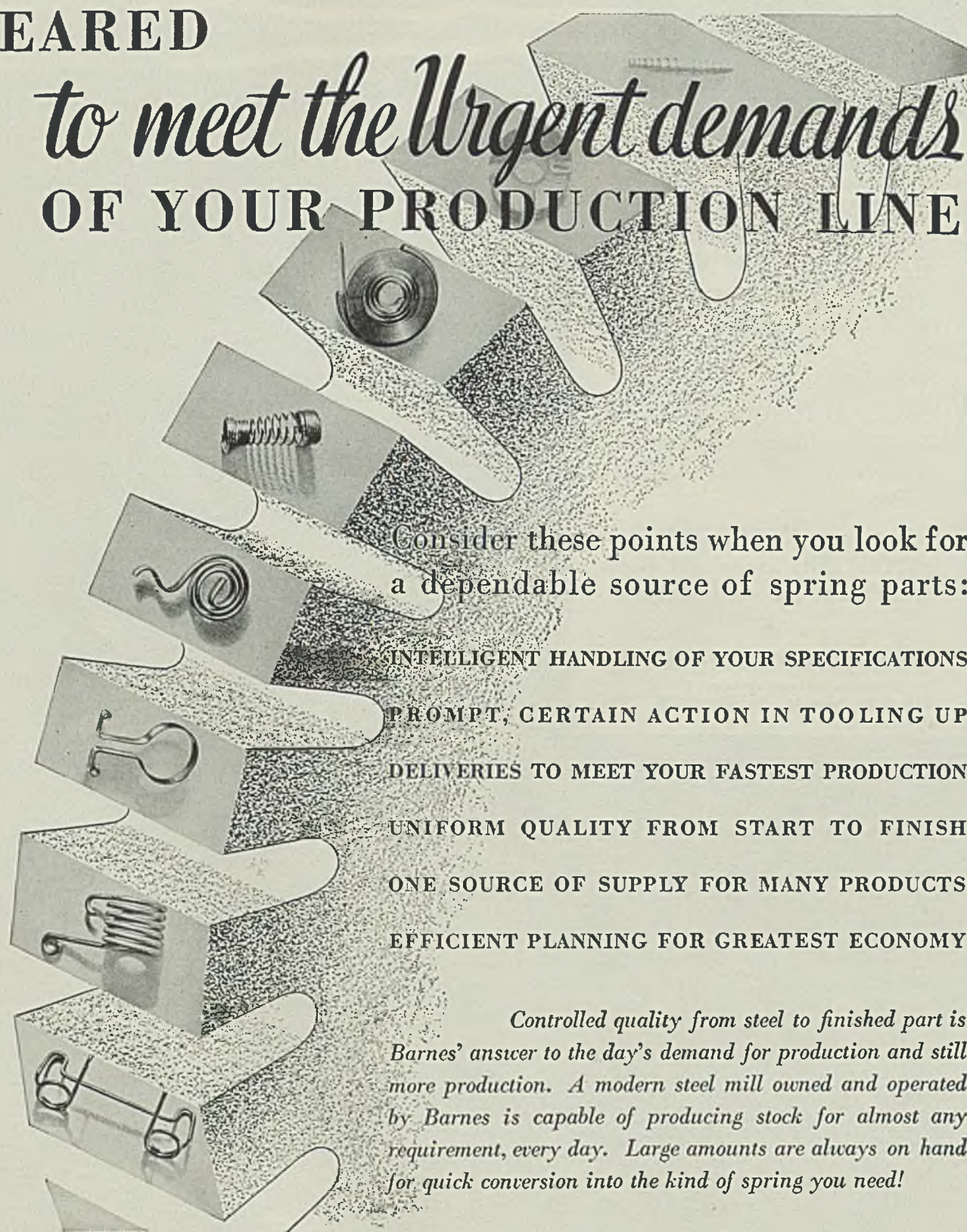
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Controlled quality from steel to finished part is Barnes' answer to the day's demand for production and still more production. A modern steel mill owned and operated by Barnes is capable of producing stock for almost any requirement, every day. Large amounts are always on hand for quick conversion into the kind of spring you need!

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***Barnes-made* SPRINGS**



WINDOWS OF WASHINGTON

WASHINGTON

AT LAST Washington is rid of congress. However, the talk all last week was whether an extra session will be called and when. The President has made no announcement, but one may be made at any time.

One of the many rumors is to the effect that he will call an extra session if he vetoes the compromise sugar bill, which passed during the closing hours of congress. The guess here is that he will veto it. He has until next Wednesday to decide.

Asked at a press conference last week about chances for a special session the President said he was trying to make up a book on it. Some of the key men in congress believe that a special session will be called, and their guess is sometime early in November. On the other hand, there are others, just as well informed, who say that it will not be called.

It is the belief of some well informed folks here that much of the unfinished business left by the first session of this congress is too urgent to wait for the regular session in January.

Wage-hour Bill Presses

One of the subjects of particular interest to steel and other industries which will come to the fore at the next session, be it regular or special, is the matter of wages and hours. The unions certainly made all the fuss they could to get enactment before adjournment but the republicans and southern democrats who are opposed to the bill, were able to keep it in the rules committee of the house without action. It is interesting to note, also, that a democratic caucus was called on the subject, but no quorum could be obtained because the southern democrats refused to attend. This put a finale to the hours-wages bill for the session.

Many bills were introduced at the last session of special interest to the steel industry. Of these, the Wheeler anti-basing point bill and the bills dealing with prohibition of exports

BY L. M. LAMM
Washington Editor, STEEL

of iron and steel scrap were outstanding.

The latter bills in the senate will be taken up in hearing before the senate military affairs committee when congress reconvenes in January, unless some change is made in present plans. There are several stream pollution bills in both houses of congress of interest to the industry. Pollution bills were passed by both houses and sent to conference but agreement was reached that the matter would hold over until the January session.

Pending Bills Are Alive

It should be recalled that all of the bills pending when congress adjourned will still be pending when it reconvenes because this was the end of a session and not of a congress.

The status of some of the most important bills of interest to industry is as follows:

S.1490, introduced by Senator Bone, Washington, Feb. 11, to build all government ships in navy yards. Referred to senate committee on naval affairs with no action taken.

Anti-basing point bill (S. 1581) introduced by Senator Wheeler, Montana, Feb. 15 and referred to the senate committee on interstate commerce with no action taken.

H. R. 1955, introduced by Representative Knutson, Minnesota, Jan. 6, pertaining to a palm oil tax. Referred to the ways and means committee.

S.2025, introduced March 29 by Senator Schwellenbach, Washington, to prohibit steel scrap exports. Referred to senate military affairs committee. No action.

Amendments to Schwellenbach bill by Senator Austin, Vermont, May 11, also referred to military affairs committee.

S. Joint Res. 180 introduced July 22 by Senators Berry, Tennessee,

and Bridges, New Hampshire, to create a scrap committee. Also referred to military affairs committee.

A government armament monopoly bill introduced by Representative Johnson, Minnesota (H. R. 2907) Jan. 13. Referred to house military affairs committee. No action.

H. R. 4344 introduced Feb. 4 by Representative Magnuson, Washington, suggesting building of all naval ships in navy yards. Referred to house naval affairs committee. No action.

Representative Kopplemann, Connecticut, April 9 introduced H. R. 6278 proposing a steel scrap embargo. Referred to military affairs committee.

H. R. 6322, introduced April 12 by Representative McReynolds, Tennessee, dealing with a tin ore supply. Referred to house committee on foreign affairs. No action.

H. R. 7454, introduced June 9 by Representative Crawford, Michigan, another scrap embargo bill. Referred to house committee on interstate and foreign commerce. No action.

Representative Kopplemann of Connecticut introduced another bill (H. R. 7967) July 22, providing for a more complete scrap embargo. Referred to house military affairs committee. No action.

"Referred; No Action"

H. Res. 134, introduced by Representative Ellenbogen, Pennsylvania, Feb. 24 to investigate the steel industry. Referred to the house committee on rules. No action.

Representative Stack, Pennsylvania, Feb. 24 introduced a resolution (H. J. Res. 245) to provide a naval steel factory. Referred to house committee on naval affairs. No action.

H. J. Res. 451, introduced July 22 by Representative White, Ohio, to create a scrap committee. Referred to house committee on rules. No action.

H. J. Res. 452 by Representative Lamneck, Ohio, similar bill intro-

duced same day for same purpose. Referred to same committee and no action.

H. J. Res. 466, introduced July 29 by Representative Crawford, Michigan, to prohibit pig iron exports. Referred to house committee on foreign affairs. No action.

Even taking into consideration the fact that as the house minority leader, Bertrand H. Snell, is a republican, he made some rather interesting statements as the congress adjourned.

"When the gavel fell Saturday," he said, "we reached the end of the greatest do-nothing session of congress in the last half century. Notwithstanding overwhelming majorities in both houses, and all the flamboyant promises of the last campaign, the democratic party did not enact a single major piece of constructive legislation for the improvement of the national economic situation.

"The first session of the seventy-first congress appropriated in excess of ten billion dollars, more than twice the annual appropriation in the decade prior to 1933."

In another part of his statement the minority leader took a parting shot by stating that "both congress and the administration have refused to investigate and expose the most shocking political scandal of our times the bold and flagrant hijacking of corporations, in direct violation of the federal corrupt practices act, through the sale of the President's autographed edition of the democratic book of 1936."

UNEMPLOYMENT CENSUS BILL IS HAZY MEASURE

The President has made an about-face on the question of the unemployment census. During the early hours of the last congress when questioned about the matter he did not seem to feel that any good could be accomplished by such a census. Either he changed his mind or seeing that congress apparently wanted a census, he made the best of it.

At a press conference last week, discussing this matter, the President stated that the questions would be made simple to avoid any door-to-door bell ringing.

The bill as it passed congress on the last day of the session, is rather indefinite and no one knows yet who is going to take the census. Someone high in government circles said the other day that they wished General Hugh Johnson would take it because he said at one time during its consideration, in urging it, that it could be taken in 24 hours. They do not agree with him. It is estimated that the cost will be from \$4,500,000 to \$5,000,000. It is called "a census of partial employment, unemployment, and occupations."

Provision is made in the law that it shall be taken on or before April

1, 1938. It is also provided that questions to be included shall be determined upon by a special committee consisting of the secretary of commerce, the secretary of labor and a number of other government officials.

Without stating who the "administering agency" shall be the congress provided further that "the administering agency is authorized to call upon the other departments or agencies of the federal government for information relating to, and for assistance in connection with, the census herein provided for; and the administering agency is authorized to co-operate with and to use the information secured by such state and local agencies as may have data pertinent to this census."

While no government agency has yet been designated to take this census it is believed in most quarters that it will be done by the bureau of the census of the department of commerce. Officials there, however, are not sympathetic with the idea. In fact, government officials generally are not enthusiastic over this census, which they believe will cost a lot of money and still not be reliable.

NAVY MACHINE TOOL SURVEY IS DELAYED

It is learned at the navy department that no survey has been started on the machinery needs of the various navy yards, and naval officers in charge of such matters expressed some surprise that the President should have said that this would be done soon.

At a press conference a few weeks ago, speaking of building up the American merchant marine and the fact that there will be a boom in that industry in the near future, Mr. Roosevelt said a survey would be made of the obsolescence of machinery in navy yards. While he did not specifically say so, those attending the conference got the very definite impression that if the survey was not already under way it would be shortly. Apparently, if this is contemplated the navy knows nothing about it up to this time.

UNDISTRIBUTED PROFITS TAX DELAYS RECOVERY

An extensive survey of the effects of the undistributed profits tax on business and employment has been laid before the treasury department by the National Association of Manufacturers.

The survey, the only one of its kind yet made, is based upon abstracts from letters from manufacturers in all parts of the United States describing their experiences with the undistributed profits tax, with many of them indicating the probability of increased employment if the law should be lifted. The survey was

turned over to the treasury with a view to assisting it in preparation of modifications of the law if changes are submitted to the next session of congress.

The tax, adopted last year, imposes a heavy tax penalty on net income of business not distributed as dividends. The National Association of Manufacturers and other leading business organizations opposed adoption of the measure as a potential deterrent to recovery.

This opposition was predicated upon a belief the measure would forestall machinery replacement and plant expansion, both needed as the result of long years of obsolescence and retrenchment during the depression. It was also opposed because of the special burden it would impose on small and medium sized companies which lack working capital.

Japan Plans for Great Machine Tool Expansion

Realizing the basic importance of machine tools in industrial growth the Japanese government expects to inaugurate official measures to stimulate production of such equipment and to encourage replacements in existing plants, according to reports received by the machinery division, department of commerce.

It is believed that some definite legislation will be proposed during the present special session of the diet. The goal is a production of about 130 to 140 million yen (about \$40,000,000) by 1941.

One proposed plan would embody a semigovernmental company with a capital of about 20 to 30 million yen to be established in co-operation with the five principal machine tool manufacturers. The latter, however, are reported to be opposed to this plan. Another project involves mobilizing the machine manufacturing industry for production of parts under direction of the government, which would build assembly plants and regulate production somewhat like the British "shadow scheme."

Information indicates that existing producers of machine tools are experiencing shortage of both engineers and skilled workmen. This is a deterrent to increased manufacture of machine tools, but it is expected that the ministry of commerce and industry will submit plans for the training of 4500 mechanics annually. According to the Japanese press, a bill for this purpose will be introduced, carrying an appropriation of 20 million yen, for establishment of training institutions in seven leading industrial cities.

Editorial

What Congress Did and Did Not Do in First Session

STRANGELY enough, individuals concerned with the welfare of industry will judge the record of the first session of the seventy-fifth congress more on the score of what was not done than on the oasis of legislation actually passed.

The list of fairly important bills that were enacted is brief:

1. Authorization for a census of unemployment.
2. Revamped Guffey coal act.
3. Wagner-Steagall housing act.
4. Neutrality act.
5. Farm tenancy act.
6. Act providing for changes in lower federal courts.
7. Act designed to plug leaks in federal income tax provisions.
8. Miller-Tydings resale price maintenance act.

Of the foregoing, industrialists generally will agree that authorization of a census of employment is potentially the most practical piece of legislation in the lot. Much depends upon how it is conducted, but if it is administered intelligently and with a sincere desire to ascertain the facts, it will accomplish more than all of the other acts combined.

Failure To Pass Visionary and Rudimentary Acts Is Positive Blessing to Industry and Nation

The revised Guffey coal bill has many friends in industry, but most of the other bills enacted arouse little enthusiasm among those who worry about satisfying stockholders at the same time they are meeting payrolls and paying the multitude of federal, state and local taxes.

Of far greater moment is the fact that congress did not pass the Supreme Court "packing" bill, the plan for executive reorganization, the hastily drawn Black-Connery hours-and-wages bill, the farm surplus control bill and the bill to create new regional power and "navigation" projects on the order of TVA.

Considering that some of these were visionary in character, that some are downright dangerous and that all were submitted in incomplete and unsatisfactory form, the failure of congress to act upon them can be construed as nothing short of a blessing to the nation.

While industrialists are congratulating themselves

that these bills did not pass and are grateful to congress for its part in blocking them, they should not overlook a number of other bills that were not given adequate, if any, attention.

Congress did practically nothing to stem the tide of wasteful government expenditure. It failed utterly to recognize the fact that government economy is essential—particularly now that the plea of an emergency no longer is valid.

It did not amend the 1936 revenue act to modify the obnoxious provision for penalizing the undistributed profits of corporations.

Congress failed to take action or even to make a start toward correcting the obvious mistakes in the social security law.

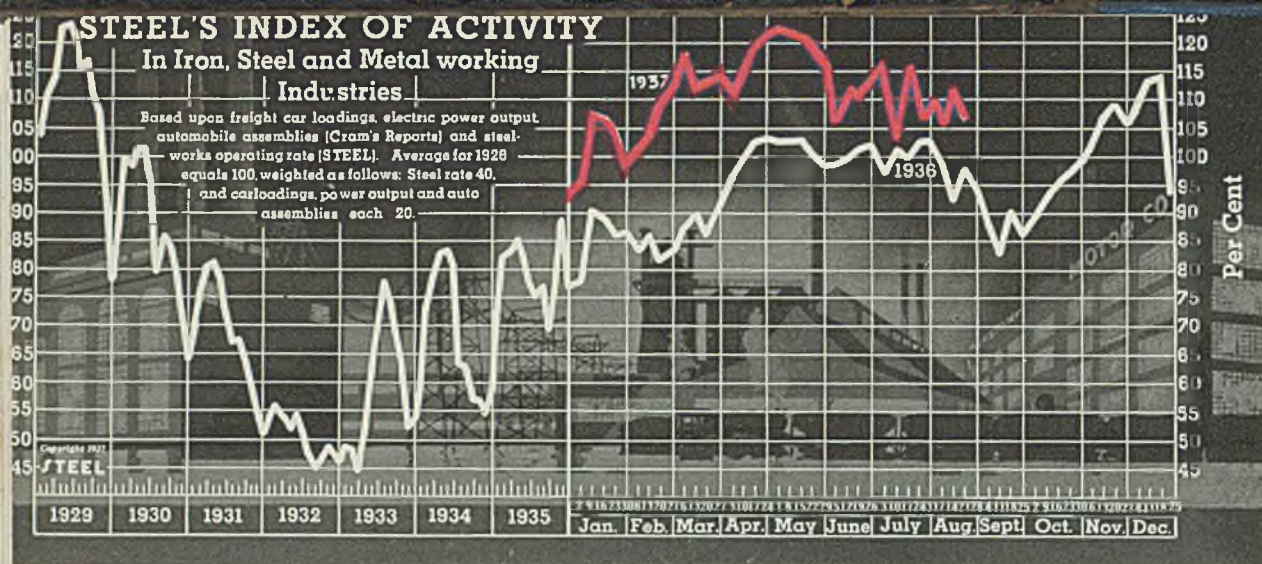
Worst of all, members of both houses were remiss in not removing the admittedly one-sided features of the Wagner relations act. This omission was all the more noticeable because many members of congress, on the occasion of the strikes in the automobile and steel industries, demonstrated their annoyance with the failure of the administration to curb lawlessness and thus went on record as recognizing the defects of the Wagner act. That they did not follow through with prompt corrective action is a black mark against the first session.

Alignment Between Left and Right Better Defined; Rule of Reason Asserting Itself in Congress

Fortunately, in the present case, no appraisal of the accomplishments of a congress can be fair unless it takes into account factors which do not show in the record of legislation enacted or omitted. During the recent session the lines of battle between the lefts and rights were more clearly defined than in any congress in decades. On one side are congressmen who have declared their intention to fight for what they claim to be needed social reforms, no matter what the consequence to the nation may be. On the other side are senators and representatives who temper their zeal for social improvement with a realization of the practical problems involved.

This last session will go down in history as the one in which the ultra-conservatives, or "Tories", were joined on numerous occasions by some liberals and many middle-of-the-roaders who could not stomach the visionary, wasteful and sometimes dangerously destructive proposals of the leftists.

The coalition of congressmen of both major parties into a legion of reason to combat the battalions of emotion—even though the former still represents a minority—is the most significant and the most gratifying feature of the first session of the present congress.



The

STEEL'S index of activity declined 4.0 points to 109.8 in the week ending August 21:

Week ending	1937	1936	1935	1934	1933	1932	1931	1930
June 5	105.1	98.8	79.3	82.3	69.9	51.0	73.5	97.9
June 12	111.4	99.4	80.0	83.6	72.1	51.1	73.2	96.2
June 19	110.3	101.0	77.3	81.8	73.9	51.8	70.9	95.0
June 26	112.8	101.9	78.4	79.4	77.0	51.6	70.6	94.0
July 3	115.3	97.5	64.1	52.3	71.4	49.2	64.1	75.0
July 10	103.8	100.9	76.5	67.8	79.1	41.7	69.4	86.9
July 17	115.7	99.9	79.8	68.1	79.4	46.9	70.0	79.1
July 24	108.0	102.1	80.8	66.4	78.8	51.5	69.7	78.7
July 31	109.1	102.5	78.4	64.6	75.9	46.1	68.9	79.2
Aug. 7	107.3†	98.7	73.4	64.6	74.7	45.1	67.0	85.6
Aug. 14	113.8†	92.6	77.5	61.4	74.2	44.6	67.4	86.2
Aug. 21	109.8*	97.7	77.0	60.3	71.6	44.9	67.3	88.5

†Revised. *Preliminary.

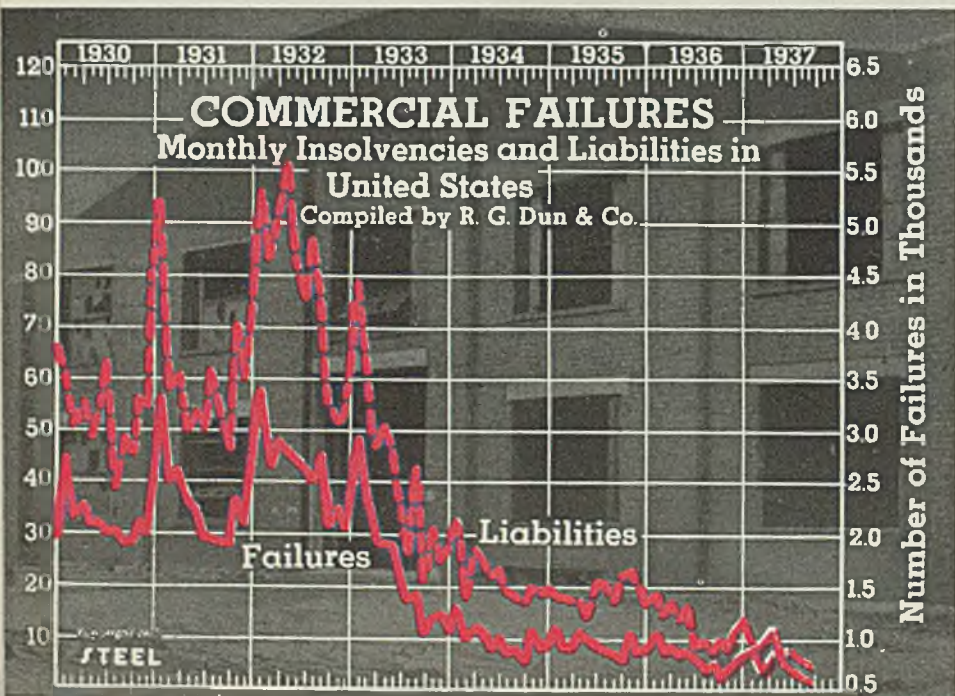
Industry Is Staging Good Contra-Seasonal Show

INDUSTRIAL activity in August has demonstrated convincingly that fears of a marked summer let-down were unfounded. In the iron, steel and metalworking industries operations are being maintained through the dog days at levels only moderately below the high peaks of the second quarter.

If allowance were made for seasonal variations, activity in the metalworking field probably would be at a record high for the recovery period. Some of the general indexes of business activity, which include the behavior of textile, lumber and other non-metal

industries—when adjusted for seasonal variations—touched new peaks for the post-depression in mid-August. Typical of these is the *New York Times*' weekly index of business activity which established a new recovery high in the week ending Aug. 14. STEEL'S index of activity at 113.8 in that week undoubtedly would have represented a recovery high if translated into terms allowing for seasonal factors.

Considering the time of year, electric power output and automobile production are running at unusually high levels. In 1936, automobile output in the weeks ending Aug. 15 and 22 was 56,679 and 73,709 cars, respectively. This year in the corresponding weeks assemblies totaled 103,250 and 93,339, respectively. Last year in the week ending Aug. 22, electric power output established a new high at 2,125,500,000 kilowatt hours. This year in the corresponding week it touched



	Failures, Number		Liabilities, Dollars (000 omitted)	
	1937	1936	1937	1936
Jan.	811	1,077	\$8,661	\$18,104
Feb.	721	856	9,771	14,089
March	820	946	10,922	16,271
April	786	830	8,906	14,157
May	834	832	8,364	15,375
June	670	773	8,191	9,177
July	618	639	7,766	9,904
Aug.	.....	655	.....	8,271
Sept.	.....	586	.....	9,819
Oct.	.....	611	.....	8,266
Nov.	.....	688	.....	11,532
Dec.	.....	692	.....	12,288

BUSINESS TREND

a new all-time record at 2,304,032,000 kilowatt hours. This is the second consecutive week in August—an off-season period—in which a new record has been made.

Freight car loadings are slightly erratic for this time of the year. The rate of steelworks operations,

Where Business Stands

Monthly Averages, 1936=100

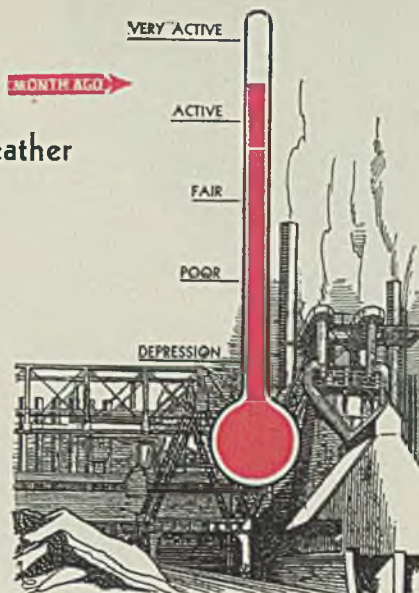
	July, 1937	June, 1937	July, 1936
Steel Ingot Output	112.2	107.0	100.3
Pig Iron Output	134.7	123.9	99.9
Freight Movement	109.9	107.3	101.8
Building Construction	134.2	135.9	113.5
Automobile Production	118.7	135.5	117.3
Wholesale Prices	110.9	111.7	100.5

while still high for the season, is easing slightly in the interim between the working off of old orders and the booking of new tonnage.

Industrial Weather

TREND:

Steady



The net result of these factors was a moderate decline in STEEL'S index for the week ending Aug. 21. The index stands at 109.8 as compared with 113.8 in the preceding week.

The usual pattern of the curve of industrial activity calls for a rather sharp decline over the Labor day week-end with a moderately sharp recovery extending into new high ground in November and December. Indications are that this trend will be observed in the remainder of 1937. The uncertain factor is the angle of the upward line with the horizontal.

The Barometer of Business

Industrial Indicators

	July, 1937	June, 1937	July, 1936
Pig iron output (Daily average, tons)	112,947	103,843	83,735
Machine Tool Index	190.5	227.6	132.6
Finished Steel Shipments ..	1,186,752	1,268,550	950,851
Ingot output (Daily average, tons)	168,763	160,914	150,874
Dodge Bldg., awards in 37 states (sq. ft.)	45,812,600	46,393,100	38,762,500
Automobile output	456,775	521,139	451,474
Coal output, tons	31,610,000	31,726,000	32,054,000
Business failures; number	618	670	639
Business failures; liabilities ..	\$7,766,000	\$8,191,000	\$9,904,000
Cement production, Bbls.	11,163,000	11,446,000	11,446,000
Cotton consumption, bales ..	583,000	681,000	603,000
Car loadings (weekly average)	762,418	744,131	706,387

Foreign Trade

	July, 1937	June, 1937	July, 1936
Exports	\$265,363,000	\$178,324,000	\$178,324,000
Imports	\$285,946,000	\$193,409,000	\$193,409,000
Gold exports	\$81,000	\$695,000	\$695,000
Gold imports	\$262,103,000	\$16,074,000	\$16,074,000

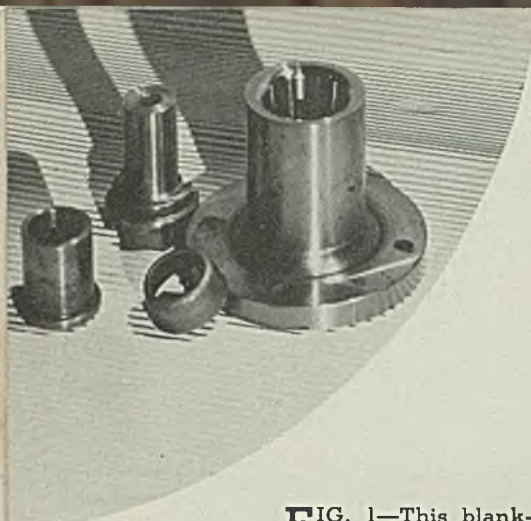
Financial Indicators

	July, 1937	June, 1937	July, 1936
25 Industrial stocks	\$216.49	\$207.41	\$220.37
25 Rail stocks	\$41.47	\$41.74	\$39.60
40 Bonds	\$84.05	\$83.91	\$87.27
Bank clearings (000 omitted)	\$25,903,000	\$24,918,000	\$24,918,000
Commercial paper* rate (N. Y., per cent)	1	1	%
*Commercial loans (000 omitted)	\$9,784,000	\$9,760,000	\$8,294,000
Federal Reserve ratio, per cent	79.7	79.5	79.2
Railroad earnings	†\$58,939,875	\$43,662,959	\$50,512,580
Stock sales, N. Y. stock exchange	20,715,360	16,443,293	34,786,729
Bond sales, par value	\$160,160,800	\$178,640,400	\$281,873,100

*Leading member banks Federal Reserve System.
†June, May and June respectively.

Commodity Prices

	July, 1937	June, 1937	July, 1936
STEEL'S composite average of 25 iron and steel prices	\$40.03	\$39.82	\$33.49
Bradstreet's index	\$11.19	\$11.27	\$10.14
Wheat, cash (bushel)	\$1.34	\$1.41	\$1.25
Corn, cash (bushel)	\$1.33	\$1.36	\$1.02



Graphitic Steel—

Its Fabrication Application to

FIG. 1—This blanking punch was made from graphitic steel containing molybdenum. Hardness of working face is 63-64 Rockwell C

MANY fields can utilize advantageously a metal combining the free machining qualities, high resistance to wear and good frictional properties of cast iron with the uniformity, ease of hot or cold working, ready response to heat treatment and good physical properties of steel. This is particularly true in the die industry.

Graphitic steel apparently combines these qualities for laboratory and service tests indicate that it will meet a need now existing in modern high-speed, heavy-duty production. This new material, which is a high carbon steel in which a substantial part of the carbon is present in the form of free graphite when the steel is ready for machining, now is being produced commercially by the Timken Roller

Bearing Co., Canton, O. for both water and oil hardening applications in the die field.

As now produced, the basic analysis of this steel carries approximately 1.50 per cent total carbon and approximately 1.00 per cent silicon. It is an electric furnace product, made under rigid control. Ingot size and stripping temperature play an important part in the successful production of this material, for once an excessive amount of free graphite has been precipitated, heat treatment will not restore forgeability to the steel.

As rolled, but before preliminary

heat treatment, graphitic steel is a hypereutectoid material composed of pearlite and free cementite with the possible occurrence of finely-divided free graphite. Ordinarily only approximately 20 per cent of the total carbon will appear as free graphite in the steel in this condition, dispersed so finely throughout the steel that no pockets or definitely defined graphitic areas will be noticed.

Has Good Machinability

The high silicon content of the steel renders the carbide phase unstable, allowing the cementite to be broken down into ferrite and free graphite. For most machining operations, graphitic steel is normalized and annealed. This reduces the combined carbon and precipitates part of the total carbon in the form of graphite, uniformly distributed in minute pockets throughout the steel. The pearlite typical of an annealed structure is spheroidized to the degree normally associated with good machining qualities. Fig. 11 illustrates this condition at 100 X; Fig. 12 shows the structure at 1000 X. Experience indicates that this material machines practically as easily as gray cast iron.

Two types of graphitic steel now are being made. That used for water hardening applications is known as "Graph-sil." For oil hardening applications, or where distortion must

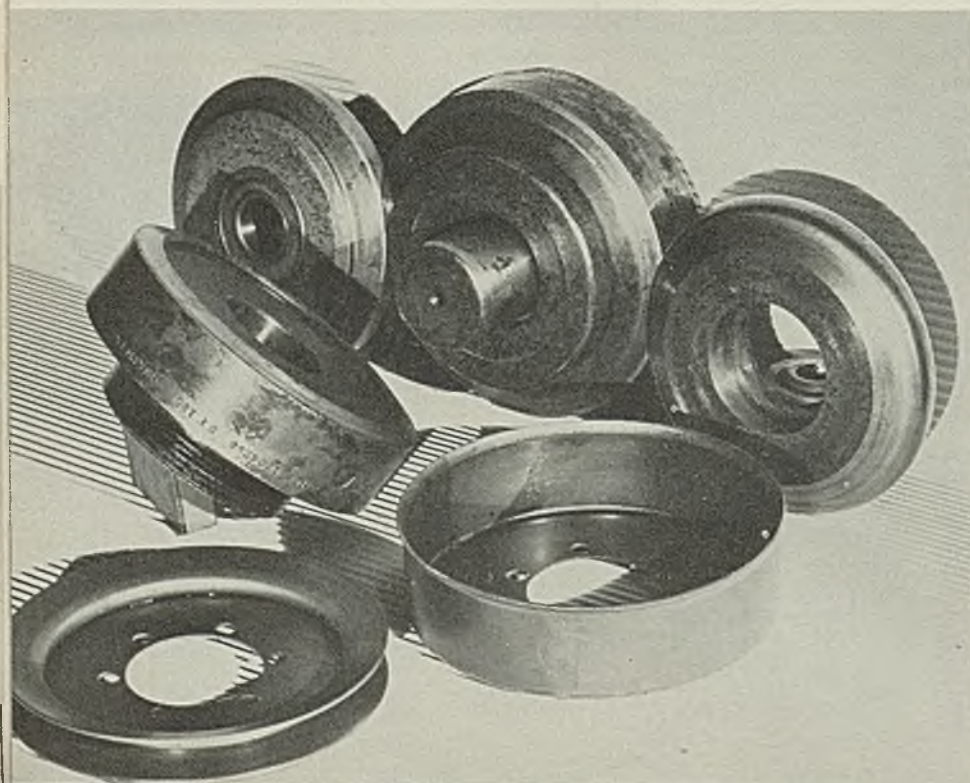


FIG. 2—Shown here are forming machine rolls which are used for shaping strip steel products, also a typical die for spinning fan pulleys

Heat Treatment and Dies and Punches

BY G. A. STUMPF AND F. R. BONTE
Steel & Tube Division, Timken
Roller Bearing Co., Canton, O.

be held to an absolute minimum and where special toughness is required for the service, approximately 0.25 per cent of molybdenum is added to the specification, this steel being called "Graph-mo". Preliminary and final heat treatments depend upon the application for which the steels are to be used.

Annealing Permits Sawing

In processing graphitic steel, care must be exercised to control graphitization, for once the graphitic pockets are established they are permanent unless forged together. The degree of graphitization, however, can be largely controlled by the annealing treatment. Consequently, material which is to be forged to shape is worked from the "as rolled" condition, where a high percentage of combined carbon exists, in which state it can be hot worked satisfactorily if reasonable care is exercised in keeping the temperature of the piece between 1700 and 2000 degrees Fahr. A light annealing treatment must be applied to Graph-mo as it comes from the mill before it can be sawed, but this treatment is controlled carefully to avoid graphitization.

Material for machining, however, should be normalized and annealed to obtain best results. Thus, billets of Graph-sil for forging into dies are shipped in the "as rolled" condition and Graph-mo billets are only

softened enough to permit cold sawing. All stock which is to be machined to shape is shipped only after normalizing and annealing, regardless of whether it has been forged to shape or is still in the bar or billet form.

Graphite particles present in graphitic steel after normalizing or annealing are utilized in the final heat treating and hardening processes. When steel of this type is held at heat above the carbon change point, part of the graphite is absorbed, but the pockets remain the same. Quenching develops a martensitic structure, the material

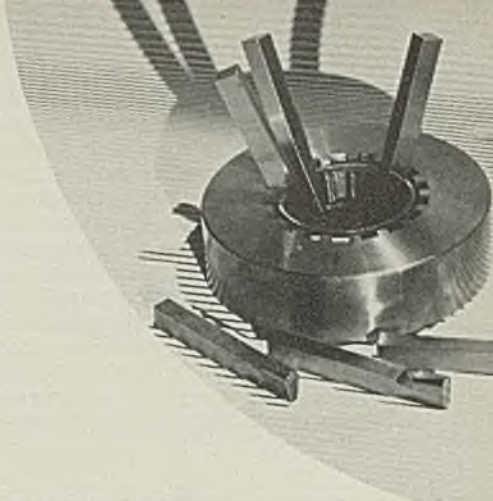


FIG. 4 — Multiple punch and die assembly for coining or "winging" bearing cage pockets to conform to contour of tapered rolls

reacting in much the same manner as does a eutectoid tool steel. This structure is clearly evident in the photomicrograph shown in Fig. 13.

Physical properties of graphitic steels are closely related to the microstructure developed in the material. This in turn depends on the heat treatment, which controls the amount of combined carbon. A typical set of values is presented in the accompanying table.

Although the exact heat treatment depends upon the service to which a die or punch is to be subjected, sufficient experience now is available to justify certain general rules. These of course are subject to modification to meet specific cases, but the following outline for the heat treatment of graphitic steel dies and punches is based on practical ex-

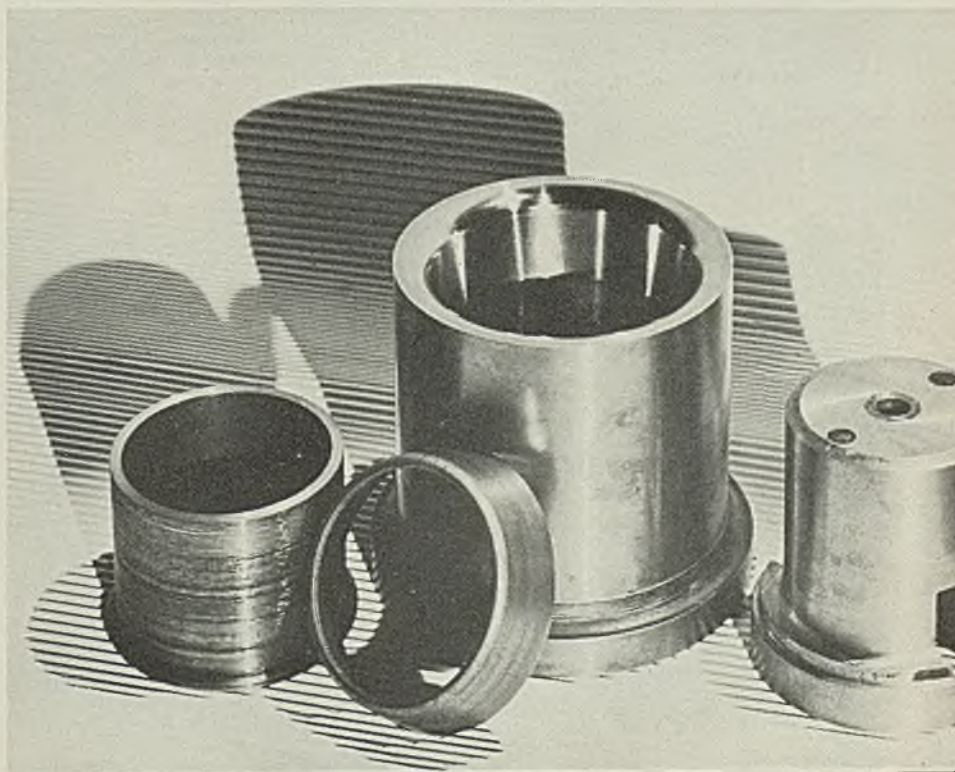


FIG. 3—Made of graphitic steel containing silicon, this die is used for blanking and forming roller bearing cages from hot rolled strip

perience over a considerable period of time and in a number of plants.

As a general rule, blanking and forming dies or punches made from Graph-sil, or water hardening graphitic steel, should be quenched in water or brine from 1550 degrees Fahr. and drawn at 300 degrees Fahr. The blanking punch shown in Fig. 3 is a typical example of the punches made in a wide range of sizes for blanking and forming Timken bearing cages from hot rolled and pickled strip steel. Punches of this na-

ture have been used on material up to $\frac{3}{8}$ -inch thick with uniformly good results. The unit shown was heated to 1550 degrees Fahr., held at heat for 1 hour per inch of section and then quenched in brine maintained at approximately 80 degrees Fahr. It was then drawn at 300 degrees, giving a file hard surface of 63 Rockwell C.

Quenching Performed Carefully

Such a punch should be quenched to a depth just below the first undercut and held in the brine until it reaches a temperature of 300 to 400 degrees Fahr., after which it may be dropped in oil for the final cooling. The length of time such a punch should be held in the quenching bath depends of course upon the section, but any good hardener can gage his quenching time by the rate at which the piece dries when raised out of the brine.

Experience shows that when working with graphitic steel the die or punch should be held at heat for at least 1 hour per inch of section before quenching and that the drawing operation should provide at least 4 hours at heat per inch of section. Time at heat is particularly important in both instances and any attempt to reduce the minimum here stated gives unsatisfactory results.

Internal diameter punches used in

connection with the blanking punch just described should be treated in the same manner except that the hole should be plugged and the punch should be immersed in the brine just past the working surface. Internal diameter dies such as are used for shaping cages, brake drums, etc., also can be quenched in brine from 1550 degrees Fahr., transferred to oil and drawn at 300 degrees, developing a hardness of 62-63 Rockwell C. The larger the section, the more important it is to be sure that ample soaking time at heat is provided.

In innumerable applications for blanking or perforating dies and punches, requirements of long life, sharp edges, wear resistant faces and freedom from chipping and spalling are essential. Likewise, these dies are commonly used in mass production operations and require frequent replacement, which raises the point of machinability, for the unit cost of the die, its life before and after re-dressing and the ease with which it can be touched up are important factors in the cost of the finished piece made from the die.

Many such dies are in use in the Timken bearing factory. These formerly were made from various types of die and tool steel, but since the development of graphitic steel they are all made of this material.

Cracks Can Be Prevented

Ordinarily Graph-sil dies and punches are quenched in water or brine, but in the case of draw rings or blanking dies such as are shown in Fig. 9, it is advisable to quench them in oil where the outside diameter is less than 4 inches, as they are likely to crack if made too hard. Quenching such a ring in oil from 1600 degrees Fahr. and drawing it at 300 degrees for 4 hours per inch of section will develop a hardness of 58-60 Rockwell C. where larger rings are concerned, the greater mass of metal permits such units to be quenched in water from 1550 degrees Fahr., cooled in oil and then drawn at 400 degrees, for a hardness of approximately 60 Rockwell C. Whenever water is used for quenching, care should be exercised not to keep the ring in the tank too long, transferring it to the oil bath for cooling just as soon as the proper quenching action has been secured.

Graph-sil requires some care in quenching, but the tough nonwarping Graph-mo has proved to be easy to handle for dies and punches. The blanking punch shown in Fig. 1, for example, was made from Graph-mo, quenched in circulating oil from 1475 degrees Fahr. and then drawn at 300 degrees. This treat-

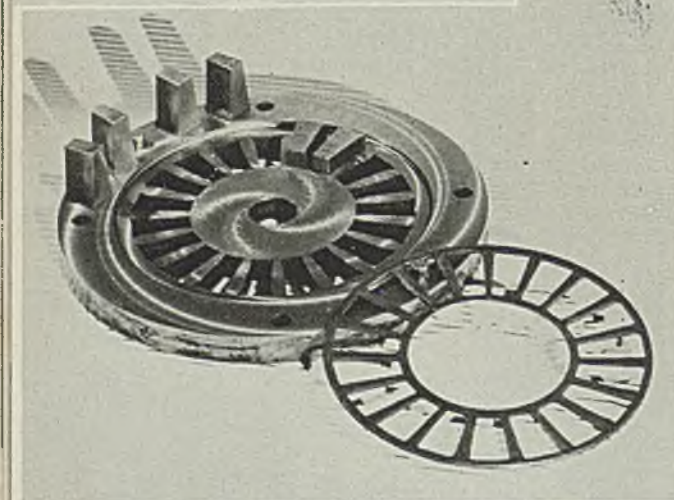
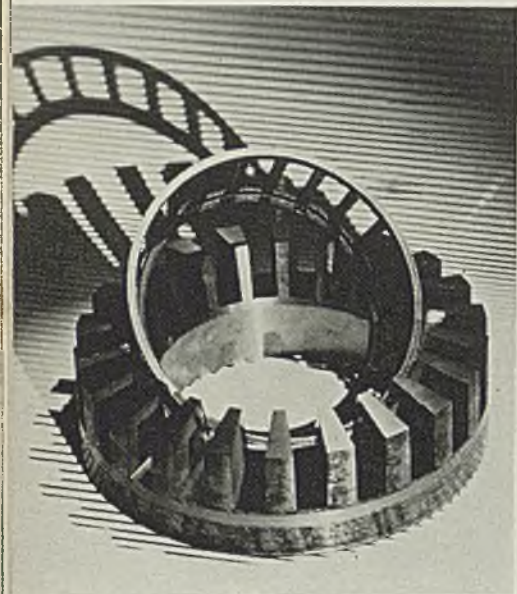
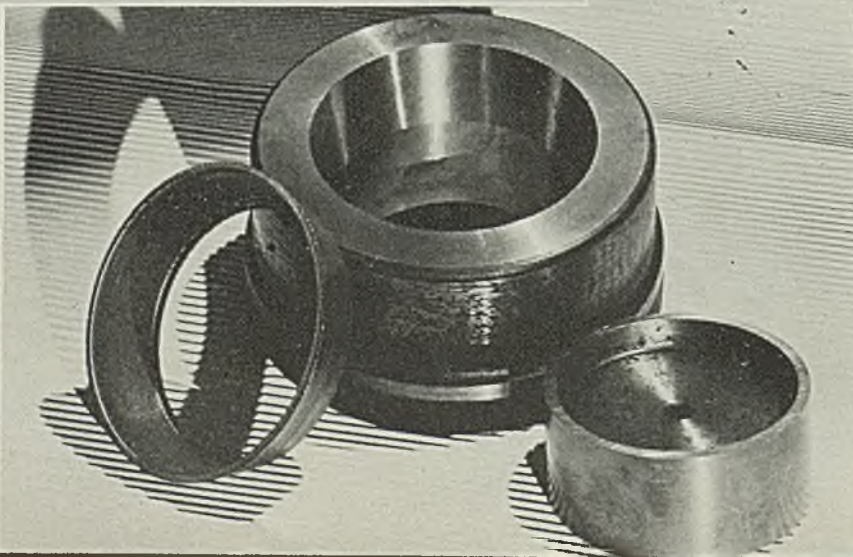


FIG. 5 (top)—Perforating die used for making standard tapered roller bearing cages. **Fig. 6 (center)**—Another perforating die and punches employed in producing cages for flat-type thrust bearings. **Fig. 7 (bottom)**—Sizing dies such as this operate under high pressure, therefore must be hard and tough



ment produced a file hard punch, the working face being 63-64 Rockwell C. With this nonwarping steel it is seldom necessary to use special quenching fixtures, drop quenching being ordinarily all that is needed.

Sizing dies such as the one shown in Fig. 7 operate under high pressure and it is essential that the working surface be exceedingly hard while the body of the die is tough. Consequently, they should be quenched on a fixture, any bolt holes being plugged with asbestos and the sides protected. For small dies best results will be secured by concentrating the flow of coolant through the hole in the die. On large dies it is necessary to quench the whole die under a fountain. In either case, the working surface should be file hard, tests showing that by quenching from 1550 degrees Fahr. into brine and drawing at 300 degrees a hardness of 63 Rockwell C is developed. Soaking and drawing times should be based on the same schedule as previously listed.

Operated at High Speed

Perforating units used in multiple dies at the Timken plant for perforating the pockets in bearing cages are made of Graph-mo. These punches, which are used on strip steel up to 3/16-inch thick, are given constant high speed service. The graphitic steel parts, after having been machined and ground to size and shape are heated to 1475 degrees Fahr., held at heat for 1 hour per inch of section and quenched in circulating oil. Following the quench they are drawn at 700 degrees, holding them at heat for 4 hours per inch of section to assure uniformity of structure throughout. This treatment develops a surface hardness of 52-54 Rockwell C, which, while not file hard, has been found to give the most satisfactory results in service. Fig. 6 shows a die used for perforating the flat cages used in thrust bearings and Fig. 5 shows another perforating die used for making cages for the standard type Timken bearings. The same treatment is used on internal diameter dies.

Multiple punches such as those shown in Fig. 4 are used in the Timken bearing factory for coining or "winging" the edges of cage pockets to conform to the contour of the rolls. As cages are made from strip steel up to 3/16-inch thick, the die wings and punches must be file hard and withstand both heavy pressure and shock, retaining their sharp edges and smooth faces during long production runs. Experience shows that for dies and punches subject to service of this nature the oil hardening Graph-mo gives excellent results when quench-

ed from 1475 degrees Fahr., and drawn at 300 degrees to a hardness of 63-64 Rockwell C. At least 4 hours at heat should be allowed per inch of section in drawing Graph-mo coining dies and punches.

Higher Center Pin Life

The center pins used for operating the multiple perforating or winging (coining) punches do not need to be as hard as the punches, but must be extremely tough and wear resistant, as any inequality on the operating face will affect the coined surface. Many times the former life of center pins has been secured in the Timken plant by using Graph-mo for these parts. High fatigue strength is obtained with good wear resistance by quenching pins of this nature from 1450 degrees Fahr. in oil and drawing them for 4 hours per inch of section at 600 degrees, giving a hardness of 55-57 Rockwell C.

Closure dies such as the one shown in Fig. 8 may be made from either Graph-sil or Graph-mo, depending upon service desired. When Graph-sil is used, heat treatment is the same as that given for sizing dies. If Graph-mo is used, the steel is quenched from 1475 degrees Fahr. and drawn at 300 degrees for 4 hours per inch of section.

Heavy-duty coining punches re-

quire a high drawing temperature, for toughness and freedom from chipping are essential. Graph-sil has been used at the Timken plant for coining 3/8-inch strip (S.A.E. 1015 steel) with most satisfactory results. The largest punch thus far used for this purpose has an outside diameter of 2 1/2 inches. It was held at 1550 degrees Fahr. for 2 hours, quenched in brine at 80 degrees to a depth of 1 1/4 inches, cooled in oil and then drawn at 650 degrees for 8 hours, showing a

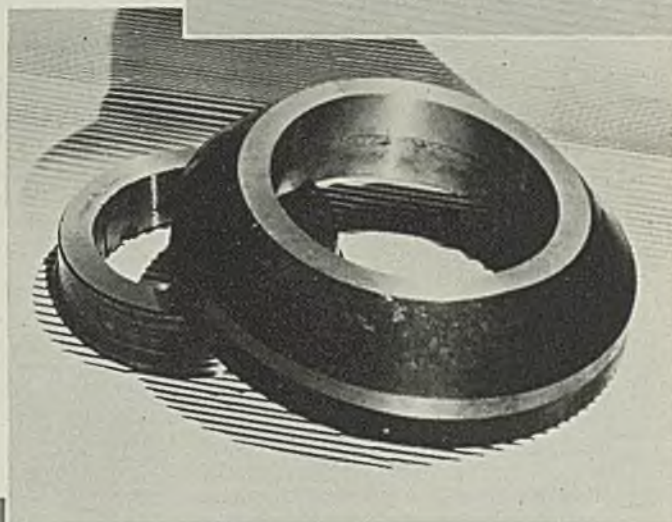
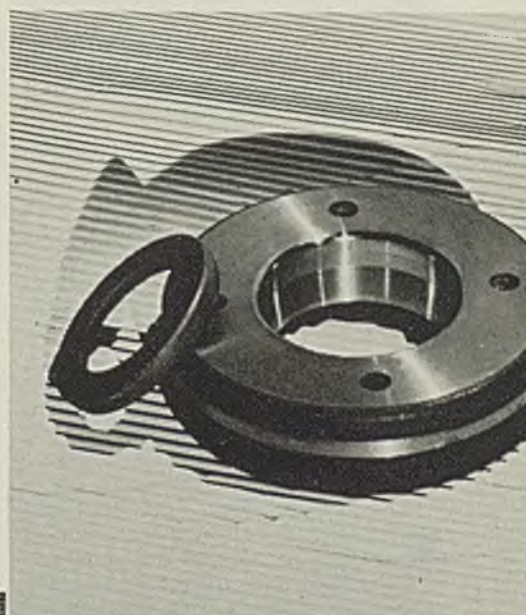
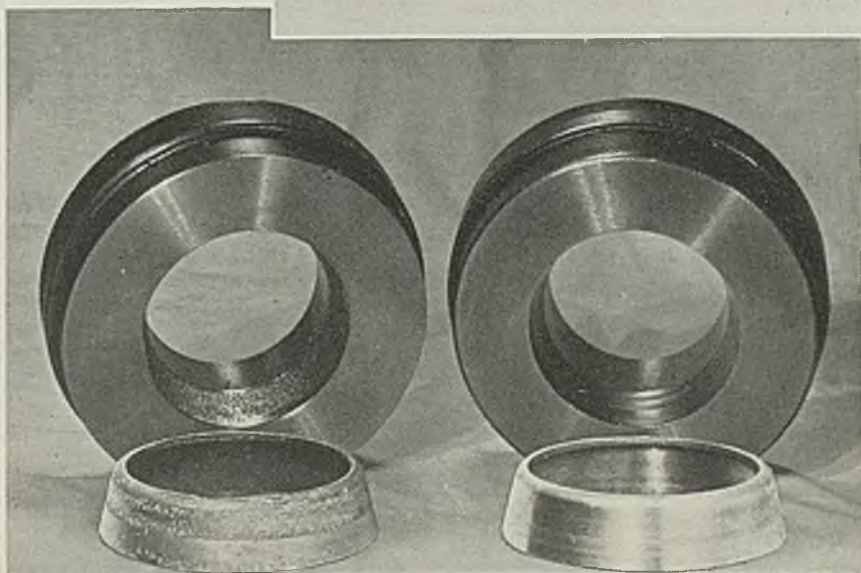


FIG. 8 (top) — A typical small closure die. **Fig. 9 (center)** — Draw ring or blanking die of graphitic steel containing silicon. **Fig. 10 (bottom)** — The graphitic steel cage drawing die at the right made 309,000 pieces; the former die at the left, 10,000 pieces. The product of each die also is shown



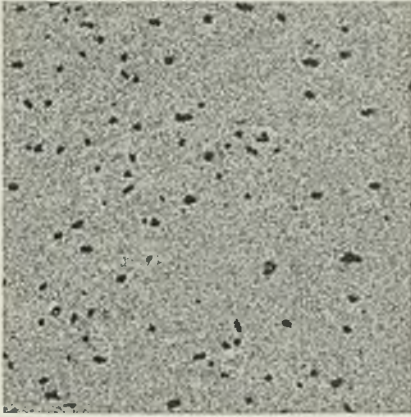


FIG. 11—Microstructure of annealed and normalized Graph-mo in condition for machining. 100X

hardness on the working face of 55 Rockwell C.

Rolls for use on forming machines for shaping bicycle rims, truck wheel rims, moldings, pulleys and other irregular shapes from strip steel have been made successfully from Graph-sil. These rolls should be quenched in brine from 1550 degrees Fahr., transferred to oil for cooling and drawn at 300 degrees, developing a hardness of 63-64 Rockwell C.

Experience which has been obtained to date indicates that rolls of this character, such as are shown in Fig. 2, will last from two to four times as long as rolls formerly used and that they show a remarkable freedom from pick-up.

Suitable for Forming Dies

Forming dies have been made from this same material in a wide range of sizes, the largest to date having been 30 inches in outside diameter. The smooth, wear-resistant surface, free from pick-up or scoring, which features graphitic steel makes it particularly suitable for dies of this class. Successful applications are now on record where such dies have been used for forming both hot and cold rolled strip steel, aluminum, brass, copper and bronze and certain small parts of stainless steel. As graphitic steel responds quite readily to selective quenching, fixtures and plugs may be employed to good advantage in quenching forming dies which are made from it.

Where the hole in the die is under $\frac{3}{4}$ -inch diameter, experience shows that it should be quenched from 1500 degrees Fahr. Larger dies should be quenched from 1550 degrees, all sizes being quenched in brine at approximately 80 degrees and transferred to oil for cooling. Tests show that a hardness of 63 Rockwell C results from such drawing these parts at 300 degrees and service records show remarkably long runs

before these dies need either polishing or regrinding.

A typical die used for spinning fan pulleys out of strip steel also is shown in Fig. 2 together with a sample of the product. Here the die is finish machined, including threading the holes, before hardening, which makes it essential that a non-warping steel be used. The user reports substantial economies in the cost of making dies of this nature and double or treble the life before redressing the faces since he started using Graph-mo. For dies of this character, the heat treatment consists of quenching in circulating oil from 1475 degrees Fahr. and drawing at 300 degrees, allowing a soaking period of at least 4 hours per inch of section. This treatment develops a hardness of 62-64 Rockwell C, as also is the case in the coining dies and punches described.

Cold header dies present many problems to die manufacturers and

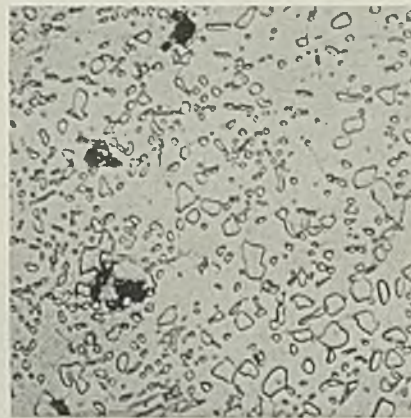


FIG. 12—Microstructure of annealed Graph-mo. 1000X. The steel machines almost as easily as cast iron

users. Graph-sil has been used successfully for making dies for rivets, cold formed from S.A.E. 3120 steel rods, up to $\frac{5}{8}$ -inch diameter. These dies are quenched in water on a fountain from 1450 degrees Fahr., cooled in oil and drawn at 525 degrees to a hardness of 55-57 Rockwell C., being held at that temperature for 4 hours per inch of section. In making dies of this nature, the quenching water should be directed through the hole or into the pocket, the outside of the die being protected when necessary. The hardness developed depends on the drawing temperature, increasing as the drawing temperature is reduced.

File hard faces can be obtained on Graph-sil forming dies and punches such as are used for flaring tube ends by quenching them from 1600 degrees Fahr. in oil and drawing them at 300 degrees.

Twist guide rolls in a continuous

bar mill are subject to severe service combining shock with intermittent high temperature and water sprays. A test installation using Graph-mo rolls already has given several times the life formerly expected and apparently will prove highly satisfactory. The new rolls do not crack, chip or spall and no heat checking has been noticed. The Graph-mo rolls were machined to shape after having received the customary graphitizing treatment of normalizing and annealing and then given a heat treatment consisting of normalizing in air from 1600 degrees Fahr., being held at heat for 1 hour per inch of section. No drawing was done, and a hardness of 280 Brinell was developed on the working face.

Dies Given Severe Test

Graphitic steel was tested first in the Timken plant, being tried out on a cage drawing die, the press operating at 90 strokes per minute. This operation is one of the most severe in the plant and is used for testing any new steel stock. However, the initial run with a Graph-sil die turned out over 200,000 pieces without showing a single scratch, where the longest run that had been made before was 10,000 pieces and then it was necessary to grind off $\frac{1}{32}$ -inch from the inner face of the die to remove scratches. The die shown on the left in Fig. 10 shows what happened to a former die after a run of 10,000 pieces, while the graphitic steel die on the right was free from scratches or scoring after turning out 309,000 pieces. Fig. 10 also shows the differences in appearance of the product from these two dies.

This success led to other applications and today practically every die used in cage manufacture at the Timken plant is made of graphitic steel. Both the water and oil hardening types of this new steel machine easily, records showing that

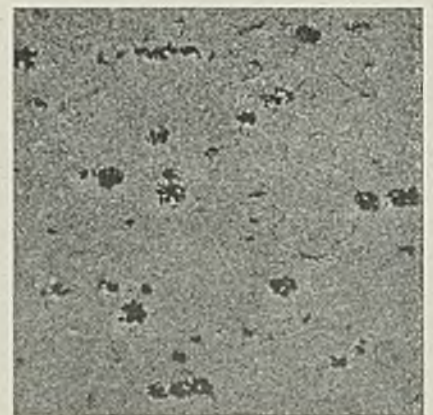


FIG. 13—Microstructure of hardened Graph-sil quenched in water from 1475 degrees Fahr. 100X

machining time for die and punch manufacture is reduced from 30 to 50 per cent as compared to the steels formerly used. This free cutting quality applies to grinding operations as well as to lathe work.

Apparently the long life of graphitic steel dies and punches, as well as the smooth finish and high quality of pieces produced from these dies, is due to the unique lubricating properties of the steel as well as to the fact that the dies and punches can be brought to the proper degree of hardness for the work at hand by simple heat treatments easily handled in any die shop.

Any graphite remaining in the graphitic pockets exposed in finishing a die functions as a natural lubricant of the highest grade. Further, these pockets continue to function as microscopic lubricant retainers, with the result that a graphitic steel die always is well lubricated. This oil retaining quality can be demonstrated easily by spinning an oiled piece of graphitic steel at high speed. Even after several minutes of spinning at 1800 revolutions per minute a graphitic steel bar or die will feel greasy, whereas other steels will be perfectly dry.

Refinishing Is Reduced

This lubricated hardness apparently is responsible for the freedom from scoring, pick-up or galling, which is so noticeable in the case of graphitic steel dies. This in turn enables dies to be kept in service longer before polishing or re-grinding. Experience in the Timken plant has been that polishing is reduced over 50 per cent and that only about 20 per cent as much time is required for re-grinding dies since graphitic steel replaced the other types formerly used.

With increased die life comes decreased overhead, due to the reduction in the number of spare or replacement dies which must be kept in stock. Timken experience has been that the spare die stock for production dies safely can be reduced to 25-30 per cent of the number formerly carried on hand. In the case of small dies, this may not seem to represent a heavy investment. In the case of a single size this may be true, but when that saving is multiplied by the whole range of dies required in a large plant it becomes an important item at the end of the year. A substantial reduction in the cost of die stock is attained, for graphitic steels are comparable in price with ordinary die steels. However, it is the saving in labor and machine time expended on die and punch manufacture that mounts up so rapidly.

Still another important economy has been found since changing die steels in the Timken bearing fac-

Physical Properties of Graphitic Steel

Type	Treatment	Yield Point, pounds per square inch	Ultimate Strength, pounds per square inch	Elongation in 2 inches, per cent	Reduction of Area, per cent	Brinell Hardness
Graph-sil	Annealed	56,000	97,500	25.5	47.5	171
	Normalized from 1600° F. . . .	87,500	163,750	11.5	18.5	302
	Quenched from 1500° F. into water and tempered at 900° F.	158,000	194,000	8.5	18.0	401
	Quenched from 1500° F. into water and tempered at 1100° F.	120,500	142,500	15.5	29.6	285
Graph-mo	Annealed	49,500	84,500	25.0	40.1	197
	Quenched from 1475° F. into oil and tempered at 900° F.	177,000	218,000	8.5	14.0	388
	Quenched from 1475° F. into oil and tempered at 1100° F.	136,000	164,000	13.0	23.0	302

tory. That is in the saving in press production time. Experience shows that a press is down at least 45 minutes on an average whenever a die or punch must be changed for any reason. If the shut-down is due to a change in the production schedule, there is no advantage in one steel over another. However, where schedules permit long runs, as is customary in modern production practice, any shut-down due to die wear or failure is directly chargeable to the die. Consequently, when experience shows that a graphitic ing of approximately 8 hours in production as did a former die, a saving of approximately 8 hours in production time is made. In other words, at least 40,000 more pieces can be produced on a press using a graphitic steel die than can be made on the same press in the same length of time when using another type of die steel.

Production Time Increased

Thus the savings made possible by graphitic steel in production work through reduced die manufacturing costs, reduced stock and overhead, reductions in set-up expense, and increased production due to the increase in available press operating time, are substantial. With these savings also comes the more intangible item of improvement in the finished product, and a decrease in the number spoiled or rejected pieces. In work where appearance is important this is essential, and where a uniform, smooth surface is structurally necessary, as is the case in bearing cages, this factor becomes vital.

Much work still remains to be done in the development and application of graphitic steel and research and experimental work in production operations is being continued. The indications are that a wide range of applications exist where these new steels may prove valuable, but it should not be

thought that every problem in the die industry can be solved by using graphitic steel. Its value in the die field, however, apparently is well established.

A.F.A. Prepares Reprint Of Convention Papers

American Foundrymen's association has published as reprint No. 37-30 the proceedings of the forty-first convention sessions on good housekeeping and safety in foundries and industrial codes and occupational disease legislation. The sessions took place at the convention of the association in Milwaukee, May 3-7.

Aside from general proceedings of two sessions, the reprint contains the following papers: "Foot and Leg Protection in the Foundry," by M. Walter Dundore, production manager, Beloit Iron Works, Beloit, Wis.; "Use of Eye and Respiratory Protection in the Foundry Industry," by John H. Holzbog, personnel manager, Chain Belt Co., Milwaukee; "A Consideration of the Problem of Human Silicosis," by Dr. Norbert Enzer, Milwaukee; "Good Housekeeping in the Foundry," by E. G. Meiter, director industrial hygiene laboratory, Employers Mutual Liability Insurance Co., Wausau, Wis.; "Maintenance of Safeguards in the Foundry," by James Thomson, chief engineer, Continental Roll & Steel Foundry Co., East Chicago, Ind.; "Industrial Codes and Their Application," by James R. Allen, assistant manager, industrial engineering and construction department, International Harvester Co., Chicago; and "Essentials of Occupational Diseases Legislation," by O. E. Mount, secretary, American Steel Foundries, Chicago.

Priced at \$1.50, copies may be obtained from headquarters of the association at 222 West Adams street, Chicago.

Building Precision Into Tractors

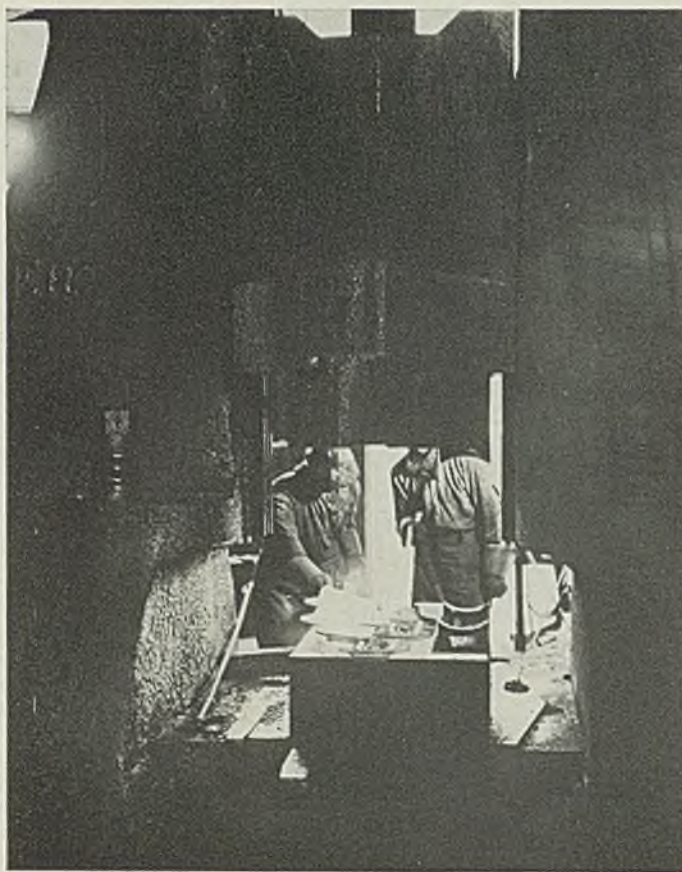
Camera Trip Through Plants of Leading Builder Shows Details of Manufacture and Assembling

GRUELING service demands made upon crawler tractors must be anticipated in their manufacture and in the vast plants of International Harvester Co. "precision manufacture" has become the watchword. Tractor engines must be built to operate continuously at or near full capacity. Tractors themselves must be able to "take" the punishments offered by mud, snow, gravel and difficult terrain. A suggestion of how this is accomplished is presented on this and succeeding pages where the camera takes you into some of the 20 plants operated by International and shows you many of the interesting phases in the manufacture of the company's TracTractors.

Much of the steel for the company's product comes from its own Wisconsin Steel Works at South Chicago, Ill. Succeeding phases of manufacture are at West Pullman, Ill., Chicago, Fort Wayne, Ind., Rock Island, Ill., and Milwaukee. The company recently announced a new \$4,000,000 motor plant to be erected at Indianapolis with a capacity of 700 motors daily for Inter-

national trucks as noted in STEEL of June 7, 1937.

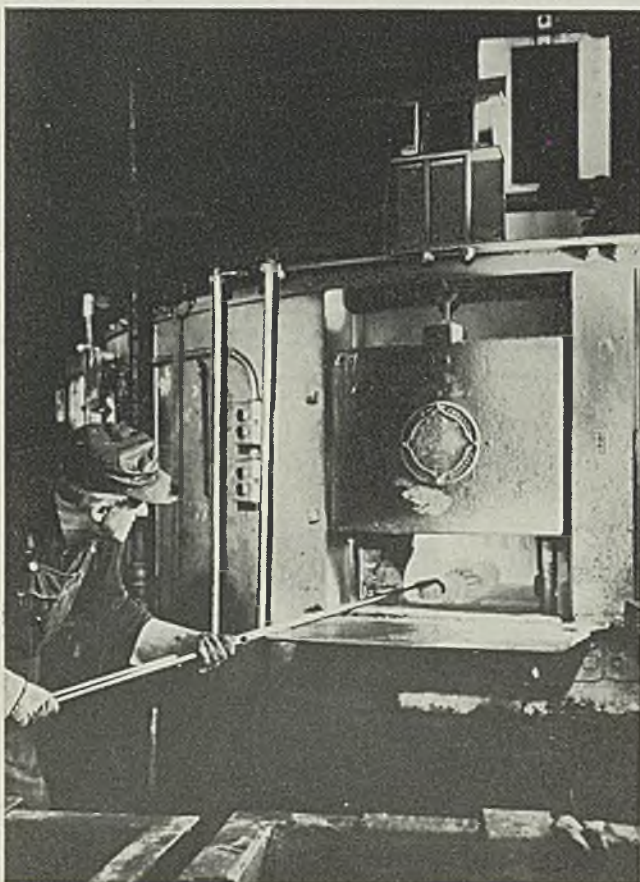
Forging, welding, heat treating, machining, grinding, gear cutting and other incidental operations all are carried out on a broad scale. Equipment is of the most modern type available and in many cases has been designed specially for work on tractor parts. Testing and inspection also play an important part in tractor manufacture, inasmuch as they are essential elements of any precision job.



SAFE working conditions contribute to a quality product. Thus, the hooded figure at the left wears a special helmet into which filtered outdoor air is pumped at a rate of 20 cubic feet per minute as he directs the shotblasting of engine castings. Flexible hose permits playing the stream of shot onto parts of the casting normally difficult of access. The large drop hammer above produces 175 crankshafts daily. Ram, piston and upper die of the hammer weigh 12,000 pounds. Base weighs 60 tons. Note face shield worn by the operator

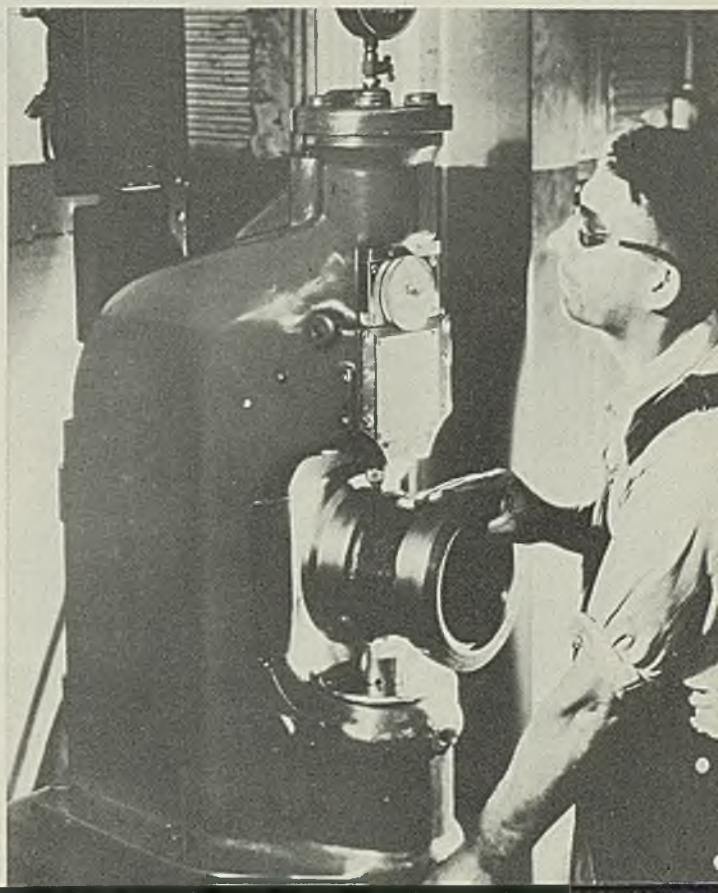


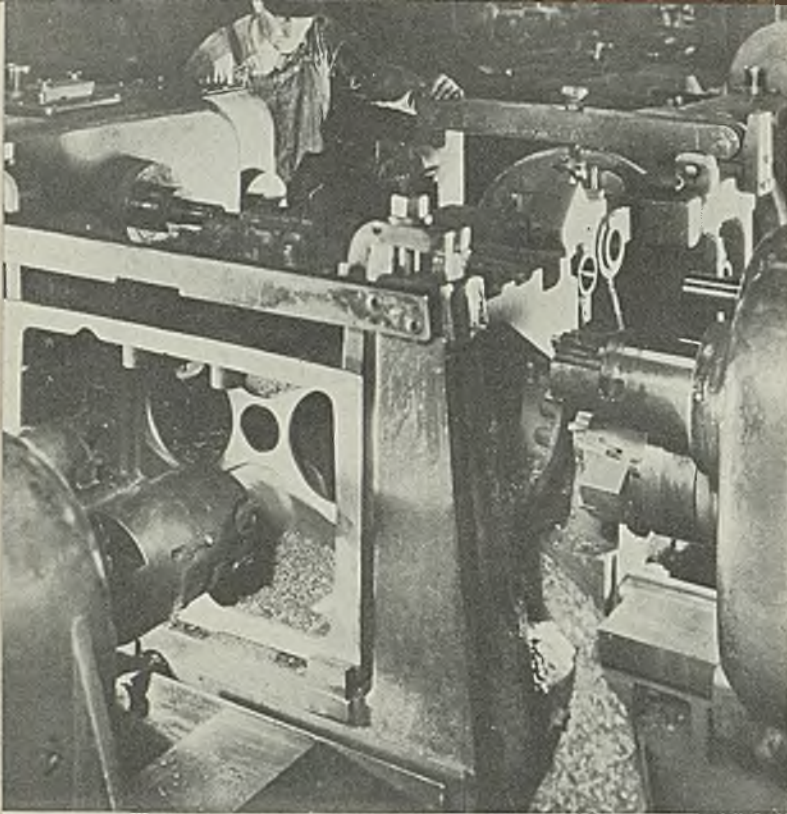
HYDRAULIC full automatic electric flash welders of the type shown at the right are used to assemble a variety of parts, including fuel tanks, straps, fenders, rock shields, steering clutch shafts and levers, brake pedals and rods, engine clutch and steering clutch rods, radiator guards, radiator caps, seat angles, power takeoff levers and the like. The operator actuates a single valve, the machine does the rest



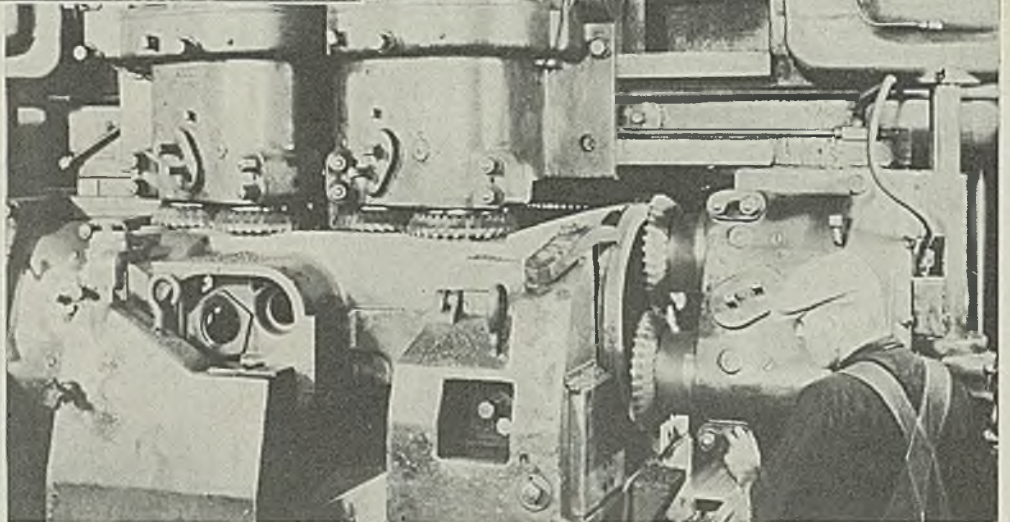
ROTARY electric heat treating furnace is shown at the left, in which pinions and shafts are charged and make one revolution of the hearth before being quenched in tanks in the foreground. Careful control of material analysis and furnace temperatures aids in obtaining the desired physical properties. Engine crankshafts all are heat treated by the new Tocco electric induction hardening process, a separate department being maintained for this work

DIRECT reading and automatically operated brinell hardness tester, at right, with a track roller shell in position for testing, speeds up hardness tests. The operator merely inserts the part, releases a valve controlling the hydraulic pressure and reads the hardness on the dial in front of him

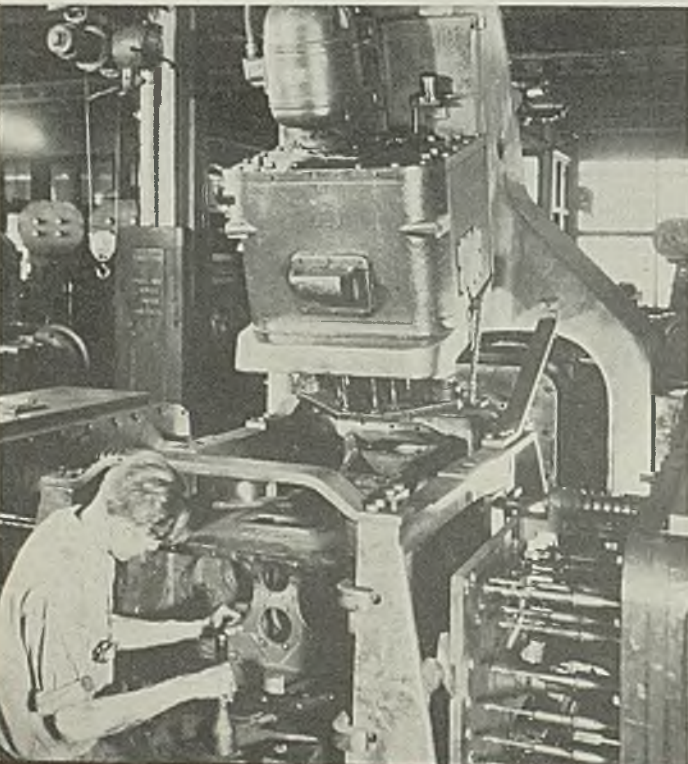




EACH cast steel main frame for a tractor passes through a multiple boring machine like the one at the left twice, once for roughing out the gear centers and other holes and a second time for finishing them. Holes are on two sides of the frame and at the two ends. By boring from four directions at once, considerable time is saved and holes are located accurately

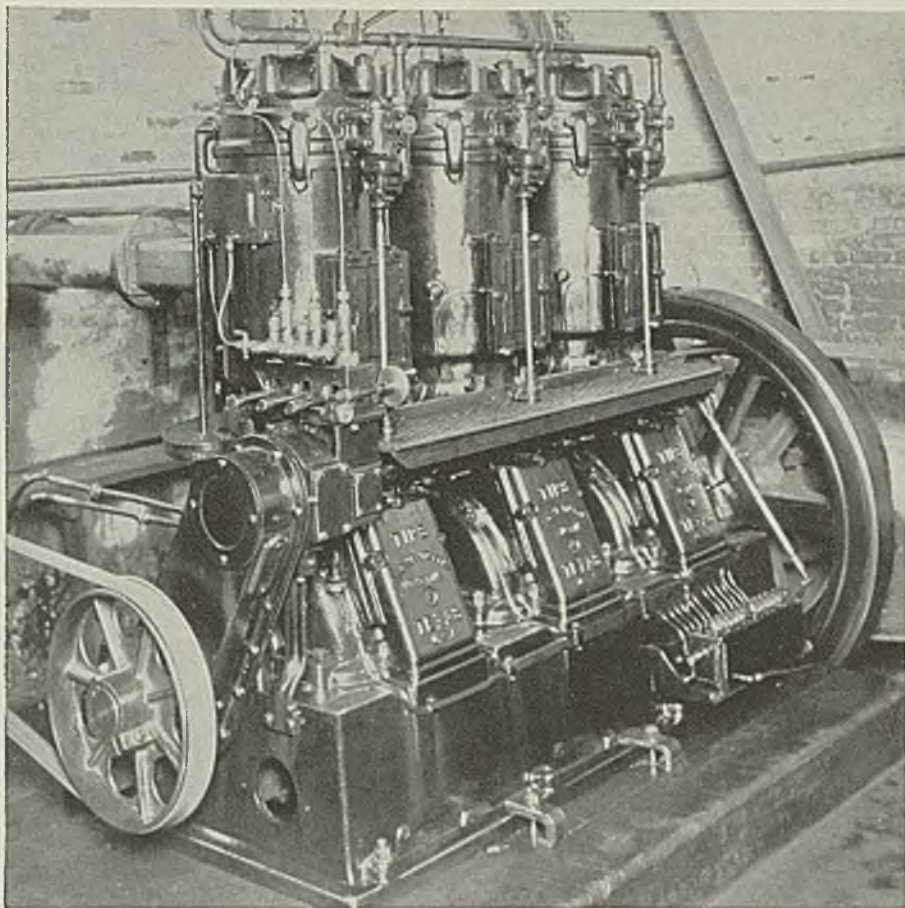


MULTIPLE milling machines, right, are used to mill the top and two ends of the main frame, while other surfaces are milled at one time by another similar machine. These large millers were built specially for this work



DRILLING work on the main frame also is done by a multiple four-way setup, as shown at the left. This unit drills 122 holes at a time—12 on the tapered top, 46 on each of the two sides and 18 on the end. On either side of this large driller are batteries of smaller drilling and tapping machines for specialized jobs. Here again machine tool builders were required to design special units to handle the work

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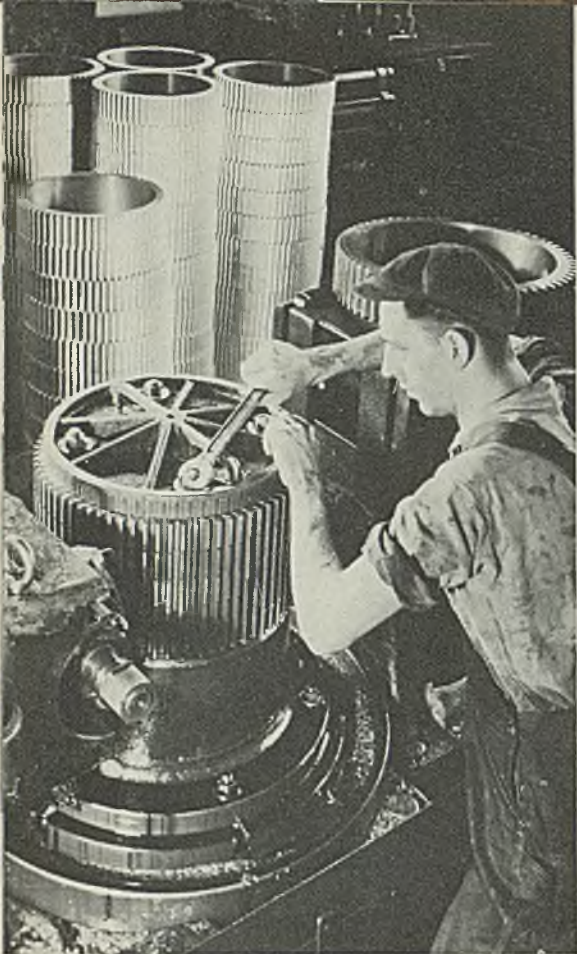
Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories, Bridgeville, Pa.

Vanadium
Steels



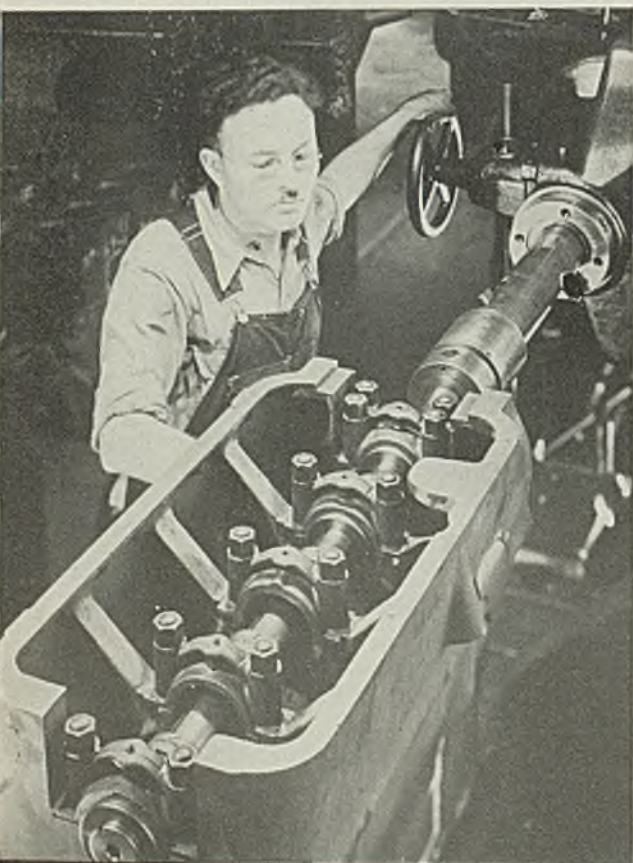
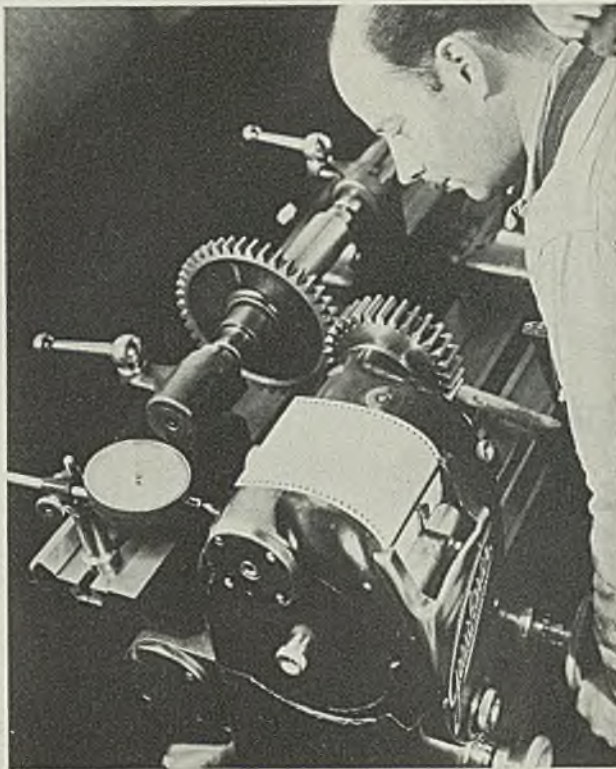
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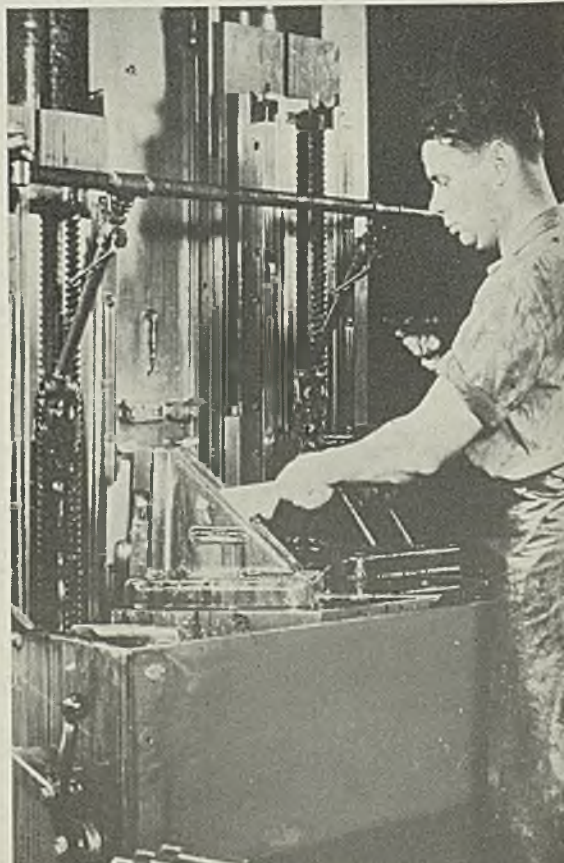


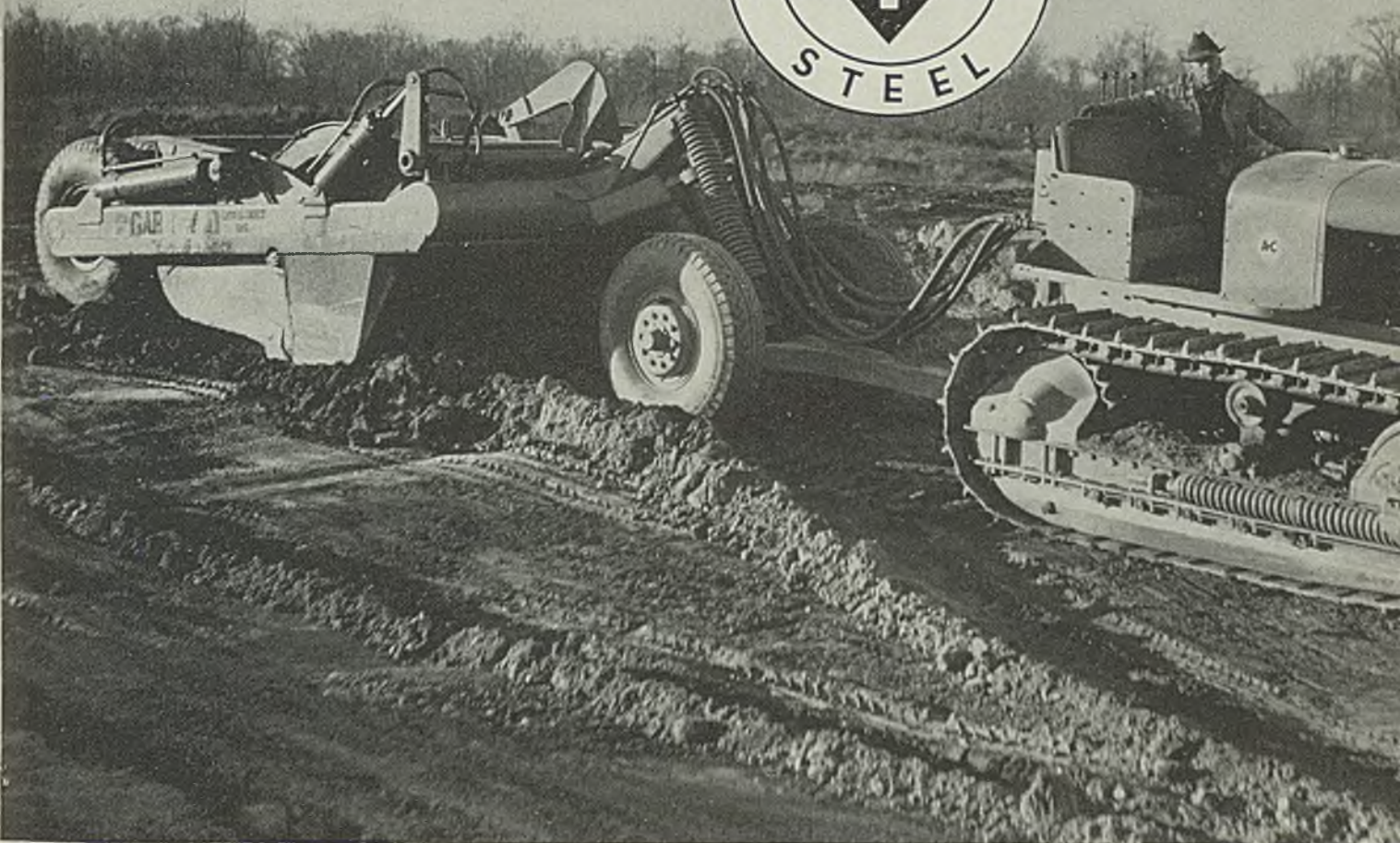
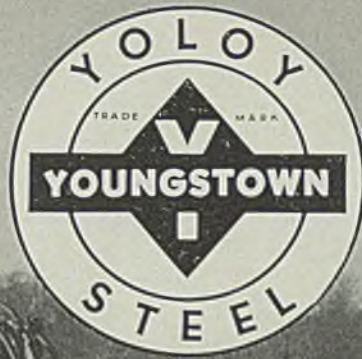
ABOVE is shown a hobbing operation on tractor bull gears. Each gear is wide-faced, forged from the particular alloy steel best suited to its performance, given both a roughing and finishing cut and electrically heat treated

ACCURACY of gear tooth profiles has an important bearing on their easy rolling action and strength. Below a glass-hard master gear in the front of the machine measures the tooth profiles and spaces between the teeth on the gear being tested at the rear. The record is transferred to the moving chart emerging from the machine



CRANKCASE for each five-bearing diesel engine crankshaft is line reamed with the bearing caps in place, as shown at the left. There are 16 blades in each of the five cutters. Note strong ribs supporting the inner bearings. At the right is a vertical hydraulic broach which planes the top and bottom edges of track chain links. While one link is being broached, operator places an unfinished piece in the adjacent fixture





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Youngstown Alloy adds 2 cubic yards to payload of Gar Wood hydraulic scraper, decreases fatigue failures, increases corrosion resistance

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Gar Wood Industries found they could increase the payload of their 10-yard road scraper by two cubic yards of pay dirt, increase strength 10% to 20%, and minimize

corrosion and fatigue — all because of Yoloy's extraordinary strength in light weights.

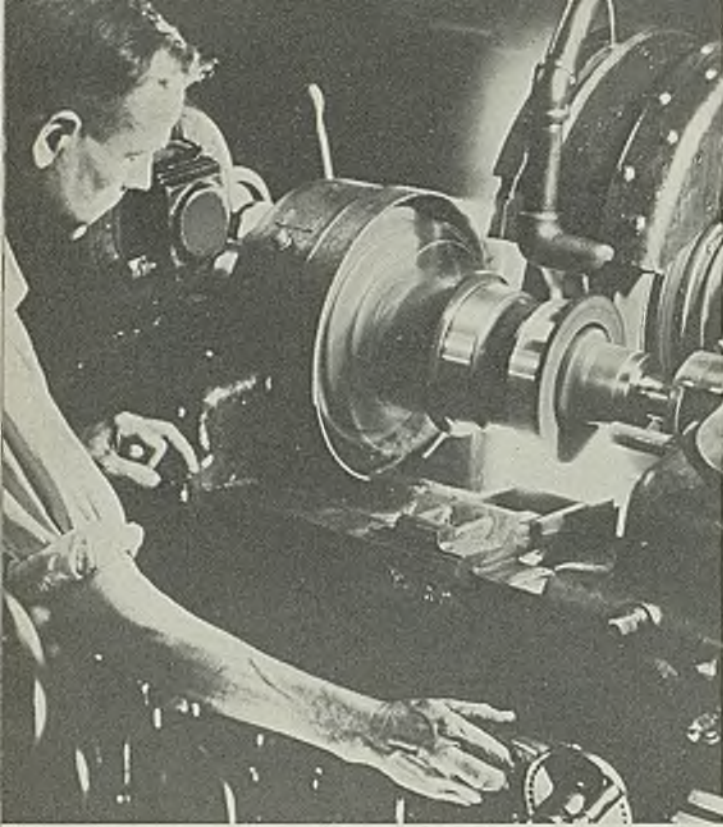
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THE YOUNGSTOWN SHEET AND TUBE COMPANY

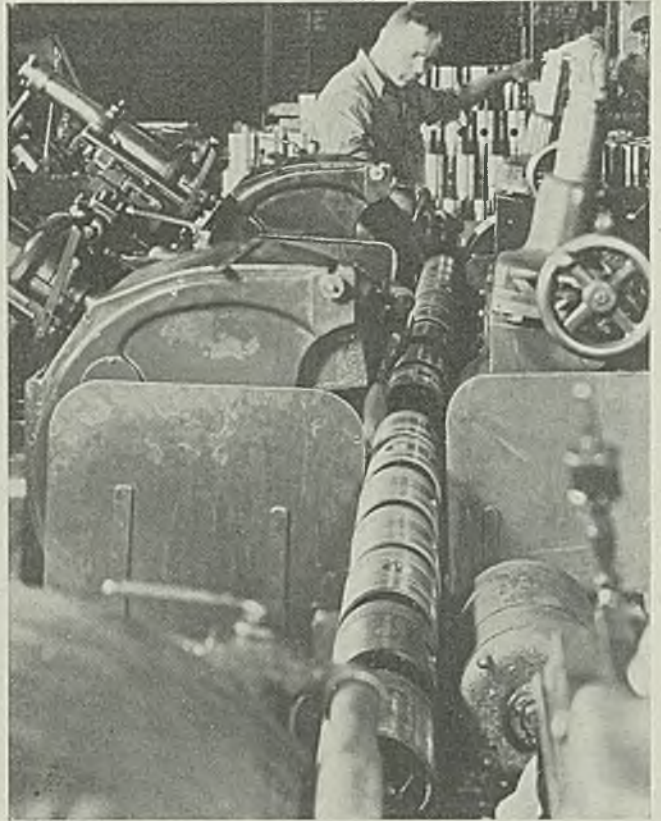
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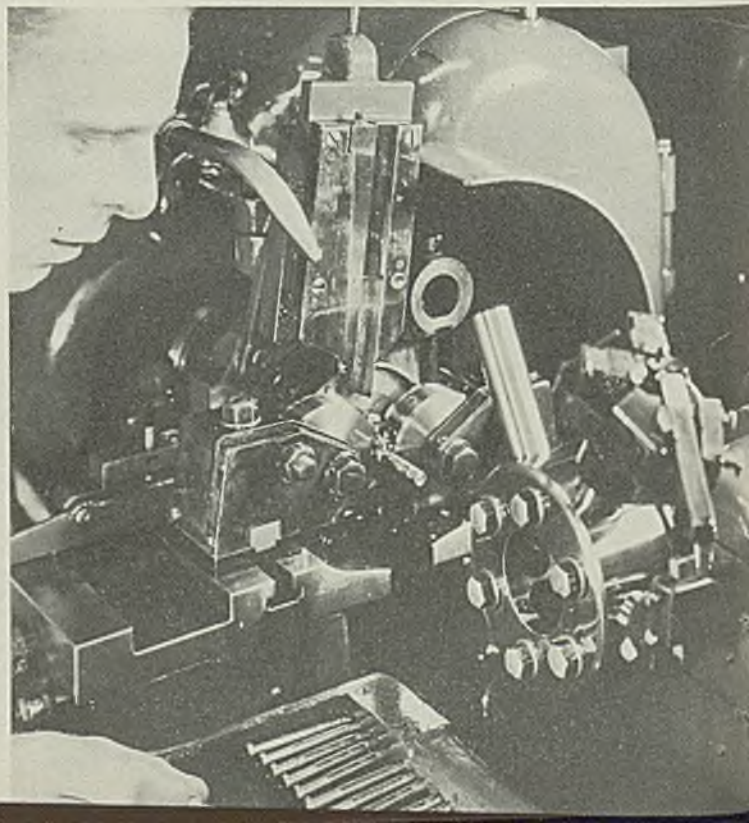
HIGH-CARBON forged steel roller shells are ground on the outside by the unit shown at the left. The shells also are ground on the inside. Below is another grinding operation—automatic centerless grinding of pistons



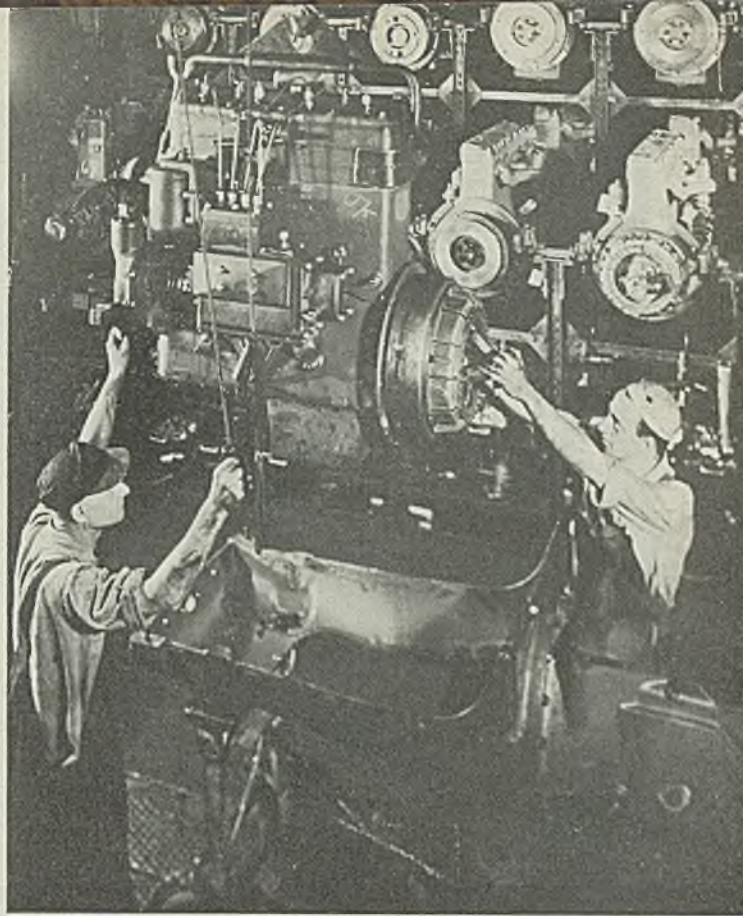
DIESEL pump valves must have accuracy within 0.000025-inch, obtained by careful external lapping on the machine below. Eight valves are lapped at once, with jeweler's rouge used as abrasive. The valves are turned end for end after the initial lapping to insure constant diameter over their entire length



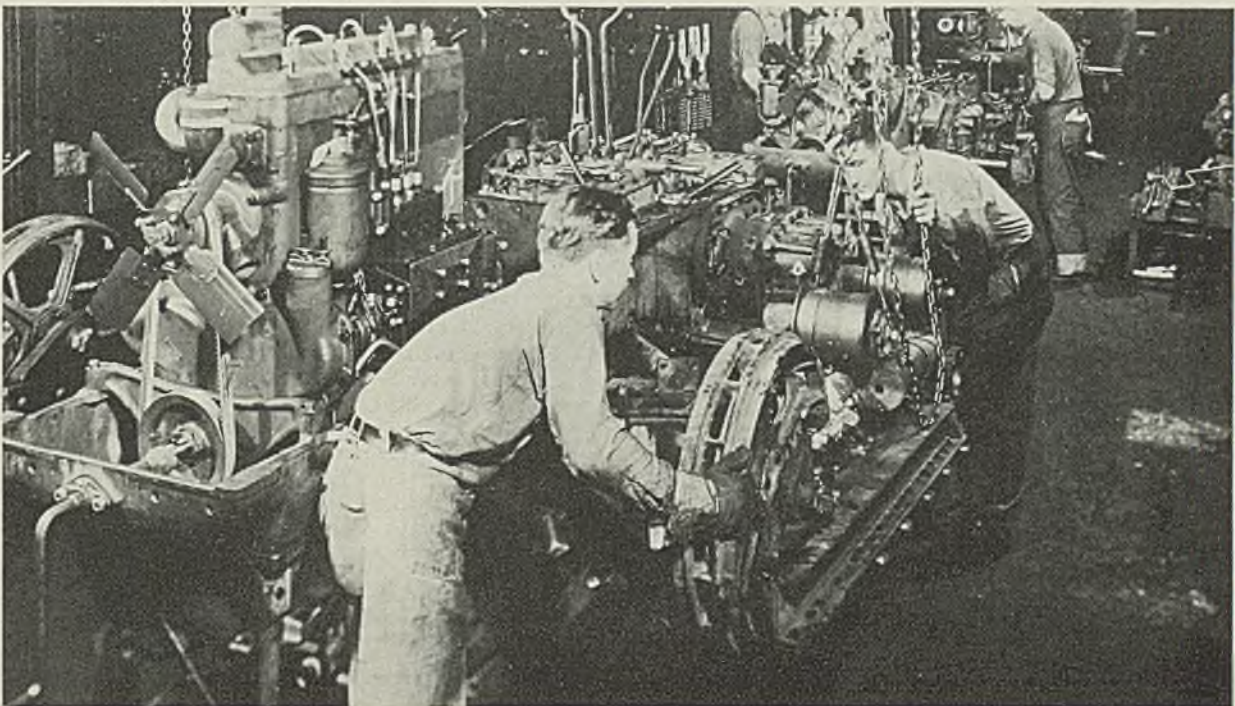
INJECTION pump plungers require 25 separate machining operations, five of which are performed on the automatic machine at the right. In the foreground is a group of "semiformed" plungers which in the finished state require extreme accuracy



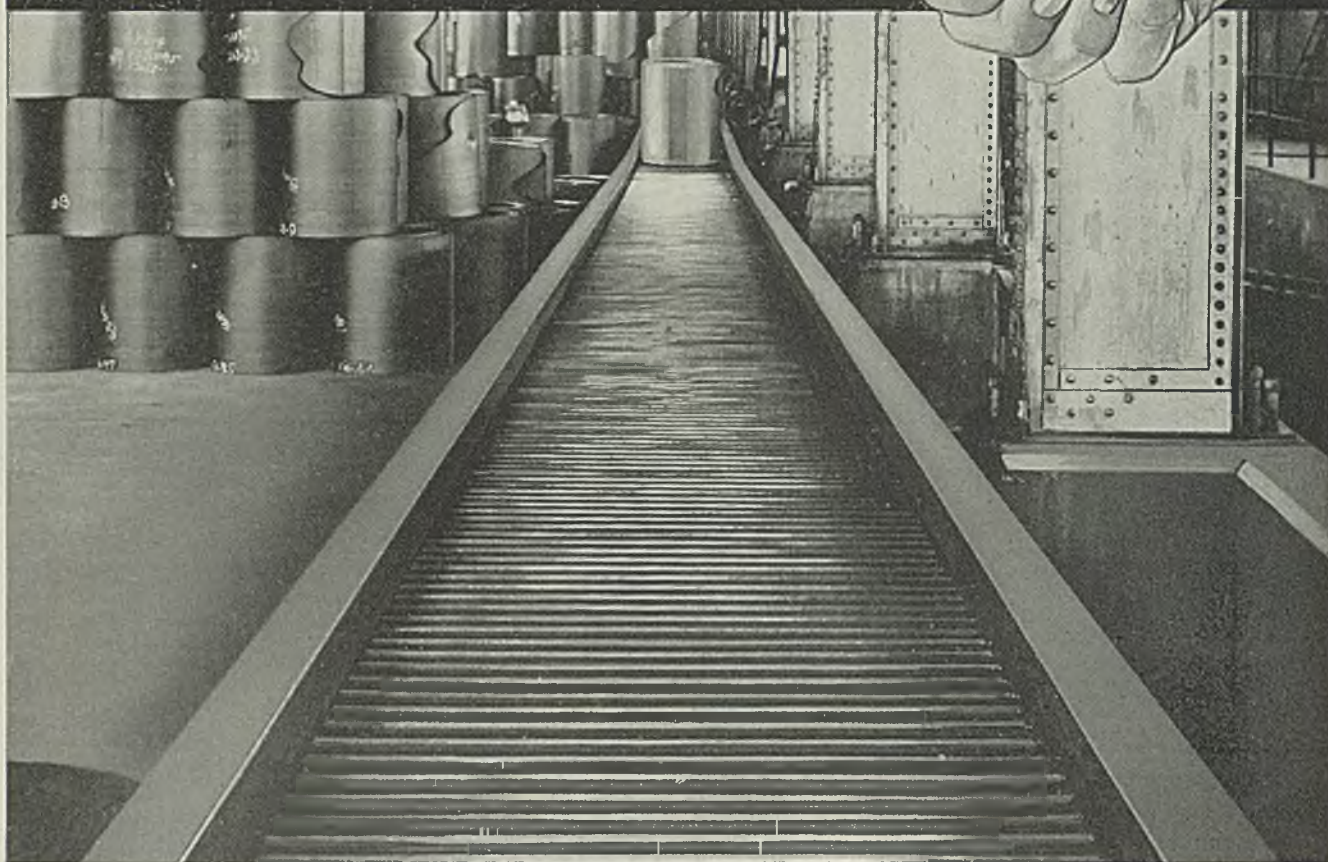
TRACTORS finally come together on the assembly line, after the various component parts have traversed the multitude of manufacturing operations necessary to their final O.K. At the right a diesel engine is being lowered by crane into the main frame of a tractor. In the background are tiers of tested engines ready to be placed in position. Each engine, for the various size tractors, is built in the plant best suited for its manufacture. The engine here was built in the Milwaukee plant. A 6-cylinder engine is built at the Fort Wayne plant; a 4-cylinder engine at the Rock Island plant. All are sent, after testing, to the Chicago tractor works for assembly



BELOW our camera brings you to one of the final steps in assembly before the tractor is ready to go to work. So far as possible, unit assembly is practiced throughout International's plants. Thus, the track driving mechanism is assembled as a unit and mounted on the tractor as shown, simplifying the job of disassembling the mechanism for servicing. Engine, transmission and other basic parts are assembled similarly. One advantage of this system, for example, is that steering clutches and steering brakes can be serviced simply by removing two circular metal plates at the rear of the tractor. A few feet further down the assembly line, track links and shoes are placed in position and the tractor is ready to be rolled away under its own power



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MATERIALS HANDLING



Rearranging of Production Equipment Makes Plant Addition Unnecessary

ELIMINATION of floor handling, an increase of 25 to 30 per cent in output with the same personnel and equipment, and clearing of space for additional equipment in the future, were results achieved by a change made in layout and method of moving work in on overcrowded plant manufacturing plain bearings for the trade. A few years ago, when a new factory manager took over the direction of this plant, construction of a factory addition to provide increased production facilities was under consideration.

Plant additions involve a heavy investment in building and equipment, thereby increasing the tax burden. Under present-day conditions, with the newly imposed tax on retained or invested profits, the penalty on plant additions is made heavier. All this expenditure the bearing company made unnecessary through revision of its method of handling and layout of the machines.

When a plant becomes crowded,

ALARGE midwestern sheet mill recently added this 60-ton capacity, motor-operated lifter to its sheet handling equipment. Built by Cullen-Friestedt Co., Chicago, and to be used in conjunction with the mill's traveling cranes, this lifter is 24 feet 10 inches long and will handle sheets from 26 to 76 inches wide and up to approximately 30 feet long. Sheets to be picked up rest on a rack composed of a series of beams and, because of the rack construction, the lifter legs are notched out so that the carrying lips go down between the rack beams and then close in under the sheet pack. It is believed this is the largest sheet lifter of its type ever built. The illustration at the left shows the lifter in closed position; at the right, the jaws are open to maximum width to receive 76-inch wide sheets

additional space oftentimes is considered as the only way out. However, the crowded condition usually comes about because new machines and equipment are placed in the shop wherever space can be found.

Conditions Need Study

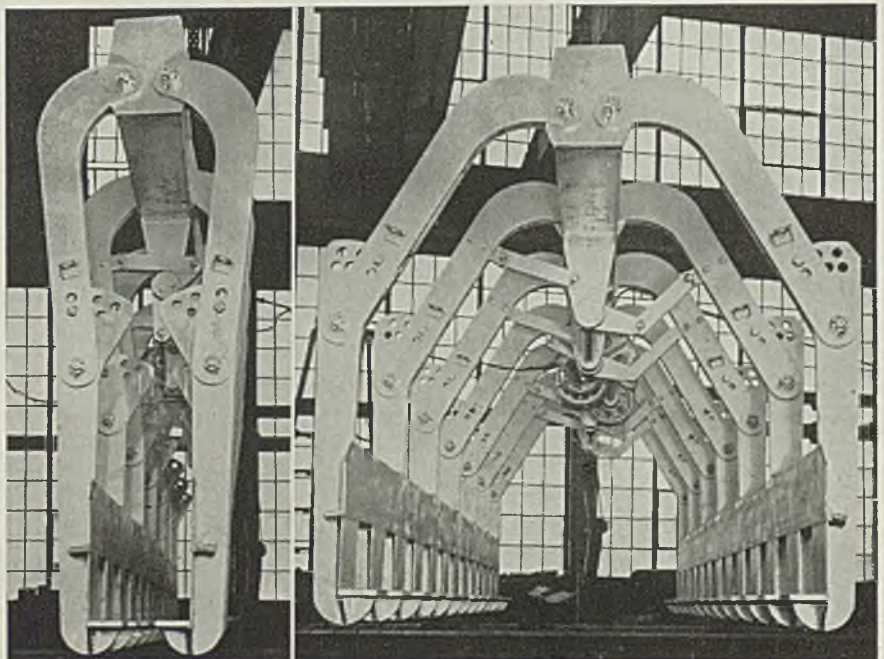
The new manager of the bearing plant held a firm belief that such conditions indicate the need for the whole installation to be analyzed and studied to see whether arrangement and layout can be improved sufficiently to gain space or production advantages which would make a building addition unnecessary. In many cases, this goal can be accomplished, or at least worth-while cost reductions can be obtained, according to this man's experience.

At that time, machines were ar-

ranged in the plant in groups of machines of a type so that the work had to be moved from one machine to the next. This necessitated two work spaces between each two machines to accommodate tables for handling parts in process to and from each machine as well as floor storage space at each unit for unprocessed and processed parts. In addition, the aisle space between rows of machines had to be wide enough for trucking.

The revised layout which was worked out required moving all equipment and rearranging the entire plant except the toolroom and stockroom. In the new layout, which is based on straight-line production flow, the bearing shells are formed in machines set along the side of the shop next to the incoming material stockroom and the parts flow to the cleaning and casting machines as they are formed.

From these units the cast shells are distributed on short roller conveyors to the ends of the different lines of machines, each line working on a particular size or type of



MATERIALS HANDLING



bearing. In one case, a special conveyor is used to carry the bearings up and over an aisle from casting to the production line. These production lines include machines for turning, boring, drilling, hand milling, and other operations.

Only one parts bench or table is placed between consecutive machines. The operator picks up the part at his left, processes it and places it on the table at his right ready for the next operator to pick up, process and pass on down the

line to final inspection and packing at the end of the line. In this way no trucking or aisles are necessary along the lines of machines, and this permitted placing the rows of machines closer together. No material is stored on the floor and every piece or part is in-work from the time it starts down the line until it is completed and inspected. This procedure reduces materially the inventory of work in process.

During the period that shop rear-
(Please turn to Page 65)

parallel lines of short rollers set at a slight grade. On these rollers the stack is moved off the transfer at 90 degrees to the direction in which it was traveling when received.

The illustration at the lower left shows the transfer in the receive position with the two parallel lines of receive conveyor in the "up" position; the illustration at the upper right shows the unit in the discharge position, the receiving rollers having been lowered out of the way.

Returns to Receive Position

Having been discharged from the transfer table, individual sheets are subjected to end and side shearing operations, and are conveyed to a piling unit. With the discharge operation completed, the receive conveyor is raised immediately into place ready to receive the next stack of sheets.

Raising and lowering of the transfer conveyor are accomplished by means of bevel gears and screw shafts placed at each of the four corners of the table. A 15-horsepower motor with speed reducer connection actuates driveshafts and pinions, which in turn operate the bevel gears and screw shafts.

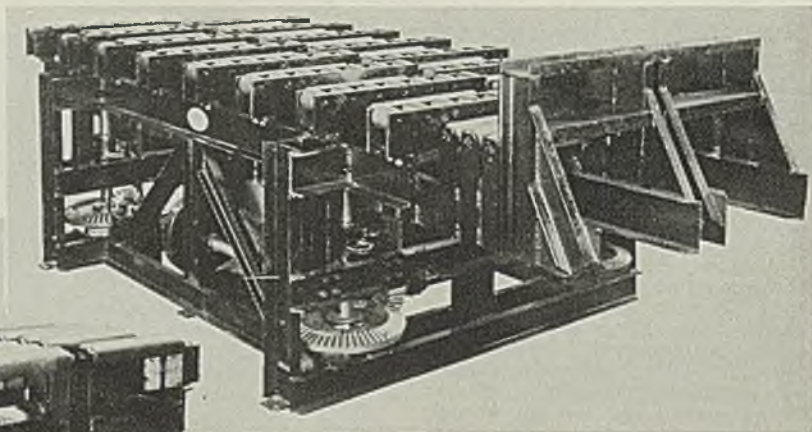
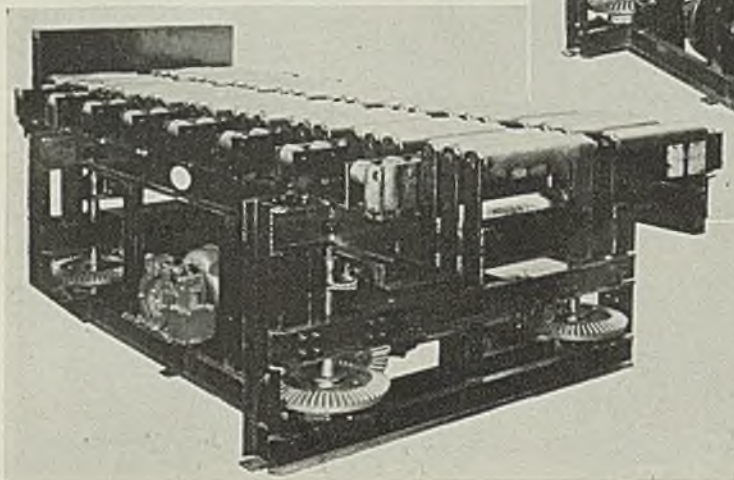
In this device, the receive conveyor, which is the two parallel lines subject to raising and lowering, is "stake-type" roller conveyor, commonly used where sheet packs are loaded or unloaded by overhead cranes. The discharge lines incorporate short rollers mounted in heavy angle frames. The unit is of all-welded construction and heavily built throughout to withstand the severe service to which it will be subjected.

Roller Conveyor Unit Transfers Heavy Stacks of Sheets at Right Angles

ONE of the recent developments in equipment for steel mill handling jobs is a 14-foot long sheet stack transfer conveyor for a southern strip mill. This unit, shown in accompanying illustrations, was designed by Mathews Conveyer Co., Ellwood City, Pa., to receive stacks of sheets and discharge them at right angles onto a processing line conveyor. Stacks weigh approximately 20,000 pounds, with the largest individual sheet 72 inches wide and 13 feet long.

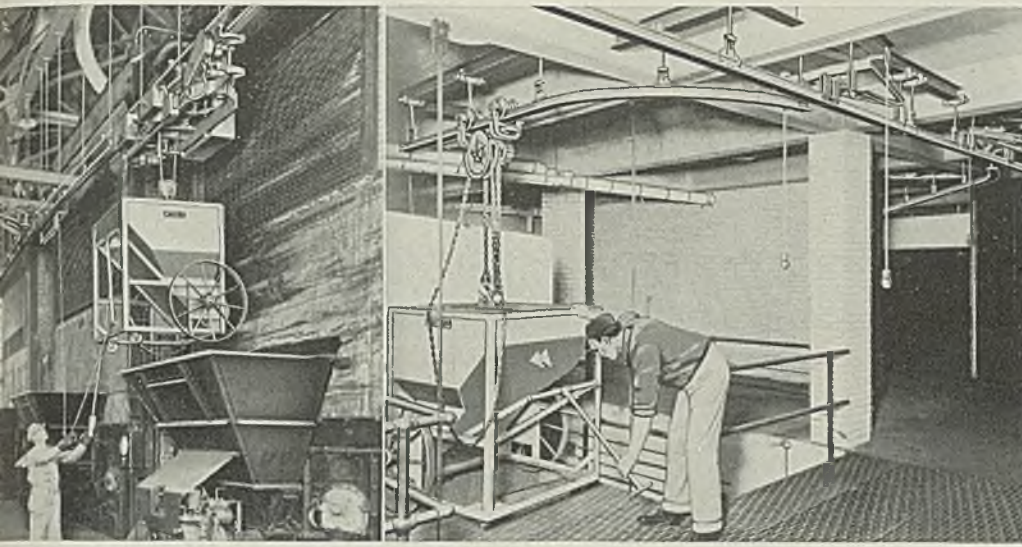
Operation of the mechanism is somewhat unique. A stack is deposited by the overhead crane on a line of heavy-duty roller conveyor

which rolls the stack by gravity onto two parallel roller conveyor lines mounted on the transfer mechanism. When the stack comes to rest against the bumper of the transfer, the unit is placed in operation. The two parallel lines of rollers are lowered a distance of 4½ inches, depositing the stack on eight

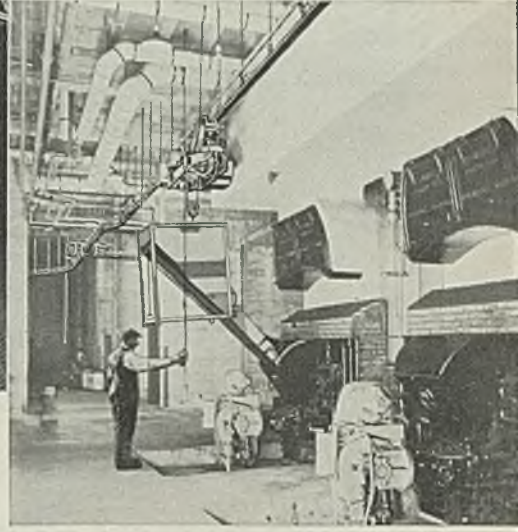


PURPOSE of this recently designed mill equipment is to transfer packs of sheet steel weighing 20,000 pounds from one conveyor to another at right angles. Illustration at the left shows the unit in receive position with the two parallel lines of rollers raised to their maximum height. When these rollers are lowered, as shown in the illustration above, the pack rests on eight parallel lines of rollers ready to be moved sideways. With the pack discharged, receive rollers are again raised

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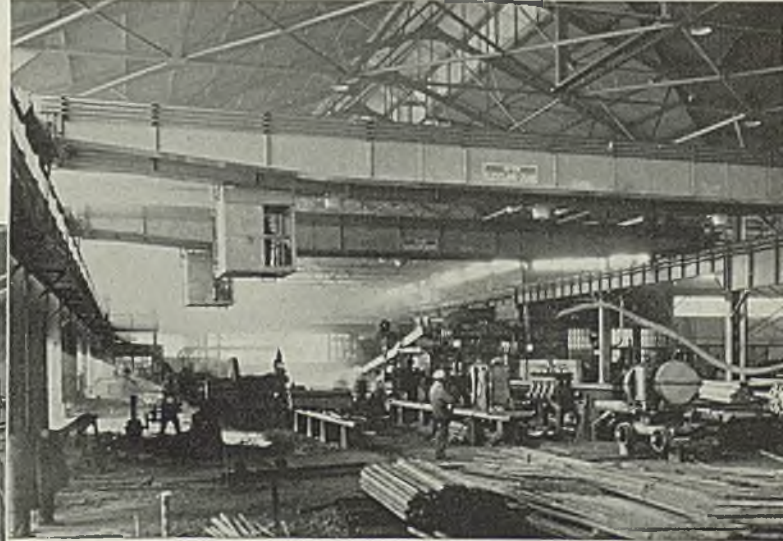
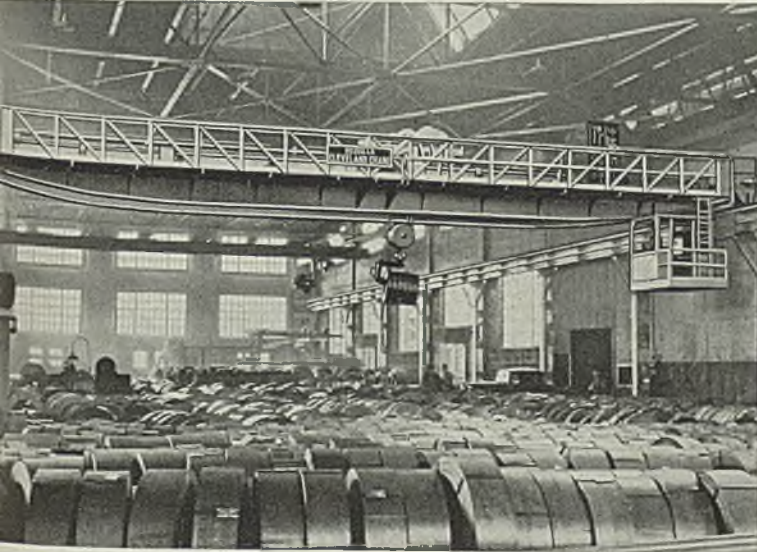
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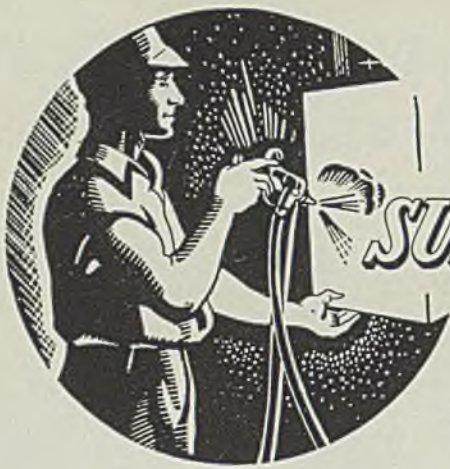
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SURFACE TREATMENT AND FINISHING OF METALS

Maintenance Problems Simplified by Material Applied Directly Over Rust

RUST prevention problems have long vexed maintenance engineers in charge of bridges, electric power transmission towers and other outdoor structural steel installations. While it is theoretically true that steel and iron structures properly primed and painted when installed should remain free from rust during their entire life if thoroughly maintained, it rarely works out in practice.

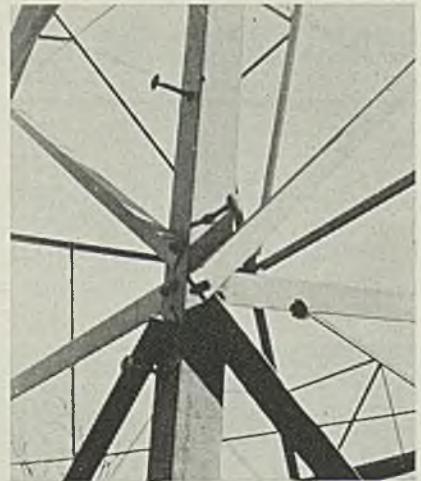
Theoretical conditions cannot be attained in commercial practice and the corrosive combination of moisture and air is always waiting for the slightest opening to begin its attack upon the metal. Newly erected structures even though painted on a dry day almost invariably have minute collections of moisture in crevices, under bolt and rivet heads and other inaccessible places.

In addition rusting will have begun on other surfaces before painting can take place and even though covered with a high grade of paint this rust serves as a basis for further damage.

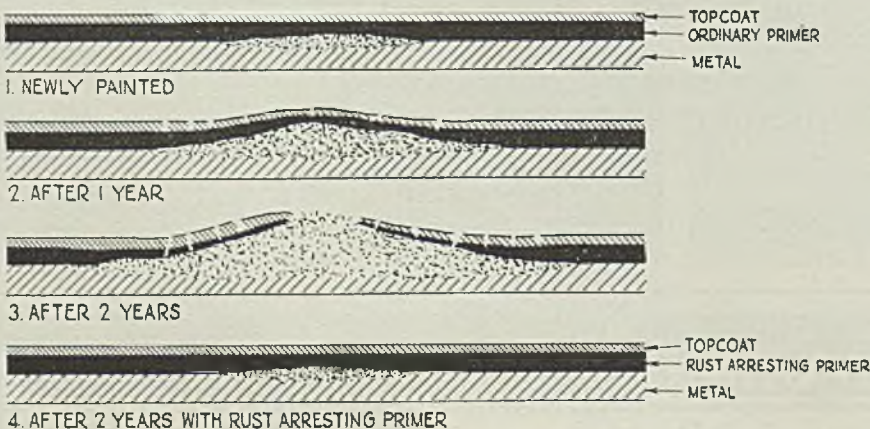
Rust Contains Moisture

Rust is very porous in nature and always contains more or less moisture—as high as 24 per cent at times. Rainfall or dew will saturate a rust coating thoroughly and even strong sunlight will not entirely remove this moisture. It can be readily seen, therefore, that the presence of rust under ordinary conditions is very conducive to the production of more rust.

Ordinary pigmented primers will not penetrate into the cells of the rust, but lie on the surface and seal in the absorbed moisture and air.



DANGER point in structural steel towers lies in the joints shown here. Liberal application of rust arresting compound at joints followed by overall coat of aluminum in rust arresting vehicle was selected by maintenance engineers as method of defense against rust



FIRST three diagrams shown here illustrate the progression of rust sealed under ordinary primer and paint. Paint film is destroyed through no fault of its own but is bulged out because it can not prevent attack from behind. At 4 is illustrated how rust arresting primer prevents rust spots from expanding and exposing metal to corrosion by breaking through the paint film

Standard primers and paints are intended to protect the metals to which they are applied by preventing air and moisture from reaching the metal surface from without. They can do nothing to prevent the action of these elements when they are already inside. More rust is formed under the paint and since rust occupies a greater volume than the original metal it bulges the paint causing fine cracks which permit the entrance of more air and moisture. Even if the air sealed in the rust were not sufficient to cause more rusting, the heat of the sun is sufficient to vaporize the moisture and create sufficient pressure to bulge the paint.

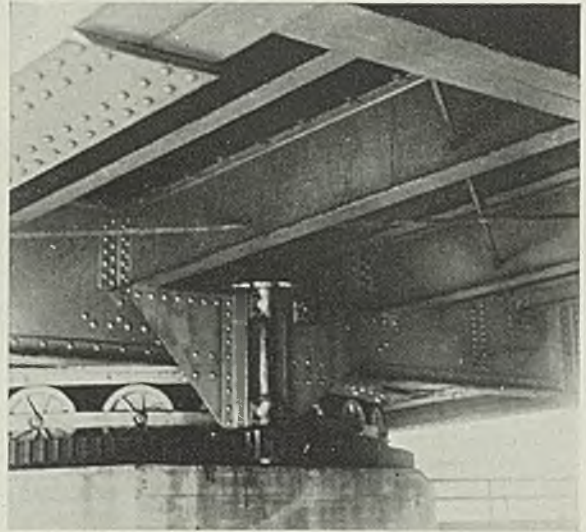
Rust Removal Is Costly

Because of these facts, maintenance engineers invariably specify that rust be chipped and wire-brushed thoroughly before painting. Complete rust removal is frequently impossible and inaccessible places are usually insufficiently cleaned. In any event, areas under bolt heads and similar places cannot be cleaned except at exorbitant cost.

With all these difficulties in mind International Rustproof Corp., Cleveland, set about to find a practical means of combatting rust. The result of their research is a rust arresting compound known as Rust-arest, which involves a new principle in corrosion protection. This compound is a translucent, amber colored liquid which penetrates rapidly and completely into the rust coatings of iron and steel. It is said to render rust chemically inert and definitely prevent further rusting. The coating is applied by brush or spray like any paint and allowed to dry for at least 24 hours. The surface is then ready for painting.

This compound has a certain tolerance for water and in penetrating to the bottom of a rust coating, is

ROLLER bearing pivot of a swing bridge located within 100 yards of a salt works. In 1933 this bridge was so badly rusted it was on the verge of being condemned since removal of the rust was obviously impossible. In May, 1933 it was treated with clear rust arresting compound followed by aluminum paint in a rust arresting vehicle. This photograph taken April, 1936 shows no indication of breakdown. Only surface preparation was wire brushing



said to absorb all moisture which is then evaporated from the surface of the film. All air is expelled and the entire porous portion of both the rust coating and base metal are filled with the compound thus binding the rust particles together and converting them into the pigment of a dense, nonporous coating.

Moisture Expelled from Rust

By expelling the moisture and air in the manner described this compound prevents the formation of further rust by the process outlined above. The compound is said to remain elastic and resist repeated contraction and expansion due to temperature changes.

The compound may be applied over old paint, rusted steel or fresh steel surfaces. The only preparation required is a wire brushing

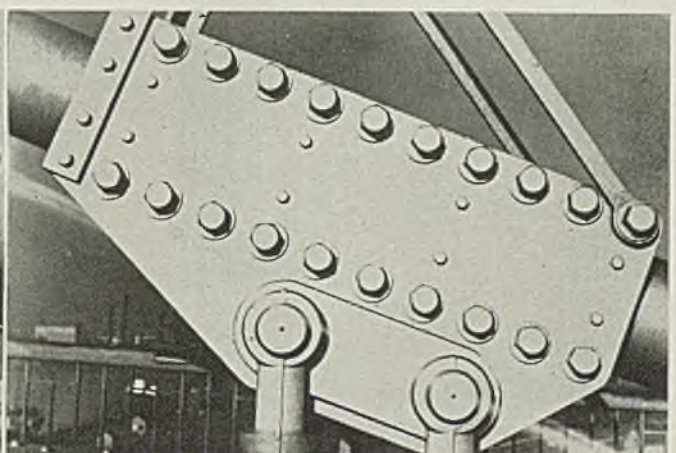
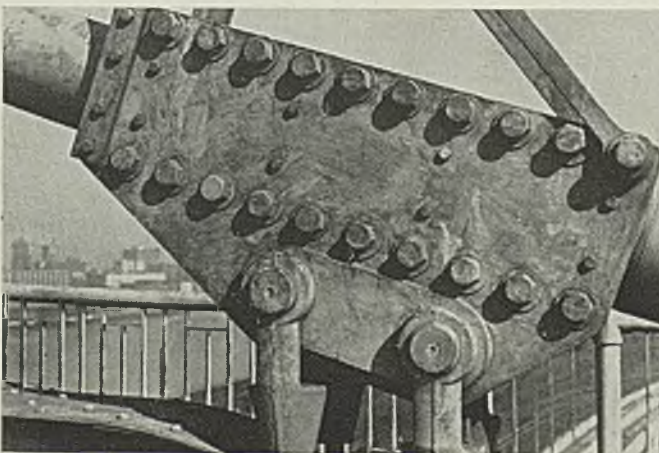
ILLUSTRATED here is a structural unit of the Anthony Wayne high level bridge, Toledo, O., before and after it was treated with a clear rust arresting compound followed by a modified compound containing aluminum paste. The final appearance was so smooth it gave the photograph the appearance of having been retouched, which it was not

to break old paint blisters and remove loose scale. In addition to its rust arresting qualities this treatment is said to renew the life and elasticity of old paint. The compound is not intended to be a paint. Its purpose is to render the rusted surface passive and act as a primer so that when the finish coat of paint is applied it will not be attacked from beneath. It is said that most paint failures are due to "attack from the rear" by moisture and chemicals which were on the surface of the metal before the paint was applied.

Hidden Rust Spots Detected

An unusual feature of this compound when it is applied over old paint lies in its detection of hidden rust spots. When the compound is applied over apparently sound paint it is sometimes found that blisters will form in many places. Under each of these blisters will be found a rust pocket which has not yet progressed to the stage where it has broken through the paint film. The advantage of thus detecting these hidden defects

(Please turn to Page 66)





WELDING, ETC.

BY ROBERT E. KINKEAD

Welded Rails Are Problem For Steam Railroads

BOTH thermit and electric welding are used for welding rails end to end. Experiments indicate that the continuous welded rails up to lengths of several thousand feet are capable of standing up in service.

The desirability of the continuous rail from the point of view of reducing the shock on rolling stock from the joints is obvious to the casual observer who will watch a loaded freight train roll over even well maintained track. But the problem from the railroad point of view is not so simple as it would appear to the welders.

The Pennsylvania main line between Pittsburgh and Philadelphia offers a fair opportunity to study the operation of a railroad under

IN this column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

modern conditions. On four to six tracks trains are operated at night under certain conditions on 5 to 10 minutes headway.

Wrecks are bound to occur and the delays must be reduced to the shortest possible time. Broken and twisted rail must be cleared and new track laid in a matter of minutes. Perishable freight cannot wait.

Bolted rails up to 60 feet can be laid quickly. Welded rails 2000 feet long would be more difficult to handle under such emergency

conditions since both of the processes involve enough slack in one end of the two joined to push up the weld. So far as the emergency is concerned, the broken ends could be drilled and bolted but the repair would be temporary and the track crew would have to come back later and make a weld or install an expansion joint.

Welded rails are definitely in the picture of modern track maintenance for steam railroads; the fact that there are difficult problems to be solved before the practice can become universal merely indicates that the subject is being given such serious consideration that the problems have become evident.

The railroads are willing to solve the problems to get the great reduction in cost of maintaining rolling stock which welded rails will bring about.

Salvage Welding In Machine Shops

HIGH production schedules in machine shops at present are increasing the amount of salvage welding due to errors of machinists.

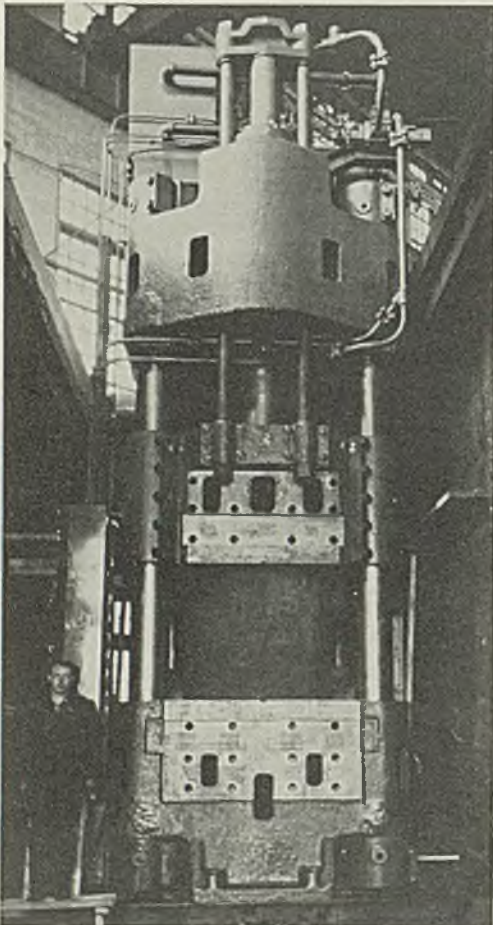
In many cases a shaft or part, if machined undersize either through an error on the drawing or an error of the machinist, appears promptly in the welding shop to be "built up."

Where the job is low carbon steel (0.25 carbon or under), the welding may be done without subsequent heat treatment. In this case the job may be turned down an $\frac{1}{8}$ -inch undersize as required by the correct drawing and two or more layers of weld metal applied so that the cutting tool never cuts in the first layer.

Where alloy steels having air hardening properties are involved, it is usually advisable to give the job a complete heat treatment involving recrystallization after the welding operation is completed.

The temptation is, in many cases, irresistible to work on alloy steels where great salvage value can be made in terms of both material and labor in the machine shop by eliminating the heat treatment. Since heat treatment necessitates complete re-machining it is easy to understand why many shop executives are inclined to look the other way while such salvage operations are carried out.

However, failure to heat treat alloy steels, which have been salvaged by welding, means storing up trouble in the form of minute cracks which will result in service failures later on.



Heavy Press for Light Parts

BLANKING and forming aircraft parts from duralumin, one of industry's lightest materials, is the job of this 175-ton press. Built by the Farrel-Birmingham Co., Ansonia, Conn., it is now installed in the plant of the Lockheed Aircraft Corp., Burbank, Calif. The press will exert a maximum pressure of 2000 tons under a hydraulic pressure of 2300 pounds per square inch

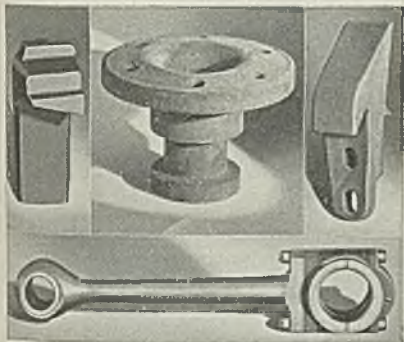
DEAD WEIGHT... CUMBERSOME BULK

INFORMATION for TECHNICAL MEN AND ENGINEERS

The Fruehauf king pin shown below has a minimum diameter of 2" and a 3/4" bore... a net sectional area of 2.7 sq. inches, and is capable of withstanding a direct pull of 115 tons. This is another dramatic example of the inherent strength of forged parts.

Its material is SAE 1035 steel, drop forged and heat treated, having an ultimate strength, in tension, of 110,000 lbs. and 85,000 lbs. (per sq. in.) in shear. It is heated to a Brinell hardness of slightly under 300.

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PROGRESS IN STEELMAKING

Ingot and Charging Cars Are of All-Welded Steel

INGOT and charging cars now are being made by the International Clay Machinery Co., Dayton, O., of all welded steel construction. Two types of charging cars so designed and built are shown in the accompanying illustrations. That shown in Figs. 1 and 2 is equipped with Hyatt roller bearings while that shown in Fig. 3 has MCB bearings.

Advent of high amperage welders and heavier diameter slag shielded welding wire, says the company, allows the welding of the heavy plate sections required in ingot and charging cars. Plates used in these cars range from $\frac{3}{4}$ -inch to 2 inches thick.

In light load charging cars the company intersperses heavy structural shapes with plate construction but heavy ingot cars require complete plate construction. On light charging cars the cost of all welded and cast steel body cars are found to be quite close. As the weight of the cars increases the tendency is for the all welded car to be cheaper than the cast car.

The company now is building,

FIG. 1—New charging car is of all welded steel plate construction and equipped with roller bearings



FIG. 3—Another new, all welded steel charging car is of different design. It is equipped with MCB bearings

both in all welded and cast steel body types, 185 ingot cars for one steel maker, 60 ingot cars for another, 137 charging cars for another and 45 charging cars for a fourth.

Enlarged Diagrams Afford Quick Calculation

Quantitative heat transmission problems relating to open-hearth and other high-temperature furnaces now may be solved graphically by a set of eight charts, each 11 $\frac{1}{2}$ x 16 inches, devised by W. C. Buell Jr. The charts are abstracted from the author's two-volume work, "The Open-Hearth Furnace," but enlarged for the benefit of those who would solve such problems with a greater

degree of accuracy than is possible from the use of the similar but smaller reproductions presented in volumes I and II.

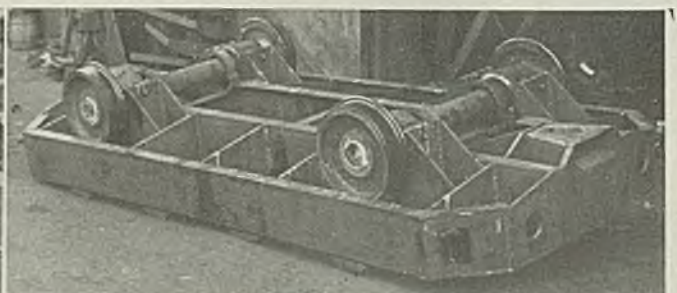
The first page of graphs, including eight charts, permits the finding of the individual thermal resistances of the several refractory and insulating materials usually employed in the practice. The next six pages of charts are applicable to furnace components such as bottoms, walls or roofs and may be solved for all heat flow effects through the use of the appropriate diagram. The eighth page gives the diagram by which heat transmitted from flame or flowing furnace gas to metal, slag or refractory may be found with considerable accuracy.

The "Buell Diagrams" suitable for calculation to close limits and amply bound, may be secured from STEEL at a cost of \$5.00 per set, postpaid.

Removal of Billet Samples By Machine Cuts Cost

Removal of etching samples from high-grade steel billets by machine cutting has reduced by over 90 per cent the cost of preparing these samples, according to the practice

FIG. 2—This bottom view shows design details of new all welded steel charging car



followed at one plant. The first and the last billet from each bloom has a sample removed for this test. After etching, if either specimen shows a segregation of gas inclusions or other piping, the next billet from each end of this bloom is tested. These tests are continued until piping or segregation is absent. It is done in this manner because these defects always run from the top or the bottom of a bloom toward the middle and they appear in the first or last billets being rolled from each bloom.

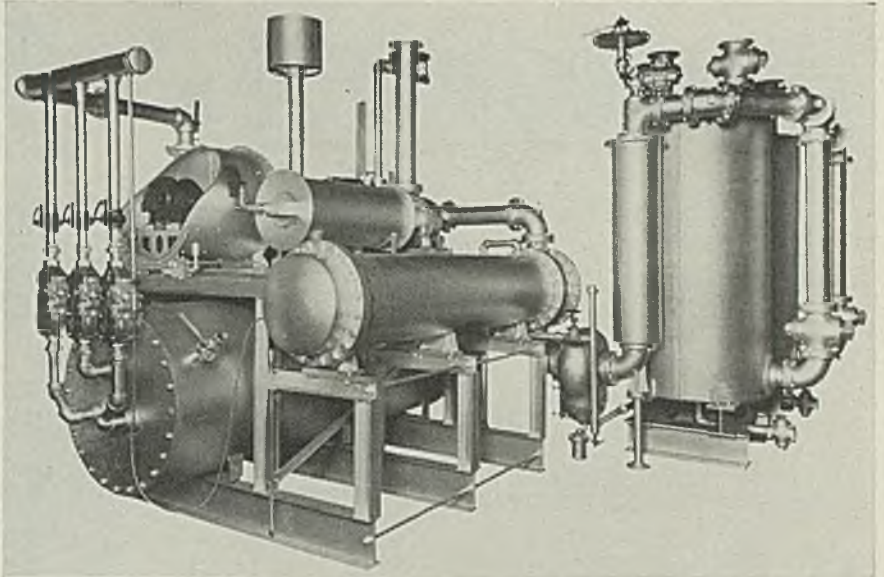
The former method of taking samples was to use the mechanical cold saw. Now samples are taken by flame cutting. The billets are of various sizes, the largest being 16 inches. A single example will illustrate the savings which were effected by the use of the machine-guided blowpipe. Samples from vanadium steel, 2½ x 8 inches cross section removed by the cold saw, cost approximately \$1.35 to \$1.85. The same cuts made with the oxy-acetylene machine-guided blowpipe cost about \$0.08.

In this plant, a portable cutting machine now is employed for making these samples. At the outset the samples were cut from the billet with a hand blowpipe and then brought into the shop where a second cut was made with the mechanical-operated blowpipe to get a surface sufficiently smooth to make the etching test. By this arrangement from 2 to 3 inches of steel from each billet tested was lost and two cutting operations were required. With the present arrangement, this double cutting is eliminated.

◆ ◆ ◆ Steelmakers Plan Soaking Pit Modernization

In a number of steel plants a movement is under way to modernize existing soaking pits. New soaking pits with automatic control for temperature, atmosphere and pit pressure have shown what can be done. One fuel engineer estimates that existing pits may be provided with such automatic control at an investment of \$1500 to \$2000 per pit, no matter what fuel is used, and that such installations will pay for themselves in a year. He estimates that the saving with such an installation is easily 50 cents per ton, of which 30 cents is in fuel saving and 20 cents in the increased metallic yield. An advantage with automatically controlled pits is that the defects that come out of the pit are defects that went into the pit, thus preventing quarrels as to whether defective steel should be charged against the open hearth or the mill.

Too, a good start has been made



15,000 cubic foot per hour Kemp atmos-gas producer with activated alumina dryers—one of a number of such units fabricated for a leading steel producer to furnish dry prepared gas to annealing furnaces used for the bright annealing of strip steel and tin plate

at some plants in establishing control of all heating furnaces, eliminating mistakes in judgment that result when the eye is relied upon to gage the temperature of the steel.

◆ ◆ ◆ Sodium Fluoride Used More Widely with Rimmed Steel

Sodium fluoride is being used on a much larger scale for producing rimmed steel ingots with thicker skin, according to Open Hearth Combustion Co., Chicago. Between 4,000,000 and 5,000,000 tons of ingots per year now are so treated and a number of companies, which have not hitherto used sodium fluoride, now are experimenting with it. The practice, by the Open Hearth Combustion Co.'s process, is

to drop 2 to 3 ounces of sodium fluoride per ton of steel into the mold during the pouring operation and after a cushion of 3 or 4 inches of metal has covered the stool. This addition starts the rimming immediately and maintains it during the pouring stage. So far the process is restricted to top-poured ingots but some experiments now are being made in so treating bottom-poured ingots.

◆ ◆ ◆ Corrects Foaming Action

Foaming conditions in open-hearth slags is corrected by the use of powdered ferrosilicon and coke, according to practice followed at one shop in this country. Burned lime and mill scale is employed for the same purpose at another plant.



Harold C. BeMent

BEGINNING in next week's issue STEEL will present a series of four articles describing progress made in direct rolling of metals from the molten state to strip. The author, Harold C. BeMent, is a graduate metallurgist of wide experience in all phases of melting and rolling. Beginning his career twenty years ago in the laboratories of the Anniston Steel Co., he has since been connected with Watertown arsenal, Allis-Chalmers Mfg. Co., Swindell-Dressler Corp., and various other steel companies and foundries as foreman and superintendent of melting and rolling operations

POWER DRIVES



Increasing Speed Range

MACHINES designed for a wide range of diameters of work require some provision for maintaining the most suitable work speeds at the various diameters. Such is the work-drive problem in connection with lathes, boring mills and large cylindrical grinders, as, for example, in the drive to the roll grinder shown in the accompanying illustration, which is designed to grind both rolls and roll necks. This grinder is built in different sizes for rolls of various diameters.

Ordinarily this unit is driven by an adjustable-speed motor with a speed range of 4 to 1. However, where the grinder is to be used on a wide range of roll diameters the drive shown is used, which gives an adjustable-speed range of 10 to 1 to provide the best speeds for large and small rolls and roll necks.

The entire drive to the work spindle, except the 20 to 40-horsepower adjustable-speed motor, de-

pending upon the size of the unit, is mounted in a pit, as shown, thus entirely removing any drive vibrations from the grinders. The cover to the pit and the guard over the drive have been removed in this view. The pit, however, is lighted and accessible through a manhole in the floor.

The wide speed range of 10 to 1 on the work spindle is obtained through a countershaft drive with a clutch operated from a handwheel above the floor level to engage either of the two sheaves. This is the only speed change on any of the motors driving the grinder which requires the operator to leave his position on the moving wheel carriage.

The drive is entirely V-belt equipped from the motor to the headstock sheave to absorb any vibration. Idler sheaves with a screw-down are placed next to the large sheaves on the countershaft to tighten the belts. The final drive from the countershaft to the headstock sheave is made with seven 2-inch V-belts. On the countershaft

seven and eight 1¼-inch V-belts are used on the two drives.

The countershaft is mounted on antifriction bearings in adjustable pillow blocks. The bearings are totally enclosed and sealed. The clutch is of the jaw type. On roll grinder drives where the wider variation in speeds are not required the clutch and one set of V-belt sheaves are omitted, thus providing approximately the 4 to 1 speed variation of the adjustable-speed motor.

On this roll grinder the drive motors to the grinding wheel, the headstock and the carriage traverse are of adjustable-speed type. Motors for oil and water pumps and wheel head cross movement are of the constant-speed type. All controls, panels and push buttons are mounted on the moving wheel carriage easily accessible to the operator.

Proper Alignment Pays

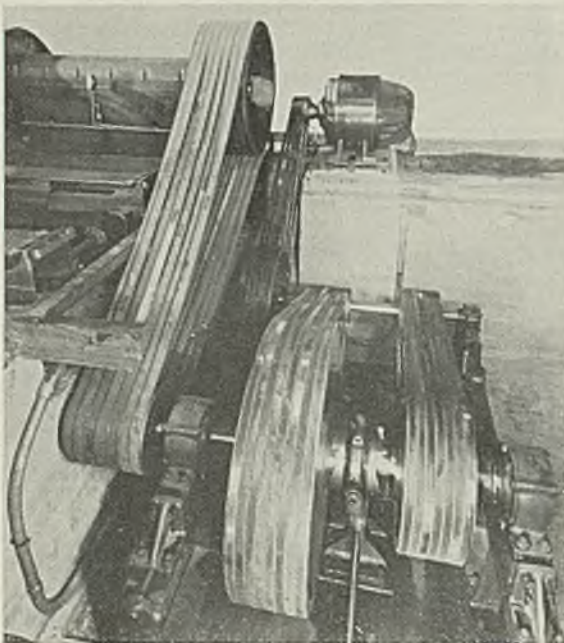
MISALIGNMENT of shafts connected by belt, gears or chain is one of the common causes of drive trouble.

Shaft alignment may be in either of two planes. It may be due to the shafts being in the same plane but not parallel so that, if extended, they would touch each other at one end.

On the other hand the planes of the shafts, extended, may cross each other at an angle, either almost crossing, if extended, or extending in different directions, as in the quarter-turn belt.

Even slight misalignment of this type, such as may result from a settling of a foundation or separate, improperly-set base plates, results in excessive wear on chains or gears and high friction load, if not quick breakage.

Belts, on the other hand, may adapt themselves to such conditions, if misalignment is not too excessive and pulleys are set properly to compensate. A good example of this is the quarter-turn belt drive. V-belts also operate fairly

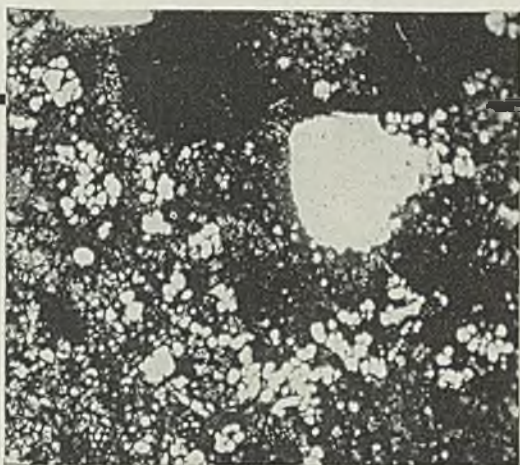


ON this roll grinder a 10 to 1 range of headstock speeds for large and small rolls and roll necks is provided by this double countershaft drive

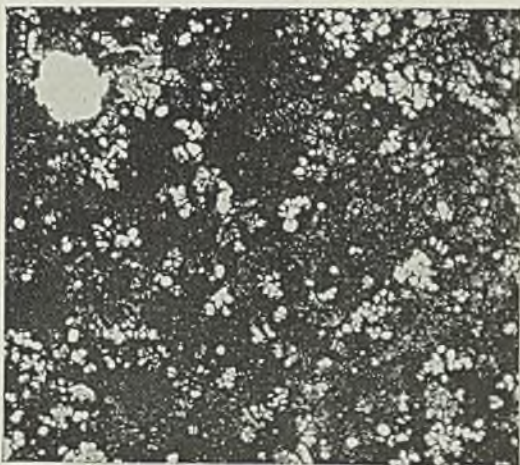


MODERN PROCEDURE IN ALLOY STEEL PRODUCTION

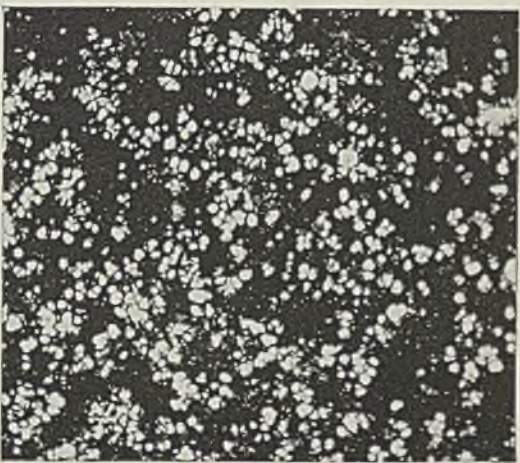
A Series of Advertisements based on Timken Methods



Photopetrograph of slag sample taken early in working period of heat. Magnification, 20 diameters. Small white areas represent silicate compounds. Dark areas are compounds high in Fe_o and Fe_2O_3 .



Photopetrograph of slag sample taken about half way in working period of heat. Magnification, 20 diameters. Small white areas represent silicate compounds. Dark areas are compounds high in Fe_o and Fe_2O_3 .



Photopetrograph of slag sample taken just before tapping. Magnification, 20 diameters. Small white areas represent silicate compounds. Dark areas are compounds high in Fe_o and Fe_2O_3 .

No. 9

Slag Control

Slag is so important in alloy steel production that it may be said the melter makes slag rather than steel. His motto is: "Take care of the slag and the steel will take care of itself."

Upon the control of slag formation in the furnace during the progress of the heat depend both the chemical and physical properties of the steel.

Heretofore slag control has primarily been dependent upon the melter's experience plus routine slag tests. After several years of laboratory research, however, we have succeeded in placing it upon a more accurate and uniform basis by definitely developing the direction and limits of the reactions between slag and steel in hundreds of heats involving many different analyses. As a result the melter's work has been simplified and the chances of error correspondingly reduced.

There are three phases of slag research as practiced in our laboratory: (1) chemical analysis of slag; (2) petrographic examination of slag samples; (3) study of the appearance of slag cakes. By providing concrete data for the guidance of our melters they have a pronounced influence upon the quality and uniformity of TIMKEN Steel.

TIMKEN STEEL AND TUBE DIVISION
THE TIMKEN ROLLER BEARING
COMPANY, CANTON, OHIO

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

TIMKEN

ALLOY STEELS

satisfactorily with slight amounts of misalignment.

The effect of misalignment on a flat belt is to pull the belt crooked by stretching on one edge. Even though the belt may operate and stay on the pulley, due to the crown, it is so stretched out of line that it is difficult to patch or use on any other pulley.

Crown, however, should be relied upon to keep a belt on the pulley. Also, it is seldom good practice to crown both pulleys; the pulley of larger diameter should be flat.

With a crown of 1/16-inch, which should be ample for most well-designed belt drives, the center of the belt with 210 degrees arc of contact on a pulley must stretch about 1/4-inch more than the edges of the belt, due to the greater diameter of the crown. With 1/8-inch crown this stretch is doubled. As a result excessive crown sometimes breaks a belt in two at the center where it passes over the crown.

Even though the shafts may be properly aligned, pulleys, sprockets or gears may be out of line either due to improper setting or to shifting after installation. Much

damage to chain drives results from such improper alignment. V-belts will operate fairly satisfactorily under such conditions and are commonly recommended where alignment cannot be maintained due to necessary movement of the unit or excessive float of either drive or driven unit, or both. Flat belts also operate under such conditions if both pulleys are crowned.

Step-cone pulleys should be aligned so the belt does not rub the step to the adjacent cone nor ride over the edge. Either type of misalignment will wear and stretch the belt out of shape.

Rubbing shifter arms or a block placed to hold a belt on a misaligned pulley also result in edge stretch, excessive wear and maintenance and decreased belt life. Because a belt will operate under such conditions is no reason for permitting continued operation and the resultant increased expense in drive maintenance and replacement.

Putting the drive pulleys in proper alignment will usually cost less than the extra maintenance required from incorrect operation during a period of a few months.

♦ ♦ ♦

The problem of lubrication is not to eliminate friction but to substitute the friction of the molecules of the lubricant for that of the metals in bearing and shaft. This oil friction, therefore, is determined largely by the viscosity of the oil which, however, must be ample to withstand the crushing effect of the pressure of shaft and bearing or other metal-to-metal contacts.

Up Through The Roof



BELIEVED to be the largest vertical honing machine ever built is this No. 4030 model manufactured by Barnes Drill Co., Rockford, Ill. It was so high a penthouse had to be built on the plant's roof for clearance to erect and test the unit, several of which have been built

Use of Fan-Cooled Motors

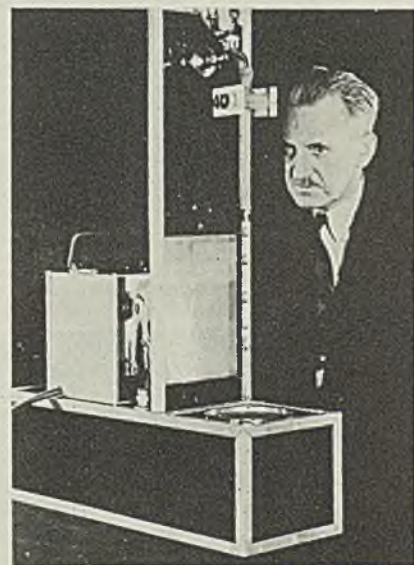
BECAUSE of the destructive action on motor windings of cast-iron and abrasive dusts many machine tool builders are recommending the use of totally-enclosed fan-cooled motors.

One type of these motors consists of totally-enclosed, squirrel cage, induction motor with internal and external ducts in the shell of the frame. The heat generated by the motor is fan circulated through the internal ducts and transferred or exchanged to the cooler, outside air, also fan circulated, through the external ducts. Several other makes of motors operate on a somewhat similar heat-exchanger basis.

Any dust, dirt, liquids or fumes in the atmosphere contact only the external ducts and do not get into the windings. This general type of totally-enclosed, self-ventilated motor has become very popular in automotive plants and other manufacturing and processing industries where motors are standardized to a large extent and any motor of proper size and rating may be installed in any location.

Such motors not only exclude abrasive and metallic dusts and dirt but also prevent the entrance of splashing liquids, mild chemicals and fumes. Outdoor applications are also possible. Lubricants are supplied through grease pipes extending to the outside. In one type of such motor a grease sump receives

Arrested Motion



LIGHT flashes of the duration of ten millionths of one second form the operating basis of this machine known as a stroboscope. Developed to observe parts while in motion, this device makes the study of their behavior as simple as if they were not moving at all. Dropping water, as shown in the illustration here, appears to stand still or even run backward into the faucet. Objects being studied move forward, backward or stand still according to the relationship of their speed to the frequency of these flashes. Photo courtesy Westinghouse Electric & Mfg. Co.

NEW EQUIPMENT



Punch Press—

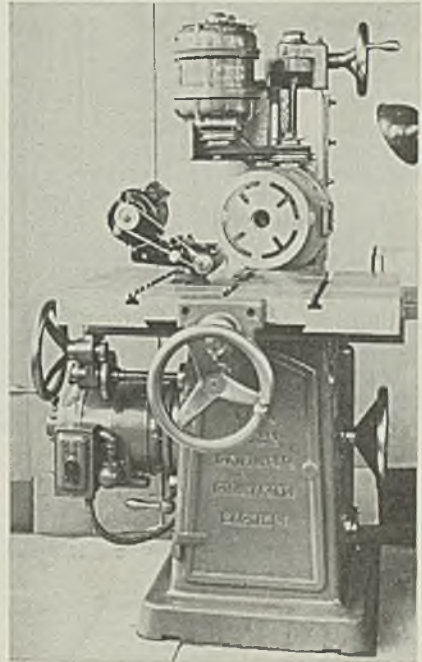
Super Speed Punch Press Corp., 55 Liberty street, New York, has begun manufacture of a high speed punch press built on a new principle and claimed to be different also in operation, results, use of dies and quality and volume of production. A continuous feeder keeps the stock moving without interruption. This is accomplished through an oscillating die that oscillates at the same speed as the feeder. The speed of the feed rolls is synchronized with the oscillation of the die by turning a hand wheel while the press is in operation. Adjustment for various size blanks is made by an adjustable crankshaft. The machine operates with a single die and can be stopped instantly without jar. Construction involves no cams, pawls or ratchets. The unit is adapted for short or long runs and coil or strip stock, while material waste is small. Feed control is adjustable in 5 seconds while running. The vibrationless machine is scientifically lubricated and of ball bearing construction. All parts under strain are made of high manganese molybdenum steel. The unit is capable of 1000 blanks per minute and produces a maximum num-

ber of blanks from the stock, it is stated.

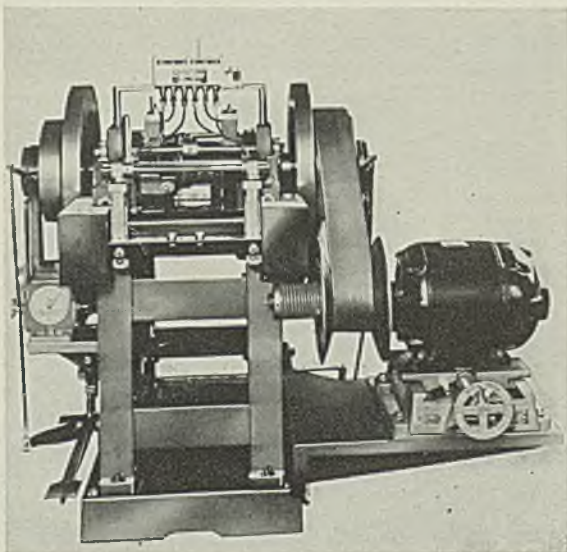
♦ ♦ ♦

Die Making Machine—

Frank W. Hack, 440 North Oakley boulevard, Chicago, has developed a single machine to meet the varied requirements of the die making industry. This multiple use machine, occupying but four square feet of floor space, was designed and built to do all the mechanical and most of the hand operations which have required the use of separate machines and expert artisans. It is claimed that the requirements met in performance of this machine include two distinct ranges of cutting properties, heavy and sensitive duty and the inclusion in one machine of reciprocating as well as rotary motion, together with the performance of a maximum number of operations with a minimum of attachments, each easy of adjustment and designed so that lifting of heavy parts is unnecessary. Stripped of all removable units the machine consists of base, compound table, and reciprocating rear ram adjustable for stroke of position and lockage in a stationary position if desired. To this ram is fitted a master head to which other attachments are fas-



Hack universal machine performs fifteen cutting operations



Super Speed punch press is built on a new principle and is capable of 1000 blanks per minute

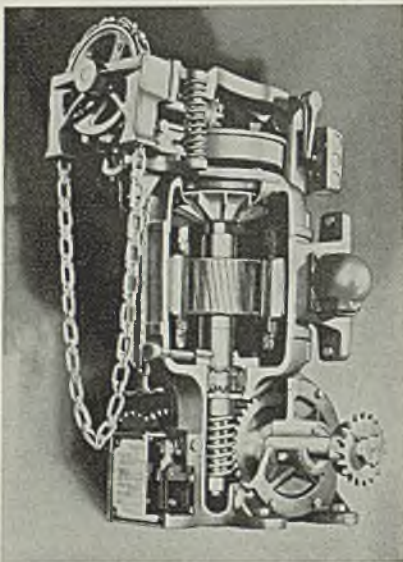
tened, and incorporated in the head is a back geared milling spindle vertically adjustable within the ram, thus embracing all the functions of a horizontal milling machine. The head also serves as a lathe spindle, increasing the adaptability of the machine. Multiple uses are made possible by the vertical head, which is simply and easily attachable. Rotable throughout a circle it affords eight speeds, four back geared and four high speed, and there are four speeds in the angular position, all back geared. In connection with this spindle, but removable from it, is the sensitive slotting head, also used for filing and lapping and other reciprocating operations, which can function at any angle. A hack saw frame instantly attachable to the master head and using standard blades can be used interchangeably with an elevated table or with the center plate in the table top. Fifteen different kinds of cutting operations are done with the regular

equipment and this number can be doubled with auxiliary adapters.

♦ ♦ ♦

Door Power Units—

Kinnear Mfg. Co., Columbus, O., is manufacturing an electric power unit for rolling doors that provides a rugged and compact operator for any size new or old door. With control stations placed at any convenient point, the door can be remotely controlled by the press of a button. Door is driven by electric motor through reduction gearing. By momentary contact of the open or close button on the operating switch, the pilot circuit magnetically closes the main line reversing switch and starts the motor. The limit switch, at the termination of the door travel, opens the pilot circuit, thereby breaking the main circuit and simultaneously the magnetic brake closes, stopping the motor. Door can be stopped at any intermediate position by pushing the stop button, from which position it can either be opened or closed. Provision is made for emergency manual operation by hand chain in event of interrupted power service. Each Kinnear power unit comprises power unit supports, motor reduction gears, magnetic brake, limit switch, emergency manual operation with interlocking limit switch, reversing panel and single station push button control. Motor is a series wound type for direct current and of high starting torque, elevator type for alternating current. Push button control is three button type—open, close, and stop. Magnetic reversing panel for remote control is fully enclosed and mechanically interlocked. Wire, con-



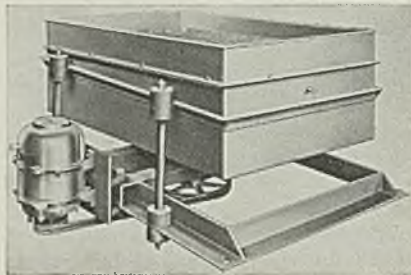
Kinnear unit opens and closes any type new or old rolling door by electric power through reduction gearing

duit and fuses are provided by others in accordance with wiring diagrams supplied by the Kinnear Mfg. Co.

♦ ♦ ♦

Gyratory Screen—

Beardsley & Piper Co., Chicago, are marketing a gyratory screen that features rubber mounting and vibration dampeners on all supports. Two large, heavy-duty, rubber cushions are used to absorb vibrations at each of four positions on the screen and on the supporting structure. Thus no vibration is imparted to surrounding equipment or superstructure. Screens operate with a flat slope and are motivated by a revolving throw unit that imparts



Gyratory screen features rubber mountings and vibration dampeners

to the screen a constant reciprocating, gyratory motion that the manufacturer claims cannot be stalled by overloading. Screens are of stepped design to serve as lump breakers and are of extruded metal, secured to the frame in such a way as to make replacement simple and easy. Drive is through multiple Texropes and sheaves, with motor mounted on either of four sides or below the screen frame, as desired. These gyratory screens are made in sizes to suit any capacity or size of operation and in single or multiple deck types.

♦ ♦ ♦

Midget Welder—

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced the Midget Marvel alternating-current welder for low-cost maintenance, repair, and light construction work. This Lilliputian outfit comprises a special transformer and control especially designed for alternating-current arc welding, and has an unusually high operating efficiency averaging 87 per cent at normal loads. A 50 and a 60-cycle model are available. The current range of the sets is from 30 to 140 amperes with twelve steps of current adjustment. The secondary open voltage is 50 on low range and 55 on the high. Primary current input for welding at 140 amperes is 70 amperes at 110 volts and 35 amperes at 220 volts, and is proportionately lower than



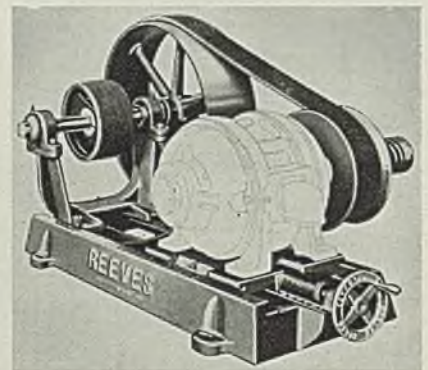
Westinghouse Midget Marvel is a small, low-cost, alternating-current arc welder

when welding at lower ranges. The set is designed for use with coated electrodes from 1/16 to 5/32-inch diameter. The welder is easily portable, being equipped with handles and casters for readily moving to convenient locations. The 60 cycle set weighs 112 pounds and the 50 weighs 130 pounds. Complete accessories included with each set consists of welding lead with holder and current adjusting plug attached, ground lead with handy C-clamp, helmet, wire brush, liberal supply of crucible weld electrodes and primary lead.

♦ ♦ ♦

Motor Pulley—

Reeves Pulley Co., Columbus, Ind., has developed a new design of the Vari-Speed motor pulley, countershaft type. The new pulley is a variable speed unit mounted on the standard shaft extension of any constant speed motor. It forms direct drive from motor to driven machine. Through handwheel control, a sliding base on which motor and unit are mounted is moved forward or back, varying the diameters of a set of adjustable disks from which a V-belt runs to the driven machine. Desired speed changes are made as the belt runs from maximum to minimum disk diameters. For requirements of either unusual speed reduction or speed increase, a countershaft is mounted on a common base with the rest of the unit. Pulley may be mounted in the center



Reeves Vari-Speed motor pulley is mounted on standard shaft extension of any constant speed motor

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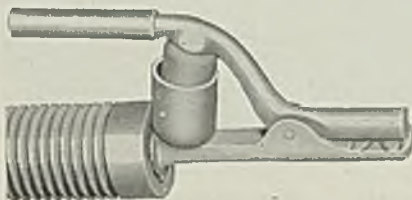
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of the countershaft, between the two bearing housings, thus providing a more compact unit. While a straight-faced pulley is illustrated, power take-off may also be from sprocket, pinion, multiple V-belt, sheave or any other accepted drive. Countershaft supports are rigid and heavily braced to eliminate vibration or twisting in the countershaft. The pulley is built in seven sizes, transmitting from fractional to $7\frac{1}{2}$ horsepower and covering speed ratios of 3 to 1.

• • •

Electrode Holder—

Jackson Electrode Holder Co., 6553 Woodward avenue, Detroit, has a new type of easy-to-handle electrode holder combining light weight with maximum conductivity and small enough to be manipulated in tight places. The new model B-4 weighs 15 ounces and has a current capacity of 200 amperes. It handles rods $1/16$ to $3/16$ -inch and is made entirely of Mallory 3 Metal. This alloy insures strength and at



Jackson electrode holder combines light weight with maximum conductivity

the same time has 85 per cent of the conductivity of pure copper. The handle installation is thoroughly ventilated and upper tong and compression spring are amply protected by fiber insulation.

• • •

Heavy-Duty Switch—

Delta-Star Electric Co., 2400 Fulton street, Chicago, is manufacturing a single pole unit of a three pole, 15 kilovolt, 1200 ampere three pole manual or motor operated type FM-139 disconnecting switch for inverted mounting. Two fixed insulators and one rotating insulator are of post construction with flashover values of 85 kilovolts dry and 50 kilovolts wet. The rotating insulator is equipped with ball bearings. The blade raises first to a parallel position then changes to a lateral.

Reader Comments

(Concluded from Page 9)

erally and very good ideas of our equipment in particular.

When the salesmen's reports are

received they are not merely filed, without consideration. The calls made by the representatives are first credited to the salesman sending in the reports. Each quarter each representative is advised of the number of calls he made and his calls are compared with those made by other salesmen. It is easy, therefore, to show the inactive salesman just what can be done if he is active and really on the job.

We get many reports in which our salesmen do not hesitate to inform us quite plainly of their recommendations regarding design, quality of workmanship and price. Such reports are given consideration by every department involved.

It will be well here for us to give a brief description of the mechanical set-up of our organization. We have a vice president in charge of all designing, engineering, and manufacture. Under him are the designing department in charge of our chief engineer. There are two engineering departments, one for Landis die heads and one for Landis chasers. Each engineering department is headed by an engineer with long experience in thread cutting. The superintendent in direct charge of manufacture also reports to the vice president.

We receive a report from a salesman in which a change is suggested regarding design of a die head. Four copies are made of this report. One copy goes to the vice president, two to the die head engineering department and the fourth to the chief engineer. The vice president, the head of the die head engineering department, and the chief engineer consider the suggestion offered. One of the two copies sent to the die head engineering department is returned to the sales department with comments.

If it is found that the suggestion can not be used, the reason is explained in detail. If it is decided that the suggestion be adopted the one copy of the report is sent to the sales department with information as to when the change will be effected. A letter is then sent to all salesmen and service men advising them of the change and when it will be effective.

If a report is received regarding improper workmanship, five copies of the report are made. One copy is sent to the vice president, two to the chief engineer, one to the die head engineering department, and one to the superintendent. If heat-treatment of any part is involved, a copy of the report will also be sent to the metallurgical department. After thorough consideration of the complaint, the chief engineer returns one copy of the report with the result of the investigation.

If we have a complaint direct from the customer or through our representative in reference to

trouble with chasers, copies of the customer's letter or the representative's report are sent to those in charge. The investigation made is not primarily to dispose of the particular case in hand.

A real effort is made to determine the cause of the difficulty and to improve if possible any operation involved in the manufacture of the chasers. At times, the investigation plainly shows improper handling on the part of the customer. Again, we have found due to our investigation, ways to make improvements which means a better product for all of our customers.

Each representative visits our main office and plant at least once a year and arrangements are then made to have them spend a certain amount of time with each department head. Complaints and suggestions are thoroughly discussed with the aim of developing improvements in design and manufacture.

We have encouraged our representatives to report about jobs which ordinarily would not seem to be proper for our equipment. In this manner, we have been successful in eliminating many limitations of die heads and machines. Such reports have enabled us from time to time to add to our line of equipment.

Naturally, the sales manager should spend a goodly portion of his time contacting customers in various territories. I think it is also necessary that heads of the various mechanical departments contact the trade with the salesmen. In this manner, members of the mechanical department will learn at first hand how our equipment is being used and under what conditions it is operated. They will learn of the acceptability of our product and what is more important, they will learn of the value which our product is giving to the customer.

It is true that the sales manager should be responsible for having the salesmen's reports considered properly and for arranging for contacts between the engineering and manufacturing departments and the customers. Nevertheless, I firmly believe that even with a passive sales manager, the salesmen and service men, if properly guided, will demand that the proper attention be given to these matters. Salesmen may be temperamental but a good salesman knows what he is traveling for. He knows that more orders mean a better salary and a higher commission. You can, therefore, depend upon a good salesman to see to it that the home office treats his reports with the proper consideration and that improvements are made where required. This, at least, is our experience.

C. N. KIRKPATRICK
Secretary and Sales Manager,
Landis Machine Co.,
Waynesboro, Pa.

Rearranges Equipment To Avoid Plant Addition

(Concluded from Page 50)

rrangement was being effected, production did not stop except as individual machines were moved. However, output decreased about 25 per cent during the month which was required to make the changes and this necessitated considerable overtime to maintain the required schedules. Within 30 days, production was back to normal and from then on was increased gradually to between 25 and 30 per cent over that which had been obtained previously from the same force and equipment.

This plant rearrangement not only eliminated the former floor handling between operations but cleared sufficient floor space to accommodate two additional rows of machines to be added whenever production demands should require the extra capacity. Increasing the size of the building, which would involve an annual expense in interest and taxes far in excess of the cost of rearranging the plant, is completely out of the picture for the present.

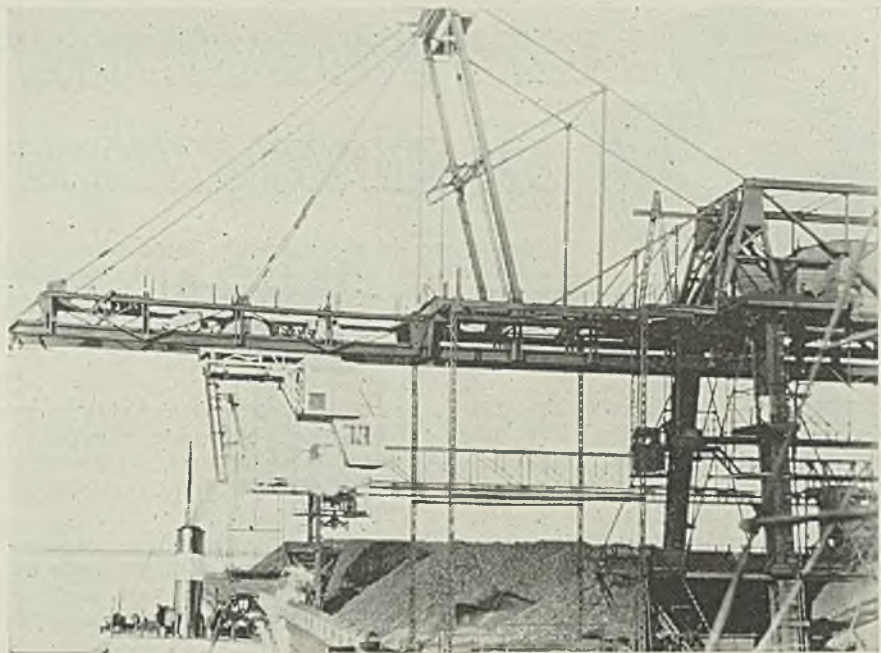
New Trolley and Bucket Double Bridge Capacity

DOUBLING the capacity of a ship unloading coal bridge of the Pittsburgh Coal Co. of Wisconsin at Superior, Wis., was accomplished recently by installation of a specially-designed, light-weight electric man trolley and clamshell bucket constructed of alloy steel and aluminum.

The trolley, fabricated by the Dravo Corp., Pittsburgh, was designed to run on one of the coal company's existing coal bridges. It carries a special-type of 12-ton coal bucket in place of the former bucket of 6-ton capacity, without any changes in the bridge structure. The installation is shown in the accompanying illustration.

Hoisting speed is 300 feet per minute; trolley speed is 850 feet per minute; and turntable speed is four revolutions per minute.

Weight of the trolley, without bucket and load, is 67,000 pounds. It is equipped with seven motors, two of which are hoist motors, one for the bucket closing lines and one for the bucket holding lines; two



THIS coal unloading bridge at Superior, Wis., has had its capacity increased from 6 to 12 tons by replacing its trolley and bucket with a new light-weight trolley and bucket built of alloy steel and aluminum. No changes were made in the bridge structure

trolley travel motors, one turntable motor, and two blower motors. The motors were supplied by General Electric Co., Schenectady, N. Y., and are equipped with brakes and controls made by Cutler-Hammer Inc., Milwaukee.

The bucket, built by the Hayward Co., New York, is fabricated from arc welded steel and aluminum. Its

weight is 22,200 pounds, which is less than its lifting capacity.

The new trolley, with stress members of alloy steel and cab and gear guards of aluminum, made it possible for the coal company to shut down one of the two existing bridges at Superior and to do all the work with a single bridge. The trolley is of the turntable type with the bucket ends of the bucket lines supported on a turntable to provide a means for rotating the bucket from a transverse to a parallel position to facilitate cleaning operations in handling coal from cargo vessels.

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Seale - Filler Wire
Warrington



RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Welding — Stulz-Sickles Co., 134 Lafayette street, Newark, N. J., offers a new booklet entitled "A.B.C.'s of Manganese Steel Welding."

Machine Design—Lincoln Electric Co., Cleveland, has issued application sheet No. 56, series 2, dealing with design of miscellaneous machine parts.

Steam Condensers—Allis-Chalmers Mfg. Co., Milwaukee, has issued bulletin 1541 on steel shell, surface-type, steam condensers. It also describes auxiliary motor and turbine drives, condensate pumps.

Heaters, Gas-Fired—Surface Combustion Corp., Toledo, O., has issued a booklet which illustrates and describes a few typical SC gas-fired heat treating furnaces in the automotive industries.

Cranes—Cleveland Crane & Engineering Co., Cleveland Tramrail division, Wickliffe, O., has released a folder illustrating and describing applications and installations of its cranes and transfer bridges.

Expansion Joints — Yarnall-Waring Co., Chestnut Hill, Philadelphia, has issued bulletin EJ-1906, which covers Yarway expansion joints, wrought steel, cylinder guided, and gun packed or glad packed. Tables list prices, weights and dimensions.

Pumps, Centrifugal — Logansport Machine Inc., Logansport, Ind., is offering a folder illustrating and describing a new line of high or low pressure, Sure Flow centrifugal pumps for pumping coolant, water, oil or other fluids.

Magnet Controller—Electric Controller & Mfg. Co., Cleveland, has published a folder dealing with a new automatic-discharge type magnet controller and which shows views of the clean release afforded by this device.

Stokers, Cranes — Whiting Corp. has issued two bulletins. No. 222 deals with Whiting horizontal compression feed stokers and their advantages, while bulletin No. 224 presents a variety of designs of job, pillar and bracket cranes.

Crushers—C. O. Bartlett & Snow Co., Cleveland, has completed catalog No. 77 dealing with the com-

pany's line of crushers, pulverizers and feeders. There are 44 pages of engineering diagrams, capacity tables, suggestions for use, and illustrations.

Packings—United States Rubber Products Inc., mechanical goods division, has issued a new packing catalog featuring the eleven most commonly used U. S. packings, illustrated and chosen because they meet a large percentage of normal packing requirements.

Perforated Metals — Allis-Chalmers Mfg. Co., Milwaukee, has issued bulletin 1832, which illustrates various perforations, supplied in any metal used in flat or rolled screens up to 3/8-inch in thickness, and contains several tables of interest to users of perforated metals.

Magnetic Separators — Stearns Magnetic Mfg. Co., Milwaukee, has published, for foundry executives, a folder describing magnetic separation for sand reclamation, a folder discussing the need for eliminating tramp iron from coal, and a bulletin covering magnetic separator type AM.

Magnetic Separators—Dings Magnetic Separator Co., Milwaukee, has issued an illustrated folder on Dings magnetic separation, describing the type L automatic separator. Also available are two recent issues of "The Magnet," No. 10 being a foundry issue and No. 11 a ceramic industry number.

Gearing—Brad Foote Gear Works, 1301, South Cicero avenue, Cicero, Ill., has put out a new large catalog of 72 pages dealing with heavy-duty, worm gear, speed reducers; heringbone gear speed reducers; and couplings. The catalog includes illustrations, prices and many tables of ratios, ratings and dimensions.

Machinery, Finishing—Hammond Machinery Builders Inc., Kalamazoo, Mich., has a circular illustrating and describing the new Hammond automatic polishing and buffing machine, type J, and picturing and listing various products that can be finished on this machine, along with approximate hourly production rates.

Molybdenum — Climax Molybde-

num Co., 500 Fifth avenue, New York City, has issued a large booklet in de luxe loose-leaf binding and dealing with molybdenum in cast iron. Section 1 covers molybdenum in gray iron generally, section 2 deals with alloy iron, section 3 with alloy combinations, sections 4 with applications, and in the back is included a general index.

Welding — Lincoln Electric Co., Cleveland, has issued a new bulletin entitled "Building Better Pipe Lines Faster at Less Cost by Shielded-Arc Welding" and containing latest information and illustrations dealing with construction of pipe lines by electric welding for transportation of oil, gas and water. Photos from all parts of the world are interesting and many data tables and pertinent information are included.

Water Works—Youngstown Sheet & Tube Co., water works division, Youngstown, O., has compiled a de luxe bound, loose-leaf water works manual. It comprises 120 pages of practicable data about Youngstown special wrapped and lined steel water mains, and technical information for engineers and officials of water works and large industrial users of water mains. Useful tables and charts are included and the manual covers many branches of the subject of water mains.

Steel Maintenance Problems Simplified by New Material

(Concluded from Page 53)

is obvious. The usual procedure is then to scrape off the blister and treat the live rust with Rustarest compound. The entire structure is then ready for painting.

Power companies whose transmission towers have begun to rust at the joint have found that a liberal application of this compound at the danger spots followed by a coat of aluminum paint in a modified rust arresting vehicle solves their maintenance problem admirably.

Bridges are subjected to many corrosive agents such as smoke, vapors and gases. Those located in the vicinity of chemical plants and in seacoast areas are subjected to especially corrosive conditions. Ordinary paints in most cases have a very short life under these conditions. Similar cases have been found in steel mill pickling rooms, fences around industrial plants and many others.

Corrosive conditions vary widely and rust arresting compounds have been developed to meet many requirements. The full line comprises a group of over 30 products each designed to fulfill some particular phase of metal protection.

Better Steel Buying Begins To Appear

Production Rate Up;

Scrap Marks Time;

Heavy Steel Lags

ALTHOUGH steel buying is in small volume, and does not balance shipments from mills, signs of improvement in a number of products are taken as indications of a fall revival.

Steelmakers are maintaining a high rate of operation and in some instances have sufficient backlogs to maintain their present rate for several weeks. In the experience of two eastern mills orders in August were heavier than in July. A Chicago mill has bookings which will continue capacity production for at least 30 days.

Part of the gain in buying is due to early commitments by automobile builders and this is apparent in bars, sheets and strip, with some reflection in wire and wire products. It seems certain that these requirements must increase within a short time as automobile builders start on 1938 models.

One strong support to production is activity of agricultural implement manufacturers, who report the heaviest demand in several years. They are taking steady shipments of bars and other products. Oil country goods are in demand, especially oil-well tubing, in which substantial backlogs exist.

Semifinished steel specifications continue heavy and mills in the Pittsburgh district are seeking to supply consumers of ingots, billets and sheet bars who have orders for their products.

In steel plates deliveries have eased considerably although in some cases mills are booked for as much as eight weeks.

The soft spots in steel demand at present are found in absence of railroad buying, the carriers being practically out of the market, although planning heavy car and rail buying late in the year; and in structural steel and heavy plates. Construction is largely restricted to small projects, requiring lighter shapes, which do not run to tonnage.

With resumption of production at two Pittsburgh district plants the national operating rate rebounded 2 points last week, to 83 per cent. This is 1 point under the rate for the second week of August. Pittsburgh advanced 3.9 points to 83.4 per cent, Detroit 5 to 100 and Wheeling 0.3 to 89.5. There was no change at Chicago, 86.5 per cent; Eastern Pennsylvania, 65; Youngstown, 73; Buffalo, 86; Birmingham, 96; Cincinnati, 93; St. Louis, 84; and Cleveland, 79.5 per cent.

MARKET IN TABLOID

DEMAND . . . Increase in some products, principally automotive.

PRICES Steady, scrap largely nominal.

PRODUCTION . . Operations up 2 points to 83 per cent of capacity.

SHIPMENTS . . . Steady, with deliveries easier.

The only recession was in New England, where the rate declined 15 points to 60.

Automobile production last week dropped from 93,339 to 83,310, practically duplicating the previous week's decline. General Motors made 29,100 cars, compared with 32,954 the previous week and Chrysler 23,950, compared with 26,600. Ford continued at unchanged rate, 26,000 cars each week. Preparations for change to new models is the cause of the shortening of production, which is holding up closer than usual to the end of the model year.

In the scrap market dealers and consumers are engaged in a quiet contest over prices which has resulted in a lull in buying and consequently practically nominal quotations on steelmaking grades. Large consumers have not entered the market for some time and in the Pittsburgh district shipments on contracts have been embargoed by the leading interest. Dealers feel that supplies are light and tonnages would be difficult to obtain and are marking time to await developments. Meanwhile bids on two or three heavy railroad offerings will be made this week and some light is expected to be thrown on the situation by these figures.

For the third time this season the record for a single cargo of iron ore from the head of the lakes has been broken. The record now is 15,529 tons, which is 119 tons above the preceding record. The successive increases in cargoes is proof of the effort being made to bring down the maximum of ore this season.

STEEL'S composites all remained unchanged for the past week, finished steel prices being fixed and scrap prices being steady or nominal to a degree that precluded changes in quotations. Steelworks scrap composite is \$20.50, iron and steel composite \$40.36 and finished steel composite \$61.70.

COMPOSITE MARKET AVERAGES

	Aug. 28	Aug. 21	Aug. 14	One Month Ago July, 1937	Three Months Ago May, 1937	One Year Ago Aug., 1936	Five Years Ago Aug., 1932
Iron and Steel	\$40.36	\$40.36	\$40.32	\$40.03	\$40.06	\$33.88	\$28.77
Finished Steel	61.70	61.70	61.70	61.70	61.70	53.40	47.46
Steelworks Scrap ..	20.50	20.50	20.33	18.51	18.49	14.66	6.25

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

A COMPARISON OF PRICES

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

Finished Material

	Aug. 28, 1937	July 1937	May 1937	Aug. 1936
Steel bars, Pittsburg	2.45c	2.45c	2.45c	1.95c
Steel bars, Chicago	2.50	2.50	2.50	2.00
Steel bars, Philadelphia	2.74	2.74	2.74	2.26
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	1.85
Shapes, Pittsburgh	2.25	2.25	2.25	1.90
Shapes, Philadelphia	2.45½	2.45½	2.45½	2.11½
Shapes, Chicago	2.30	2.30	2.30	1.95
Tank plates, Pittsburgh	2.25	2.25	2.25	1.90
Tank plates, Philadelphia	2.43½	2.43½	2.43½	2.09
Tank plates, Chicago	2.30	2.30	2.30	1.95
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	1.95
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.50
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.20
Sheets, No. 10, hot rolled, Gary.	2.50	2.50	2.50	2.05
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.60
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.40
Tin plate, per base box, Pitts.	\$5.35	5.35	5.35	5.25
Wire nails, Pittsburgh	2.75	2.75	2.75	2.10

Semifinished Material

Sheet bars, open-hearth, Youngs	\$37.00	\$37.00	\$37.00	\$30.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	30.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	30.00
Wire rods, No. 5 to 3/4-inch, Pitts.	47.00	47.00	47.00	38.00

Pig Iron

	Aug. 28, 1937	July 1937	May 1937	Aug. 1936
Bessemer, del. Pittsburgh	\$25.26	\$25.26	\$25.26	\$20.81
Basic, Valley	23.50	23.50	23.50	19.00
Basic, eastern del. East Pa.	25.26	25.26	25.26	20.81
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	20.31
No. 2 fdy., Chicago	24.00	24.00	24.00	19.50
Southern No. 2, Birmingham	20.38	20.38	20.38	15.50
Southern No. 2, del. Cincinnati	23.69	23.69	23.69	19.44
No. 2X eastern, del. Phila.	26.135	26.135	26.135	21.68
Malleable, Valley	24.00	24.00	24.00	19.50
Malleable, Chicago	24.00	24.00	24.00	19.50
Lake Sup., Charcoal, del. Chicago	30.04	30.04	30.04	25.2528
Gray forge, del. Pittsburgh	24.17	24.17	24.17	19.67
Ferromanganese, del. Pittsburgh	107.29	107.29	107.29	80.13

Scrap

Heavy melting steel, Pittsburgh	\$22.25	\$19.40	\$19.55	\$16.00
Heavy melt. steel, No. 2, East Pa.	18.00	16.55	16.85	12.80
Heavy melting steel, Chicago	19.75	17.75	17.55	15.45
Rail for rolling, Chicago	21.75	20.30	21.45	16.40
Railroad, steel specialties, Chicago	22.25	20.20	21.35	16.65

Coke

Connellsville, furnace ovens	\$4.50	\$4.50	\$4.85	\$3.45
Connellsville, foundry, ovens	5.30	5.30	5.30	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

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

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.	
Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pacific ports, f.o.b. dock	2.95c
Hot Rolled Annealed No. 24	
Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, del.	3.48c
Philadelphia, del.	3.44c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pacific ports, f.o.b. dock	3.80c
Galvanized No. 24	
Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.09c
New York, delivered	4.13c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pacific ports, f.o.b. dock	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.39c
New York, del.	3.43c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pacific ports, f.o.b. dock	3.70c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.75c
Philadelphia, del.	3.84c
New York, del.	3.88c
St. Louis, del.	3.78c
Granite City, Ill.	3.75c

Enamelling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher.	
Tin plate, coke, (base box), Pittsburgh	\$5.35
Waste-waste, 2.75c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb. Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.53c
Philadelphia, del.	2.43½c
Boston, delivered	2.65c
Buffalo, delivered	2.50c
Chicago or Gary	2.30c
Cleveland, del.	2.44½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.45½c
New York, del.	2.50¼c
Boston, delivered	2.63½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.45c
Buffalo	2.35c
Gulf Ports	2.65c
Birmingham	2.40c
Pacific ports, f.o.b. cars, dock	2.80c
St. Louis, del.	2.52c

Bars

Soft Steel (Base, 3 to 25 tons)	
Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific ports, f.o.b. cars, dock	3.00c
Philadelphia, del.	2.74c
Boston, delivered	2.85c
New York, del.	2.78c
Pitts., forg. qual.	2.80c

Rail Steel

To Manufacturing Trade	
Pittsburgh	2.30c
Chicago or Gary	2.35c
Moline, Ill.	2.35c
Cleveland	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron	
Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined....	3.50-8.00c

Reinforcing	
New billet, straight lengths, quoted by distributors	
Pittsburgh	2.55c
Chicago, Gary, Buffalo, Cleve., Blrm., Young...	2.60c
Gulf ports	2.65c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.84c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh	2.40c
Chicago, Buffalo, Cleveland, Birm., Young....	2.45c
Gulf ports	2.80c

Wire Products

Prices apply to straight or mixed carloads; less carloads \$5 higher; less carloads fencing \$5 over base column.

Base Pitts.-Cleve. 100 lb. keg. Standard wire nails....	\$2.75
Cement coated nails	\$2.75
(Per pound)	
Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.20c
Galv. fence wire	3.60c
Woven wire fencing (base column, c. 1.)... \$74.00	
Single loop bale ties, (base column, c. 1.)...	63.00

To Manufacturing Trade	
Plain wire, 6-9 ga.	2.90c
Anderson, Ind. (merchant products only) and Chicago up \$1; Duluth and Worcester up \$2; Birmingham up \$3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up \$1, Worc. \$2.	

Cold-Finished Carbon Bars and Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)			
Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem			3.00c
Alloy			
S.A.E. Diff.	S.A.E.	Alloy Diff.	
2000.....0.35	3100.....0.70		
2100.....0.75	3200.....1.35		
2300.....1.55	3300.....3.80		
2500.....2.25	3400.....3.20		
4100 0.15 to 0.25 Mo.	0.55		
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10		
5100 0.80-1.10 Cr.	0.45		
5100 Cr. spring	0.15		
6100 bars	1.20		
6100 spring	0.85		
Cr. N., Van	1.50		
Carbon Van.	0.85		
9200 spring flats	0.15		
9200 spring rounds, squares	0.40		

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot rolled, 25-1ton)		
(Base, cold-rolled, 25-3 tons)		
Hot strip to 23½-in.		
Pittsburgh	2.40c	
Chicago or Gary	2.50c	
Birmingham base	2.55c	
Detroit, del.	2.60c	
Philadelphia, del.	2.69c	
New York, del.	2.73c	
Cooperage hoop,		
Pittsburgh	2.50c	
Chicago	2.60c	
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland		3.20c
Detroit, del.	3.40c	
Worcester, Mass.	3.40c	
Cleve. Worcester, Mass.		3.40c
Carbon		
0.26—0.50	3.20c	3.40c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)	
Standard rails, mill	\$42.50
Relay rails, Pittsburgh, 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago... \$43.00	
Do., rerolling quality..	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago 2.80c	
Do., axle steel	3.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plates, base	\$46.00
Base, light rails 25 to 60 lbs.; 20 lbs. up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base tie plates 20 tons.	

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:	
Carriage and Machine	
½ x 6 and smaller....	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1½ and 1¾-in.	60-5 off
Tire bolts	50 off
Plow Bolts	
All sizes	65-5 off
Stove Bolts	
In packages with nuts attached 72½ off; in packages with nuts separate 72½-5 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts	
S. A. E. semifinished hex.:	
½ to ¾-inch	60-10 off
Do., 9/16 to 1-inch....	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws	
Milled	50-10 off
Upset, 1-in., smaller	60 off
Square Head Set Screws	
Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland		3.60c
Structural, Chicago		3.70c
¾-inch and smaller, Pitts., Chl., Cleve.		65-5 off
Wrought washers, Pitts., Chl., Phila. to jobbers and large nut, bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off		

Cut Nails

Cut nails, C. L., Pitts. (10% disc. on all extras)	\$3.60
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Do., less carloads, 5 kegs or more, no discount on any extras...	\$3.90
Do., under 5 kegs no disc. on any extras....	\$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld Steel		
In.	Blk.	Galv.
¾	59½	49
1	62½	53
1-3	64½	55½
Iron		
¾	26	8
1-1½	30	14
1½	34	16½
2	33½	16

Lap Weld Steel		
2	57	47½
2½-3	60	50½
3½-6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron		
2	26½	10
2½-3½	27½	12½
4	29½	16
4½-8	28½	15
9-12	24½	10

Line Pipe Steel		
1 to 3, butt weld	63½	
2, lap weld	56	
2½ to 3, lap weld	59	
3½ to 6, lap weld	61	
7 and 8, lap weld	60	
10-inch, lap weld	59½	
12-inch, lap weld	58½	

Butt Weld Iron		
¾	25	7
1 and 1½	29	13
1½	33	15½
2	32½	15

Lap Weld		
1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld	
Sizes	Steel
1½" OD x 13 Ga.	\$10.45 \$23.71
1¾" OD x 13 Ga.	11.89 22.93
2" OD x 13 Ga.	13.31 19.35
2" OD x 11 Ga.	15.49 23.36
2¼" OD x 13 Ga.	14.82 21.68
2½" OD x 11 Ga.	17.38 26.02
2½" OD x 12 Ga.	17.82 26.57
2¾" OD x 12 Ga.	18.86 29.00
3" OD x 12 Ga.	19.73 31.36
3½" OD x 11 Ga.	24.89 39.81
4" OD x 10 Ga.	30.81 49.90
5" OD x 9 Ga.	47.57 73.93
6" OD x 7 Ga.	73.25

Seamless	
Hot Rolled	Cold Drawn
1" OD x 13 Ga.	\$ 8.41 \$ 9.46
1¼" OD x 13 Ga.	9.96 11.21
1½" OD x 13 Ga.	11.00 12.38
1¾" OD x 13 Ga.	12.51 14.09
2" OD x 13 Ga.	14.02 15.78
2¼" OD x 13 Ga.	15.63 17.60

2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton	
6-in. & over, Birm.	\$46.00-47.00
4-in., Birmingham..	49.00-50.00
4-in., Chicago	57.00-58.00
6 to 24-in., Chicago.	54.00-55.00
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00
Class A Pipe \$3 over Class B	
Std. ftgs., Birm., base.	\$100.00

Semifinished Steel

Billets and Blooms	
4 x 4-inch base; gross ton Pitts., Chl., Cleve., Buffalo, Young., Bham....	\$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets	
6 x 6 to 9 x 9-in. base Pitts., Chicago, Buffalo..	43.00
Forging, Duluth	45.00

Sheet Bars	
Pitts., Cleve., Young., Sparrows Point	37.00

Slabs	
Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods	
Pitts., Cleve., No. 5 to ¾-inch incl.	47.00
Do., over ¾ to 1¼-inch incl.	52.00
Chicago up \$1; Worcester up \$2.	

Skelp	
Pitts., Chl., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, fur.	\$4.40-4.60
Connellsville, fdry.	5.25-5.50
Connell, prem. fdry.	6.00-6.50
New River fdry.	6.50-6.75
Wise county fdry.	5.75-6.00
Wise county fur.	4.75-5.00

By-Product Foundry	
Newark, N. J., del.	10.85-11.30
Chl., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens.	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens.	7.25
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.00
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.60

Coke By-Products

Spot, gal. Producers' Plants	
Pure and 90% benzol.	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c
Per lb. f.o.b. Frankford and St. Louis	
Phenol (200 lb. drums) ..	14.75c
do. (450 lbs.)	14.00c
Eastern Plants, per lb.	
Naphthalene flakes and oals, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia.	\$28.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$25.00	\$25.50	\$23.50	\$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.†	20.38	20.38	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	23.50	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Hamilton, O.	24.00	24.00	23.50	24.50
Neville Island, Pa.	24.00	24.00	23.50	24.50
Prevo, Utah	22.00	22.00	21.00	22.00
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrows Point, Md.	25.00	25.00	24.50	25.00
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

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

Delivered from Basing Points:

	No. 2 Fdry.	Malleable	Basic	Bessemer
Akron, O., from Cleveland	25.26	25.26	24.76	25.76
Baltimore from Birmingham	25.58	25.58	24.46	25.58
Boston from Birmingham	26.37	26.37	25.87	26.37
Boston from Everett, Mass.	26.25	26.25	25.75	26.25
Boston from Buffalo	26.25	26.25	25.75	26.25
Brooklyn, N. Y., from Bethlehem	27.27	27.27	26.77	27.27
Brooklyn, N. Y., from Bmghm.	27.05	27.05	26.55	27.05
Canton, O., from Cleveland	25.26	25.26	24.76	25.76
Chicago from Birmingham	24.22	24.22	23.72	24.72
Cincinnati from Hamilton, O.	24.07	25.01	24.51	25.01
Cincinnati from Birmingham	23.69	23.69	23.19	24.19
Cleveland from Birmingham	24.12	24.12	23.62	24.62
Mansfield, O., from Toledo, O.	25.76	25.76	25.26	26.26
Milwaukee from Chicago	25.00	25.00	24.50	25.50
Muskegon, Mich., from Chicago	26.90	26.90	26.40	27.40
Toledo or Detroit	26.01	26.01	25.51	26.51
Newark, N. J., from Birmingham	26.39	26.39	25.89	26.39
Newark, N. J., from Bethlehem	26.39	26.39	25.89	26.39
Philadelphia from Birmingham	25.38	25.38	24.88	25.38
Philadelphia from Swedeland, Pa.	25.76	26.26	25.26	26.26
Pittsburgh district from Neville Island	26.25	26.25	25.75	26.25
Saginaw, Mich., from Detroit	26.25	26.25	25.75	26.25
St. Louis, northern	24.50	24.50	24.00	24.50

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	\$24.12	24.12	23.82	24.12
St. Paul from Duluth	25.94	25.94	25.94	26.44

†Over 0.70 phos.
Low Phos.
Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$28.50, Phila. base, standard and copper bearing, \$29.63.

Gray Forge	Charcoal
Valley furnace	\$23.50
Pitts. dist. fur.	23.50
Lake Superior fur.	\$27.00
do., del. Chicago	30.04
Lyles, Tenn.	26.50

Silvery†
Jackson county, O., base: 6-6.50 per cent \$28.50; 6.51-7—\$29.00; 7-7.50—\$29.50; 7.51-8—\$30.00; 8-8.50—\$30.50; 8.51-9—\$31.00; 9-9.50—\$31.50; Buffalo \$1.25 higher.

Bessemer Ferrosilicon†
Jackson county, O., base: Prices are the same as for silveries, plus \$1 a ton.
†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

Refractories

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

Fire Clay Brick	Magnesite
Super Quality	Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) .. \$45.00
Pa., Mo., Ky.	Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) .. 43.00
First Quality	Base Brick
Pa., Ill., Md., Mo., Ky.	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.
Alabama, Georgia	Chrome brick .. \$49.00
New Jersey	Chem. bonded chrome.. 49.00
Second Quality	Magnesite brick .. 69.00
Pa., Ill., Ky., Md., Mo.	Chem. bonded magnesite 59.00
Georgia, Alabama	
New Jersey	
Ohio	
First quality	43.70
Intermediate	39.90
Second quality	35.15
Malleable Bung Brick	
All bases	\$59.85
Silica Brick	
Pennsylvania	\$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	\$30.00
Wire cut	\$28.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	\$24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$20.00
Do., for barge	\$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	\$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.29
Spiegeleisen, 19-21% dom.	
Palmerston, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerston	39.00
Ferrosilicon, 50% freight allowed, c.i.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, \$5 a ton higher.	
Silicomani., 2% carbon	106.50
2% carbon	111.50; 1%, 121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	nom.
Ferrovandium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	142.50
Spot, carlots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn. basis, 18%, \$3 unitage	63.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% S3 unitage	80.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
*Carloads. Quan. diff. apply	

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper			Straits Tm.		Lead	Lead	Zinc	Alumi-	Antimony	Nickel
Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	Futures	N. Y.	East St. L.	St. L.	num 99%	American Spot, N. Y.	N. Y. odes
Aug. 21 14.00	14.12½	13.75	59.50	58.87½	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 23 14.00	14.12½	13.75	59.37½	58.87½	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 24 14.00	14.12½	13.75	58.87½	58.55	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 25 14.00	14.12½	13.75	59.12½	58.70	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 26 14.00	14.12½	13.75	58.62½	58.20	6.50	6.35	7.25	20.00	15.25	35.00
Aug. 27 14.00	14.12½	13.75	58.50	58.12½	6.50	6.35	7.25	20.00	15.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 14.00c Conn. copper

Sheets

Yellow brass (high)	19.75
Copper, hot rolled	21.87½
Lead, cut to jobbers	10.00
Zinc, 100-lb. base	12.25

Tubes

High yellow brass	22.50
Seamless copper	22.62½

Rods

High yellow brass	16.25
Copper, hot rolled	18.62½

Anodes

Copper, untrimmed	19.12½
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Wire

Yellow brass (high)	20.00
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OLD METALS

Nom. Deal, buying prices

No. 1 Composition Red Brass

New York	9.00-9.25
Cleveland	9.25-9.50
Chicago	9.50-9.75
St. Louis	9.00-9.25

Heavy Copper and Wire

New York, No. 1	11.25-11.50
Cleveland, No. 1	11.00-11.25
Chicago, No. 1	11.25-11.50
St. Louis, No. 1	11.00-11.25

Composition Brass Borings

New York	8.50-8.75
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Light Copper

New York	9.00-9.25
Cleveland	9.00-9.25
Chicago	9.25-9.50
St. Louis	9.25-9.50

Light Brass

Cleveland	5.25-5.50
Chicago	6.25-6.50
St. Louis	5.75-6.00

Lead

New York	5.75
Cleveland	5.00
Chicago	5.50-5.62½
*St. Louis	5.00-5.50

Zinc

*New York	3.75-4.00
Cleveland	3.00-3.25
*St. Louis	3.75-4.00

Aluminum

Borings, Cleveland	9.75-10.00
Mixed cast, Cleve.	12.75-13.00
Clms. soft, Cleve.	14.75-15.00
*Mixed cast, St. L.	12.75-13.00

SECONDARY METALS

Brass, ingot S5-5-5-5, lcl	14.25
Stand. No. 12 alum.	18.50

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore	4.00c
Boston††	4.05c
Buffalo	3.10c
Chattanooga	4.21c
Chicago (j)	3.85c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	3.93½c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.96c-4.11c
New Orleans	4.20c
New York† (d)	4.12c
Pitts. (h)	3.80c
Philadelphia	4.00c
Portland	4.50c
San Francisco	4.20c
Seattle	4.45c
St. Louis	4.09c
St. Paul	4.10c-4.25c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	4.21c
Baltimore*	3.25c
Cincinnati	4.05c
New York† (d)	3.65c
Philadelphia	4.00c
St. Louis	4.09c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	4.21c
Cleveland (c)	2.55c
Cincinnati	3.75c
Houston	3.25c
Los Angeles, c.l.	2.975c
New Orleans*	3.24c
Pitts., plain (h)	2.55c
Pitts., twisted squares (h)	3.95c
San Francisco	2.97½c
Seattle	2.975c
St. Louis	3.99c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore	3.90c
Boston††	3.92c
Buffalo	3.35c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland	3.86c
Detroit	3.95c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York† (d)	3.97c
Philadelphia	3.90c
Pittsburgh (h)	3.70c
Portland (i)	4.25c
San Francisco	4.05c
Seattle (i)	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

PLATES

Baltimore	3.90c
Boston††	3.93c
Buffalo	3.47c
Chattanooga	4.11c
Chicago	3.75c
Cincinnati	3.95c
Cleveland, ¼-in. and over	3.86c
Detroit	3.95c
Detroit, ⅜-in.	4.15c
Houston	3.10c
Los Angeles	4.30c
Milwaukee	3.86c
New Orleans	4.10c
New York† (d)	4.00c
Philadelphia	3.90c

Phila. floor	5.25c
Pittsburgh (h)	3.70c
Portland	4.25c
San Francisco	4.05c
Seattle	4.25c
St. Louis	3.99c
St. Paul	4.00c
Tulsa	3.60c

NO. 10 BLUE

Baltimore	3.95c
Boston (g)	4.00c
Buffalo	3.72c
Chattanooga	4.16c
Chicago	3.85c
Cincinnati	4.00c
Cleveland	3.91c
Det. 8-10 ga.	3.93½c
Houston	3.45c
Los Angeles	4.50c
Milwaukee	3.96c
New Orleans	4.35c
New York† (d)	4.07c
Portland	4.25c
Philadelphia	4.00c
Pittsburgh (h)	3.75c
San Francisco	4.30c
Seattle	4.50c
St. Louis	4.39c
St. Paul	4.10c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	4.50c
Boston (g)	4.75c
Buffalo	3.35c
Chattanooga*	4.06c
Chicago	4.45c-5.10c
Cincinnati	4.75c
Cleveland	4.66c
Detroit	4.68½c
Los Angeles	5.05c
Milwaukee	4.56c-5.21c
New York† (d)	4.82c
Philadelphia	4.65c
Pitts.** (h)	4.75c
Portland	5.15c
Seattle	5.35c
San Francisco	5.15c
St. Louis	4.84c
St. Paul	4.75c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	4.70c
Buffalo	4.10c
Boston (g)	5.30c
Chattanooga*	4.76c
Chicago (h)	5.10c-5.75c
Cincinnati	5.40c
Cleveland	5.31c
Detroit	5.40c
Houston	4.50c
Los Angeles	5.75c
Milwaukee	5.21c-5.86c
New Orleans*	5.75c
New York† (d)	5.47c
Philadelphia	5.30c
Pitts.** (h)	5.40c
Portland	5.90c
San Francisco	5.85c
Seattle	5.90c
St. Louis	5.49c
St. Paul	5.40c
Tulsa	5.20c

BANDS

Baltimore	4.20c
Boston††	4.25c
Buffalo	3.52c
Chattanooga	4.41c
Cincinnati	4.25c
Cleveland	4.16c
Chicago	4.10c
Detroit, ⅜-in. and lighter	4.185c
Houston	3.35c
Los Angeles	4.80c
Milwaukee	4.21c
New Orleans	4.75c
New York† (d)	4.32c

Philadelphia	4.10c
Pittsburgh (h)	4.00c
Portland	5.00c
San Francisco	4.80c
Seattle	4.95c
St. Louis	4.34c
St. Paul	4.35c
Tulsa	3.55c

HOOPS

Baltimore	4.45c
Boston††	5.25c
Buffalo	3.52c
Chicago	4.10c
Cincinnati	4.25c
Detroit, No. 14 and lighter	4.185c
Los Angeles	6.55c
Milwaukee	4.21c
New York† (d)	4.32c
Philadelphia	4.35c
Pittsburgh (h)	4.50c
Portland	6.50c
San Francisco	6.50c
Seattle	6.30c
St. Louis	4.34c
St. Paul	4.35c

COLD FIN. STEEL

Baltimore (c)	4.50c
Boston*	4.65c
Buffalo (h)	3.70c
Chattanooga*	4.86c
Chicago (h)	4.30c
Cincinnati	4.50c
Cleveland (h)	4.30c
Detroit	4.30c
Los Ang. (f) (d)	6.85c
Milwaukee	4.41c
New Orleans	5.10c

New York† (d)	4.57c
Philadelphia	4.53c
Pittsburgh	4.15c
Portland (f) (d)	7.10c
San Fran. (f) (d)	6.80c
Seattle (f) (d)	7.10c
St. Louis	4.54c
St. Paul	4.77c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.845c
Buffalo	3.39c
Chicago	3.87c
Cincinnati	3.82c
Cleveland (b)	3.60c
Detroit	3.43c
New York† (d)	3.92c
St. Louis	4.54c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up.)

Base	
High speed	69c
High carbon, Cr.	45c
Oil hardening	26c
Special tool	24c
Extra tool	20c
Regular tool	16c
Water hardening 12½c	
Uniform extras apply.	
BOLTS AND NUTS	
(100 pounds or over)	
Discount	
Chicago (a)	.55 to 60
Cleveland	60-5-5
Detroit	70-10
Milwaukee	.60 to 65

New Orleans	60
Pittsburgh	65-5

(a) Under 100 lbs., 50 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 0.15c higher.

On plates, shapes, bars, hot strip and blue annealed quantity extras and discounts as follows: Under 100 lbs., add \$1.50; 100 to 399 lbs., add 50c; 400 to 3999 lbs., base; 4000 to 9999 lbs., deduct 10c; over 10,000 lbs., deduct 15c. At Cleveland, under 400 lbs., add 50c, with \$1 minimum invoice.

†Domestic steel; *Plus quantity extras; **One to 9 bundles; †† 50 or more bundles; †New extras apply; ††Base 10,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Aug. 26

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports	Continental Channel or North Sea ports, metric tons	
		Quoted in dollars at current value	**Quoted in gold pounds sterling
PIG IRON			
Foundry, 2.50-3.00 Silicon	\$30.56 6 2 6	\$25.76	£ 3 4 6
Basic bessemer	19.59 3 18 6	23.57	2 19 0
Hematite, Phos. .03-.05	36.18 7 5 0*		
SEMIFINISHED STEEL			
Billets	\$39.30 7 17 6	\$26.96	3 7 6
Wire rods, No. 5 gage	54.02 10 16 6	48.92	6 2 6
FINISHED STEEL			
Standard rails	\$50.52 10 2 6	845.92	5 15 0
Merchant bars	2.45c 11 0 0	2.16c to 2.26c	6 0 0 to 6 5 0
Structural shapes	2.37c 10 12 6	1.94c	5 7 6
Plates, 1½-in. or 5 mm.	2.58c 11 11 3	2.57c	7 2 6
Sheets, black, 24 gage or 0.5 mm.	3.35c 15 0 0	3.17c	8 15 0
Sheets, gal., 24 gage, corr.	4.18c 18 15 0	4.07c	11 5 0
Bands and strips	3.07c 13 15 0	2.35c	6 10 0
Plain wire, base	4.35c 19 10 0	2.53c	7 0 0
Galvanized wire, base	4.52c 20 5 0	3.17c	8 15 0
Wire nails, base	4.13c 18 10 0	2.89c	8 0 0
Tin plate, box 108 lbs.	\$6.47 1 6 0		

British ferromanganese \$102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs	Belgian Francs	Reich Marks
Fdy. pig iron, St. 2.5	\$25.20 5 1 0(a)	\$18.94 505	\$27.80 825	\$25.35 63
Basic bessemer pig iron	24.95 5 0 0(a)	10.31 275	34.66 435	27.97 (b) 69.50
Furnace coke	8.73 1 15 0	5.92 158	7.25 215	7.65 19
Billets	39.30 7 17 6	27.19 725	32.35 960	38.83 96.50
Standard rails	2.26c 10 2 6	1.79c 1,050	1.88c 1,250	2.38c 132
Merchant bars	2.55c 11 9 0	1.63c 960	1.65c 1,100	1.98c 110
Structural shapes	2.46c 11 0 6	1.59c 935	1.65c 1,100	1.93c 107
Plates, 1½-in. or 5 mm.	2.61c 11 14 3	2.03c 1,195	2.06c 1,375	2.29c 127
Sheets, black	3.51c 15 15 0‡	3.42c 2,010‡	2.36c 1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.35c 19 10 0	3.66c 2,150	2.85c 1,900	6.66c 370
Plain wire	4.35c 19 10 0	2.52c 1,480	2.49c 1,650	3.11c 173
Bands and strips	2.72c 12 4 0	1.84c 1,080	2.33c 1,550	2.29c 127

*Basic. †British ship-plates. Continental bridge plates. ‡24 ga. †1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel a del. Middlebrough. b hematite. ††Close annealed. **Gold pound sterling carries a premium of 64 per cent over paper sterling.

Iron and Steel Scrap Prices

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

HEAVY MELTING STEEL

Birmingham†, No. 1	16.00-17.00
Birmingham†, No. 2	15.00-16.00
Bos. dock No. 1, exp.	18.00-18.50
N. Eng. del. No. 1	17.25
Buffalo, No. 1	20.00-20.50
Buffalo, No. 2	18.00-18.50
Chicago, No. 1	19.50-20.00
Cleveland, No. 1	19.50-20.00
Cleveland, No. 2	18.00-18.50
Detroit, No. 1	17.00-17.50
Eastern Pa., No. 1	19.50-20.00
Eastern Pa., No. 2	18.00
Federal, Ill.	15.50-16.00
Granite City, R. R.	17.50-18.00
Granite City, No. 2	15.50-16.00
New York, No. 1	†16.50
N. Y. dock No. 1 exp.	17.00
Pitts. No. 1 (R. R.)	23.50-24.00
Pitts., No. 1 (dlr.)	22.00-22.50
Pittsburgh, No. 2	19.50-20.00
St. Louis, R. R.	17.50-18.00
St. Louis, No. 2	15.50-16.00
Toronto, dtrs. No. 1	11.00-12.00
Toronto, No. 2	10.00-11.00
Valleys, No. 1	21.00-22.00

COMPRESSED SHEETS

Buffalo, dealers	18.50-19.50
Chicago, factory	19.00-19.50
Chicago, dealer	18.00-18.50
Cleveland	19.00-19.50
Detroit	18.00-18.50
E. Pa., new mat.	19.50-20.00
E. Pa., old mat.	15.50-16.00
Pittsburgh	22.00-22.50
St. Louis	14.00-14.50
Valleys	20.50-21.00

BUNDLED SHEETS

Buffalo	13.50-14.00
Cincinnati, del.	15.00-15.50
Cleveland	14.00-14.50
Pittsburgh	19.00-19.50
St. Louis	13.00-13.50
Toronto, dealers	8.00

SHEET CLIPPINGS, LOOSE

Chicago	13.75-14.25
Cincinnati	14.00-14.50
Detroit	13.25-13.75
St. Louis	11.50-12.00

STEEL RAILS, SHORT

Birmingham	17.00-18.00
Buffalo	24.00-25.00
Chicago (3 ft.)	21.50-22.00
Chicago (2 ft.)	23.00-23.50
Cincinnati, del.	23.50-24.00
Detroit	22.50-23.00
Pitts. 3 ft. and less	26.50-27.00
St. Louis, 2 ft. & less	20.00-20.50

STEEL RAILS, SCRAP

Boston district	†15.50-15.75
Buffalo	21.50-22.50
Chicago	19.50-20.00
Cleveland	21.00-21.50
Pittsburgh	23.00-23.50
St. Louis	21.00-21.50

STOVE PLATE

Birmingham	10.00-10.50
Boston district	†11.50-12.00
Buffalo	15.50-16.50
Chicago	11.00-11.50
Cincinnati, dealers	12.50-13.00
Detroit, net	12.25-12.75
Eastern Pa.	16.00-16.50
New York fdry.	†12.00-12.50
St. Louis	12.50-13.00
Toronto, dealers, net	9.50-10.00

SPRINGS

Buffalo	22.50-23.00
Chicago, coil	24.50-25.00
Chicago, leaf	22.50-23.00
Eastern Pa.	26.00-26.50
Pittsburgh	27.00-27.50
St. Louis	22.00-22.50

ANGLE BARS—STEEL

Chicago	21.50-22.00
St. Louis	20.00-20.50

RAILROAD SPECIALTIES

Chicago	22.00-22.50
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LOW PHOSPHORUS

Buffalo, billet and bloom crops	23.00-23.50
Cleveland, billet, bloom crops	24.50-25.00
Eastern Pa., crops	25.00-25.50
Pittsburgh, billet, bloom crops	27.00-27.50
Pittsburgh, sheet bar crops	26.50-27.00

FROGS, SWITCHES

Chicago	19.50-20.00
St. Louis, cut	19.50-20.00

SHOVELING STEEL

Federal, Ill.	15.50-16.00
Granite City, Ill.	15.50-16.00
Toronto, dealers	9.00-9.50

RAILROAD WROUGHT

Birmingham	13.50-14.00
Boston district	†10.00-10.25
Buffalo, No. 1	17.50-18.50
Buffalo, No. 2	21.00-21.50
Chicago, No. 1 net	16.00-16.50
Cincinnati, No. 2	18.50-19.00
Eastern Pa., No. 1	21.00-21.50
St. Louis, No. 1	15.50-16.00
St. Louis, No. 2	17.50-18.00
Toronto, No. 1 dlr.	15.00

SPECIFICATION PIPE

Eastern Pa.	17.00-17.50
New York	†12.50-13.00

BUSHELING

Buffalo, No. 1	18.50-19.50
Chicago, No. 1	17.50-18.00
Cincin., No. 1, deal.	15.50-16.00
Cincinnati, No. 2	10.00-10.50
Cleveland, No. 2	13.50-14.00
Detroit, No. 1 new	16.50-17.00
Valleys, new, No. 1	19.50-20.00
Toronto, dealers	9.00

MACHINE TURNINGS

Birmingham	6.00-7.00
Buffalo	12.50-13.50
Chicago	10.50-11.00
Cincinnati, dealers	12.00-12.50
Cleveland	13.00-13.50
Detroit	13.00-13.50
Eastern Pa.	14.00-14.50
New York	†10.00-10.50
Pittsburgh	15.25-15.75
St. Louis	10.00-10.50
Toronto, dealers	8.00-8.50
Valleys	15.50-16.00

BORINGS AND TURNINGS

For Blast Furnace Use	
Boston district	†9.50-9.75

BORINGS & TURNINGS

Buffalo	13.00-13.50
Cincinnati, dealers	11.50-12.00
Cleveland	14.00-14.50
Detroit	13.50-14.00
Eastern Pa.	13.00-13.50
New York	†10.00-10.50
Pittsburgh	15.50-16.00
Toronto, dealers	8.00-8.50

CAST IRON BORINGS

Birmingham	8.00-8.50
Boston dist. chem.	†10.00-10.25
Bos. dist. for mills	†10.00-10.25
Buffalo	13.00-13.50
Chicago	12.50-13.00
Cincinnati, dealers	11.50-12.00
Cleveland	13.50-14.00
Detroit	13.50-14.00
E. Pa., chemical	14.50-15.00
New York	†10.00-10.50
St. Louis	9.50-10.00
Toronto, dealers	9.00

PIPE AND FLUES

Cincinnati, dealers	13.00-13.50
Chicago, net	13.50-14.00

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	12.50-13.00
Cincinnati	12.50-13.00
Eastern Pa.	16.00-16.50
New York	†12.00-12.50
St. Louis	12.50-13.00

FORGE FLASHINGS

Boston district	12.75-13.00
Buffalo	18.50-19.50
Cleveland	17.50-18.00
Detroit	15.50-16.00
Pittsburgh	18.25-18.75

FORGE SCRAP

Boston district	†9.50-10.00
Chicago, heavy	21.50-22.00

ARCH BARS, TRANSOMS

St. Louis	20.00-20.50
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AXLE TURNINGS

Boston district	†11.00-11.50
Buffalo	16.00-16.50
Chicago, elec. fur.	17.50-18.00
Eastern Pa.	18.00-18.50
St. Louis	14.00-14.50
Toronto	9.50

STEEL CAR AXLES

Birmingham	19.00-20.00
Buffalo	22.00-22.50
Boston district	†24.00-25.00
Chicago, net	25.50-26.00
Eastern Pa.	26.00-26.50
St. Louis	24.00-24.50

SHAFTING

Boston district	†19.25-19.50
New York	†19.50-20.00
Eastern Pa.	25.50-26.00
St. Louis	19.50-20.00

CAR WHEELS

Birmingham	18.00-19.00
Boston dist., iron	†15.00-15.25
Buffalo, iron	19.00-19.50
Buffalo, steel	23.00-24.00
Chicago, iron	20.50-21.00
Chicago, rolled steel	22.00-22.50

Cincinnati, iron	19.50-20.00
Eastern Pa., iron	20.50-21.00
Eastern Pa., steel	26.00-26.50
Pittsburgh, iron	22.00-22.50
Pittsburgh steel	27.00-27.50
St. Louis, iron	20.00-20.50
St. Louis, steel	22.00-22.50

NO. 1 CAST SCRAP

Birmingham	15.50-16.00
Boston, No. 1 mach.	†15.00-15.50
N. Eng. del. No. 2	17.00
N. Eng. del. textile	18.50
Buffalo, cupola	18.00-18.50
Buffalo, mach.	19.00-20.00
Chicago, agrl. net.	14.00-14.50
Chicago, auto	15.00-15.50
Chicago, mach. net.	16.50-17.00
Chicago, rail'd net	15.00-15.50
Cincin., mach. cup.	17.50-18.00
Cleveland, mach.	19.50-20.50
Eastern Pa., cupola	21.00-21.50
E. Pa., mx'd yard	18.00
Pittsburgh, cupola	20.50-21.00
San Francisco, del.	13.50-14.00
Seattle	8.00-9.00
St. Louis, No. 1	14.50-15.00
St. L., No. 1, mach.	15.00-15.50
Toronto, No. 1, mach., net	16.00-17.00

HEAVY CAST

Boston dist. break	†14.50
N. Eng. del.	15.00-15.25
Buffalo, break	16.00-16.50
Cleveland, break	17.00-18.00
Detroit, break	14.50-15.00
Detroit, auto net.	16.00-16.50
Eastern Pa.	19.50-20.00
New York, break	†14.50-15.00
Pittsburgh	17.50-18.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	20.00
Buffalo	20.50-21.00
Chicago, R. R.	21.50-22.00
Cincin., agrl. del.	18.50-19.00
Cleveland, rail.	21.50-22.00
Detroit, auto	17.00-17.50
Eastern Pa., R. R.	20.00-20.50
Pittsburgh, rail	21.50-22.00
St. Louis, R. R.	20.00-20.50

RAILS FOR ROLLING

5 feet and over

Birmingham	19.00-20.00
Boston	†17.50-18.00
Buffalo	21.50-22.50
Chicago	21.50-22.00
Eastern Pa., R. R.	21.00-21.50
New York	†19.00-19.50
St. Louis	21.00-21.50

LOCOMOTIVE TIRES

Chicago (cut)	22.50-23.00
St. Louis, No. 1	19.50-20.00

LOW PHOS. PUNCHINGS

Buffalo	22.50-23.50
Chicago	22.00-22.50
Eastern Pa.	26.00-26.50
Pittsburgh (heavy)	25.00-25.50
Pittsburgh (light)	23.50-24.00

Iron Ore

Lake Superior Ore	
Gross ton, 51 1/4%	
Lower Lake Ports	
Old range bessemer	\$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore	
Cents, unit, del. E. Pa.	
Foundry and basic	
56.63% con.	9.00-10.00
Cop.-free low phos.	
58-60%	nominal
Foreign Ore	
Cents per unit, f.a.s. Atlantic	
Foreign manganiferous ore, 45.55%	
iron, 6-10% man.	*17.00

No. Afr. low phos.	20.00
Swedish low phos.	nominal
Spanish No. Africa	
basic, 50 to 60%	*16.00
Tungsten, Nov.-Dec.	
sh. ton, unit, duty	
pd.	nominal
N. F., fdy., 55%	7.00
Chrome ore, 48%	
gross ton. c.i.f.	\$25.50-26.50
*Nominal asking price for spot.	

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.	
Caucasian, 50-52%	
non. 52.00 to 53.00	
So. African, 50-52%	
non. 52.00 to 53.00	
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 68

Pittsburgh—Mill operations this week continue at about 76 per cent of capacity for the industry as a whole and galvanized sheet capacity is engaged to about 75 per cent. These rates are practically unchanged from the preceding week, and belief is expressed they may continue into next week. Specifications are slow and independent mills are able to promise deliveries around four weeks on one-pass annealed. The leading producer is offering deliveries in 8 or 9 weeks on hot-rolled and about 12 weeks on galvanized. Some small releases continue to be booked from automotive partsmakers but it would appear that the expected inflow of business from the automotive industry lies two or three weeks ahead.

Cleveland—Sheet deliveries continue to improve as shipments exceed specifications. Shipments to refrigerator and radio manufacturers have held up better than anticipated, although requirements from barrel manufacturers are disappointing. Shipments of cold-rolled material can now be made within two or three weeks, while hot-rolled material is still further extended.

Chicago—Sheet demand from the automotive industry is heavier but buying elsewhere holds at about the rate of the past several weeks. Production continues near capacity and with backlogs declining, deliveries gradually are improving. Shipments of cold-rolled sheets average around three to four weeks and hot-rolled material five to six weeks.

Boston — With few exceptions sheet consumers are placing little new tonnage. Better deliveries and fairly substantial stocks operate against additional immediate tonnage purchases, although consumption by industrial fabricators continues substantial, notably refrigerator and stove builders, and usually by stamping shops. Miscellaneous buying is slow, however, and jobbers are generally releasing fill-in specifications only. Small tank and container fabricators are buying spottily.

Philadelphia—Additional automotive releases are noted though new business from miscellaneous sources still lags. One stamping plant is still troubled by strikes but continues to operate a day shift. Edward G. Budd Mfg. Co. has let a contract for an addition to house new presses, indicating this interest will become a more important steel consumer. Large mills report sheet deliveries running four to six weeks

on cold-rolled, six to eight weeks on hot-rolled and eight to ten weeks on galvanized. Somewhat better deliveries are available from some other producers.

New York—Sheet buying is still spotty in most lines, although some sellers of electrical sheets report the best demand since late June. Stainless sheets appear in most sustained demand, reflecting buying by novelty manufacturer. About 300 tons for ventilating work at Queens courthouse, Jamaica, L. I., is pending, Almirall Co., 52 Park place, New

York, being low on the general contract.

Cincinnati — More sheet tonnage is being placed by automobile manufacturers, total of new orders last week being near 80 per cent of mill capacity. Other demand is well maintained. Backlogs have dwindled under continuously high operations until prompt deliveries are available on most specifications.

St. Louis—Specifications on sheets hold up well, but new buying has flattened somewhat, and no revival is looked for before mid-September.

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HOBART
THE FASTEST SELLING ARC WELDER ON THE MARKET TODAY

Relatively the heaviest tonnages are being accounted for by manufacturers of containers and stove-makers. Enameling stock is active, and the tin plate season is the best ever experienced.

Strip

Strip Prices, Page 69

Pittsburgh—Strip steel mills continue to catch up on their backlogs

and hot strip mill operation this week subsided one point to 58 per cent of capacity and cold strip has lost two points to 60 per cent of capacity this week. Some releases for small preliminary tonnages are being received from auto partsmakers, of narrow cold-rolled especially. The early part of next month is expected to witness releases of larger tonnages of the wide widths for auto body building.

Cleveland—Producers do not anticipate a general improvement in specifications for at least two weeks,

when resumption of production of new automobile models is expected. Most mills are anxious to book additional tonnage as shipments continue to exceed specifications, with the result that deliveries have been considerably shortened.

Chicago—Strip demand has headed upward moderately, following several weeks of unchanged volume. While part of this improvement is attributed to renewed automotive buying, better activity is appearing from miscellaneous users. Backlogs now are relatively small and fairly prompt delivery can be given.

Boston—Fill-in buying for prompt delivery, with the aggregate incoming volume of narrow cold strip light, is likely to continue about another week or two when volume industrial consumers are expected to cover on tonnage requirements. Meanwhile, deliveries on most special finishes can be done in three weeks or slightly less. Mill operations in some departments are off in line with uneven specifications, with backlogs smaller. Orders for hot strip are slowly mounting as re-rollers begin to cover against depleted items in stock, although the total tonnage of hot strip held by such mills is still substantial.

New York—Demand for narrow cold strip continues sluggish, buying being confined generally to replacement of consumer stocks lowered by well sustained consumption. There has been no widening improvement, but eastern producers note indications of a pick-up with mid-western accounts. Car-lot strip orders are few. Hot strip demand is light with deliveries under two weeks.

Philadelphia—Demand for narrow steel strip continues light, as reflected in deliveries, which average one to three weeks, the latter being exceptional. Some consumers are reported fairly well stocked.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 69

New York—Following lead of a Pittsburgh producer eastern bolt and nut manufacturers are reaffirming prices for fourth quarter. While business is off 15 to 20 per cent from the July volume it is still generally satisfactory. The largest tonnage placed here in some time involves 320 tons of bolts, rods, spikes and turnbuckles for the Queens park development, going through A. M. Hazell Inc., Liberty street, New York, to J. K. Larkin Co., New York. Another award involves 110 tons of spikes and 80 tons of bolts and nuts for a terminal for Central District Inc., Bayonne, N. J., placed with district sellers through J. Rich Steers

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Mills at AMBRIDGE, PA. and CHICAGO, ILL.

*Manufacturers of...Carbon and Alloy Steels...Turned and Polished Shafting
...Turned and Ground Shafting...Wide Flats up to 12" x 2". Warehouse stocks
carried by nationally known distributors

Inc., New York. About 150 tons of steel castings for moorings for this terminal are under negotiation.

Plates

Plate Prices, Page 68

Cleveland—Most mills continue operating at a high rate with backlogs extended three to four weeks. Small structural projects continue to bolster general requirements.

Chicago — Plate buying is fairly heavy considering the lull in railroad purchases. Absence of large orders for freight car building is causing a further reduction in backlogs despite moderately active demand from tank fabricators and miscellaneous users. Backlogs, while declining will sustain operations around their present level through September.

Boston—Heavier bookings by several district boiler shops is a factor enhancing the outlook for plate buying. Most of the larger shipyards are filled with work for the immediate future, tank requirements are slightly improved, miscellaneous demand tends upward and railroad shops are expected to consume more plates next month. Until recently there has been some shifting of tonnage by consumers from regular suppliers to mills able to meet delivery requirements.

New York — Improved specifications from local shipyards following end of the strike afford the only highlight in steel plates locally.

Philadelphia—Demand for steel plates continues slow with railroads and shipbuilders contributing little additional tonnage. Part of the current lull is attributed to the fact that during the period of active demand some consumers placed orders in several directions to assure best possible delivery. With this extra tonnage some have sufficient stocks for some time. One plate mill is booked eight weeks ahead, though deliveries in ten days are available from some other makers.

San Francisco—The general contract for the drydock at Mare Island, Calif., involving over 1000 tons, has been awarded to Geo. Pollock Co., San Francisco. Bids on the outstanding pipe inquiry of the year open next week and call for from 7400 to 9000 tons for a welded steel or plate lined reinforced concrete pipe line for the metropolitan water district, Los Angeles.

Seattle — Demand for welded steel oil barges is increasing and several contracts are pending in this area. Olympia Oil & Wood Products Co. is building a 3000-barrel barge requiring 90 tons of shapes

and plates furnished by Columbia Steel Co. A second unit is being built at Olympia, Wash., involving 38 tons of steel, furnished by Bethlehem Steel Co., Seattle.

Plate Contracts Placed

300 tons, Sunset reservoir, San Francisco, to Western Pipe & Steel Co., San Francisco.

250 tons, 4 to 26-inch 10-gage welded steel pipe, high pressure system, exposition site, San Francisco, to California Corrugated Culvert Co., Berkeley, Calif.

175 tons, two 300,000-gallon elevated

tanks, Baltimore county, Maryland, to Chicago Bridge & Iron Co., Chicago; bids Aug. 23, S. A. Green, chief engineer, court house, Towson, Md.

175 tons, mostly plates, Panama canal, to Central Iron & Steel Co., Harrisburg, Pa.

160 tons, 30-inch 10 gage welded steel pipe, metropolitan water district, Los Angeles, to Southern Pipe & Casing Co., Los Angeles.

150 tons, 500,000-gallon steel tank on 110-foot tower, Jackson, Miss., to Chicago Bridge & Iron Co., Chicago; \$35,895.

133 tons, 20 oil tanks for metropolitan water district, Los Angeles, to Southwest Welding & Manufacturing Co., Alhambra, Calif.

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Unstated tonnage, 15 sections pontoon pipe, 32 inches diameter, each 52 feet long, for United States engineer, Memphis, Tenn., to American Rolling Mill Co., Middletown, O.

Plate Contracts Pending

1040 tons, drydock, Mare Island, Calif.; general contract to Geo. Pollock Co., San Francisco.

250 tons, 500,000-gallon tank and tower, Pasco, Wash.; Chicago Bridge & Iron Co., Chicago, low.

114 tons, bureau of supplies and accounts, navy department, delivery Washington; bids Sept. 7, schedule

1476.

Unstated tonnage, one to three twin-screw steam towboats for Inland Waterways Corp., New Orleans; Marletta Mfg. Co., Point Pleasant, W. Va., low for three boats at \$542,000; bids Aug. 18; alternate welded.

Unstated tonnage, 150,000-gallon water tank, Kennett Dam, Central Valley project, California; bids Aug. 31, bureau of reclamation, Denver.

Unstated, two 54-inch siphons, Bitter Root Irrigation district; bids at Hamilton, Mont., Sept. 7.

Unstated, penstock and discharge pipe, Succor Creek project; bids to bureau of reclamation, Boise, Idaho, Sept. 2. Unstated tonnage, 100,000-gallon elevated

tank, Hamilton park, Oswego, N. Y.; bids in.

Unstated tonnage, fifteen 48-foot welded steel dredge pontoons, U. S. engineer, Memphis, Tenn., bids Aug. 31.

Bars

Bar Prices, Page 68

Pittsburgh—Bar mill backlogs for both hot and cold-rolled bars have been only fairly well maintained by incoming specifications and now these are showing signs of further improvement. Agricultural implement activity continues a high rate of operations and implement makers are taking unusual tonnages with prospects of this obtaining well into the autumn. On the other hand the railroads have not been so active buyers of bars as in other years. Other manufacturers, however, are specifying liberally in small lots.

Cleveland—Little improvement in specifications for commercial carbon steel bars has been noted. Present demand is centered almost entirely around the agricultural trade as other miscellaneous users, particularly automobile-partsmakers have curtailed operations. Shipments can now be made within two weeks.

Chicago — Improvement in steel bar demand is confined principally to automotive orders, which were moderately heavier the past week. Sustained demand from the farm equipment industry and fair buying by miscellaneous users is providing a fair volume of business but has yet to increase sufficiently to offset shipments. A rising trend in automotive needs is in prospect for coming weeks.

Boston—Bar buying is sluggish and mostly in small lots, especially soft steel specifications. A mild improvement in forging and alloy bars is reported by some sellers, the latter for as quick delivery as possible. On the whole, however, there has been but slight change from the recent dull period. Bolt, nut and small tool activities are uneven, some being seasonally active, but not rushed. Two Rhode Island bolt and nut producers have booked slightly better orders, due in part to navy buying.

Philadelphia—Little interest is shown in bar requirements reported by miscellaneous consumers or the warehouse trade. Deliveries are available as early as ten days where specifications fit rolling schedules.

Local forge shops have just been awarded substantial orders for forgings by the navy department.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., builder of precision, boring, milling and drilling machines, reports unfilled orders



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GEARS AND SPEED REDUCERS
5112 HAMILTON AVE., CLEVELAND, O., U. S. A.



Aug. 15 valued at nearly \$1,000,000, sufficient to keep the plant operating at virtual capacity through March, 1938. New orders are being accepted subject to delivery after March 1.

Pipe

Pipe Prices, Page 69

New York—Cast pipe buying, confined now mostly to numerous small orders, will be stimulated soon by inquiries by New York city for several thousand tons. Westchester county is also expected to purchase heavily within the next few weeks, specifications being drawn for 3000 to 4000 tons. A New Jersey utility will be in the market shortly for close to 1000 tons. Gas utilities in this district are reducing use of cast iron and buying more steel pipe for replacements and extensions. By welding and use of special couplings, bends and curves are more easily fabricated.

Municipal water department, Newark, N. J., is considering purchase of 4000 feet of 48-inch pipe for installation from Belleville reservoir to the city limits. It is believed steel pipe will be bought. Further substantial water lines are in prospect for Newark.

Pittsburgh — While oil country goods continue to be the most active line in the current wrought pipe trade, standard merchant pipe is in fair demand. Building construction still lags and most lines of merchant pipe lag with it. Seamless tubing, especially, is in demand for oil well casing, etc., with mills still possessed of heavy backlogs due to these oil well requirements.

Cleveland—Most jobbers have noted little change in aggregate tonnage shipped out of stock compared with August. Mills are able to make deliveries almost overnight because of extensive stocks. Cast iron pipe awards are below those of this time a year ago, because of lack of government assistance in carrying out municipal expansion programs.

Chicago—Cast pipe demand continues slow and with passing of the period ordinarily most productive of new projects, producers anticipate continuation of a relatively dull market. Lack of a more substantial gain in building is restricting need for cast pipe installations. Smaller volume of federal spending compared with that of the preceding several years also is a factor in holding pipe sales at a rather low level.

Boston—Cast pipe buying, generally in small lots, is not heavy despite a slight gain in inquiry. Shipments

against previously booked tonnage are steady. Steel pipe buying shows signs of revival in spots with several larger heating and plumbing projects involved in buildings about to come out.

Buffalo — Carnegie-Illinois Steel Corp. is low bidder on 100 tons, 8-foot steel pipe for the outfall conduit of the Buffalo sewage disposal plant constituting division 14.

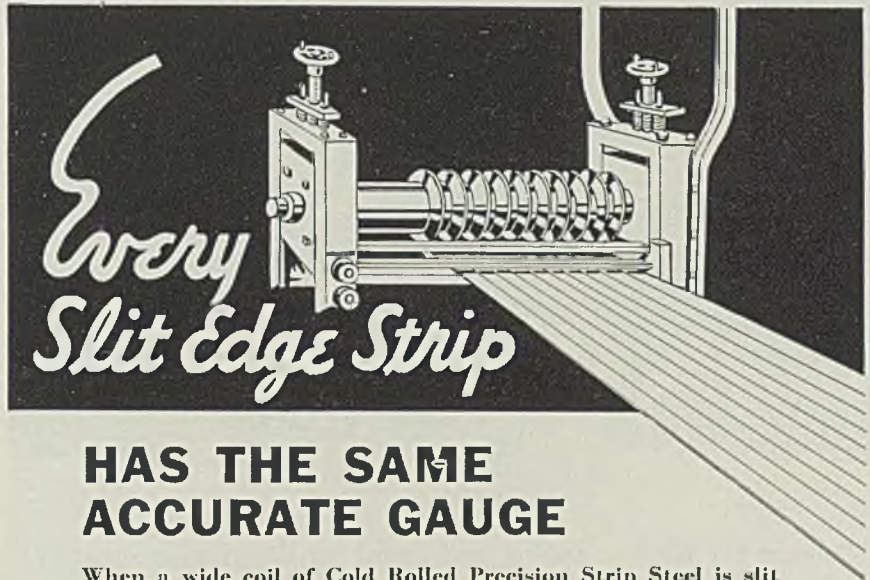
Seattle—Demand continues slow with no important projects up for figures and only small lots moving out of stock. Army engineers, Fort

Peck, Mont., opened bids Aug. 19 for 11,200 feet of various gages black pipe and fittings. Raymond, Wash., received tenders Aug. 23 for 3000 feet of 8 to 12-inch sewer pipe and fittings.

Cast Pipe Placed

650 tons, various sizes, water lines in connection with new manufacturing project, Ternstedt division, General Motors Corp., Trenton, N. J., to R. D. Wood & Co., Florence, N. J.

110 tons, 6-inch, navy delivery, New Orleans, to U. S. Pipe & Foundry Co., East Burlington, N. J.; bids July 13.



HAS THE SAME ACCURATE GAUGE

When a wide coil of Cold Rolled Precision Strip Steel is slit into many widths, the narrow strips will all be accurate to gauge and uniform, one with the other. The center strips will not be of heavier gauge than those at the edges because Cold Rolled Precision Strip Steel is accurate to gauge across the entire width. You are assured of uniform production, coil after coil.

Specify Cold Rolled Precision Strip Steel for all jobs where uniformity of gauge and uniformity of temper are important factors in your production. It is furnished in sizes as light as .001" in any carbon or alloy analysis and to the temper that meets your requirements.

The Cold Metal Process Co.

Youngstown, Ohio



Cast Pipe Pending

2200 tons, 6 and 8-inch specification X104, Los Angeles; bids opened.

153 tons, 4 and 6-inch cast iron or transite pipe, specification X105, Los Angeles; bids opened.

Tin Plate

Tin Plate Prices, Page 68

Pittsburgh—Tin mill operations continue at full capacity with continued heavy demand from mem-

bers of all lines of cans. The extraordinary tonnage requirements of can makers has been a continued surprise to tin mill managers but they look forward to a considerable easing off after the first frost. The present pack of small fruits and of the later vegetables is one of the heaviest in many years.

New York—Tin plate producers experience considerable pressure for shipments. Bids will be opened Sept. 20 by Edgewood, Md., arsenal on 53,616 sheets of coke tin plate. Export quotations generally contin-

ue on a parity with domestic. A recent exception is that a \$5.50, Pittsburgh, equivalent was quoted on a tonnage for shipment to Europe in December.

Transportation

Track Material Prices, Page 69

Placing of 800 fifty-ton hopper cars by the Cambria & Indiana, 500 going to Bethlehem Steel Co. and 300 to American Car & Foundry Co., brings total domestic freight car awards so far this year up to 48,480, and places bookings for the month to date at 1475, compared with 1130 for the entire month of July.

The recent flurry in buying of diesel locomotives continues with several further orders having been placed during the past week.

The railroads still delay placing rail orders and this week the Ensley, Ala., rail mill of the Tennessee Coal, Iron & Railroad Co. will go down, having been in continuous operation since last November, but it is expected to resume early next November. Meanwhile railroads are buying some supplementary track fastenings and a few plates and bars for current shop work.

Car Orders Placed

Cambria & Indiana, 500 hopper cars to Bethlehem Steel Co., Bethlehem, Pa., 300 hopper cars to American Car & Foundry Co., New York.

National Railways of Mexico, 325 40-ton box cars, to Iron & Steel Products Inc., Chicago.

Pennsylvania, one dining car, to Edward G. Budd Mfg. Co., Philadelphia.

Locomotives Placed

Atchison, Topeka & Santa Fe, nine diesel locomotives; six to Electro-Motive Corp., La Grange, Ill., two to American Locomotive Co., New York, and one to Baldwin Locomotive Works, Philadelphia.

Patapsco & Back Rivers, eight 600-horsepower diesel locomotives, six to American Locomotive Co., New York, and two to Electro-Motive Corp., La Grange, Ill.

Philadelphia, Bethlehem & New England, four 90-ton diesel locomotives, to Electro-Motive Corp., La Grange, Ill.

Steelton & Highspire, one 600-horsepower diesel locomotive, to Electro-Motive Corp., La Grange, Ill.

South Buffalo, six 600-horsepower diesel locomotives, to American Locomotive Co., New York.

Locomotives Pending

United States engineer, Fort Peck, Mont., one internal combustion type locomotive for Harlem, Mont., bids opened Aug. 27.

Its corrosion resistance is four to six times that of ordinary steels.

Complete laboratories insure efficient metallurgical and chemical control.

Design for Higher Speed and Build for Greater Endurance

"A.W."-"70-90" Super Strength Steel reduces weight with no loss of strength. It cuts dead weight as much as 40%. Or, putting it the other way, it just about doubles the strength without weight increase. "70-90" has the added qualities of increased corrosion resistance, fabrication facility by all the usual methods, and excellent welding properties. And its cost is low.

Write for literature and call on our Engineering Departments for competent collaboration.

"A.W."-"70-90" rendered 20 new New York City refuse trucks lighter and stronger.

"A.W."-"70-90" was here adopted to reduce weight without loss of strength.

ALAN WOOD STEEL CO.

CONSHOHOCKEN, PA.

Branches: Philadelphia, New York, Boston, Detroit, Los Angeles, San Francisco, Seattle, Houston

111 YEARS' IRON AND STEEL MAKING EXPERIENCE

Wire

Wire Prices, Page 69

Pittsburgh—Merchant drawn wire continues in only fair demand and nail trade activity is no greater than at any time during the summer. However, manufacturers' wire continues in heavy demand. Wire products prices have not changed since late March.

Cleveland—Producers report a slight improvement in specifications recently, and many believe this the start of the anticipated upward trend of fall activity. Jobbers are replenishing depleted stocks and nut, bolt and rivet manufacturers have slightly increased their requirements. However, new business continues to fall behind deliveries.

Chicago—Moderate improvement in wire demand is aided by slightly heavier buying for automotive use. Better activity in manufacturer's wire use among miscellaneous consumers appears assured during September. Outlook for heavier consumption of merchant wire products in farm districts is aided by favorable forecasts regarding agricultural income. Better buying is seen for drouth-affected districts. August business in wire and wire products will show a fair gain over July.

New York—For enclosing parks and playgrounds, New York city, 700 tons of 8-foot chain link fencing, steel posts and gates has been bought, contracts going to Cyclone Fence Co., New York, \$33,609; Wickwire-Spencer Steel Co., New York, \$13,423, and Vulcan Steel Products Co., Brooklyn, \$22,000. Wire buying is slightly heavier, the slight and somewhat spotty improvement which started about 10 days ago being maintained. There has been little advance buying, early delivery generally being specified. Orders tend to be slightly more numerous and larger.

Boston—Gradual improvement in wire buying continues spotty, but still well diversified. Specialties are slightly more active and a mild gain in orders for manufacturers' wire is noted. Several mills have booked attractive electrical cable orders. Backlogs are low on numerous specifications with mills in need of tonnage on others. Rod shipments are more prompt and some users are heavily stocked.

Metallurgical Coke

Coke Prices, Page 69

Beehive coke under contract continues to move out of the Connellsville regions in good volume, but demand for spot furnace and foundry

coke is off somewhat. Prices continue unchanged and steady since oven operators with an eye upon the shifting vagaries of demand are carefully gaging oven output to actual customer requirements. Thus they maintain a fairly steady balance.

Shipments of by-product foundry coke at Chicago are slightly heavier than a month ago, indicating mild betterment in foundry operations. A more substantial increase is seen for

September in view of a prospective upturn in production of automotive and miscellaneous castings. The market there is steady at \$10.25, ovens, for outside delivery and \$11, delivered Chicago.

Kearney & Trecker Corp., Milwaukee, manufacturer of milling machines, reports business running approximately 100 per cent ahead of a year ago. Substantial replacements of machinery are being made.

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● This display features coal,—black, lumpy coal in a setting of color and beauty. To see this display is to appreciate that here,—is coal that is different.

This selling message is put across, a story is told vividly,—and impressively. For your eyes can grasp a visual message quickly . . . Your customers and prospects will get your MESSAGE easily and promptly through a Beck & Wall display.

Let us tell you how we can build sales for you through displays,—for windows, exhibitions, shows, or your office lobby.



BECK and WALL • DISPLAYS

1800 EAST 30TH STREET
CLEVELAND OHIO

Unit Steel Bids to Connecticut State Highway Department

Grade crossing elimination, Hartford-Willimantic turnpike, route U. S. 6-A, town of Windham, Aug. 2

Material	Unit	A	B	C	Lowest Total
Steel bearing piles, lbs.	1,108,641	\$0.03	\$0.028	\$0.03	\$31,041.95
Structural steel, lbs.	812,900	0.057	0.065	0.066	46,335.30
Deformed steel bars, lbs.	296,641	0.04	0.04	0.04	11,865.64
Steel sheet piling, lbs.	190,000	0.03	0.02	0.035	3,800.00
Wire rope railing, lin. ft.	3,972	0.40	0.40	0.40	1,588.80

A—M. A. Gammino Construction Co., Providence, R. I., low and contract at \$248,527.31; B—A. I. Savin Construction Co., East Hartford, Conn., second, \$261,144.41; C—V. Barletta Co., Boston, third, \$272,842.15.

Structural steel awarded American Bridge Co., Pittsburgh; steel bearing piles, Carnegie-Illinois Steel Co., Pittsburgh; reinforcing steel, Concrete Steel Co., New York.

Shapes

Structural Shape Prices, Page 68

New York—Inquiry for structural steel has declined, new work coming out for bids taking small tonnage. While a fair number of projects are being figured, the aggregate tonnage is not impressive.

Shipments of fabricated structural steel and bookings during July were in excess of the average for the current year, according to the American Institute of Steel Construction. Shipments were 61.8 per cent of the 1928-1931 average, against a monthly average this year of 56.5 per cent. Bookings were 68.8 per cent of normal capacity as against a monthly average this year of 66 per cent. Totals were: Shipments 144,560 tons and bookings 160,970 tons.

Boston—Bridge contracts account for bulk of awards, the aggregate tonnage being lower, with close to 600 tons bid or being figured. Harvard University, Cambridge, Mass., will erect a new Hemenway gymnasium and a public administration school, architects now drawing plans. Boston district shops are beginning to fill up with work and are releasing heavier tonnages of plain material.

Philadelphia — Number of new structural jobs has dropped sharply and fabricating shops are somewhat apprehensive about maintaining present operations. Considerable state work remains ahead, but probably will not be active for several more weeks. A few industrial jobs have been noted, but generally this type of work is disappointing.

Buffalo—A. S. Wickstrom, Bound Brook, N. J., is low bidder on the Pennsylvania railroad viaduct, Montour Falls, N. Y., involving 450 tons of structural steel.

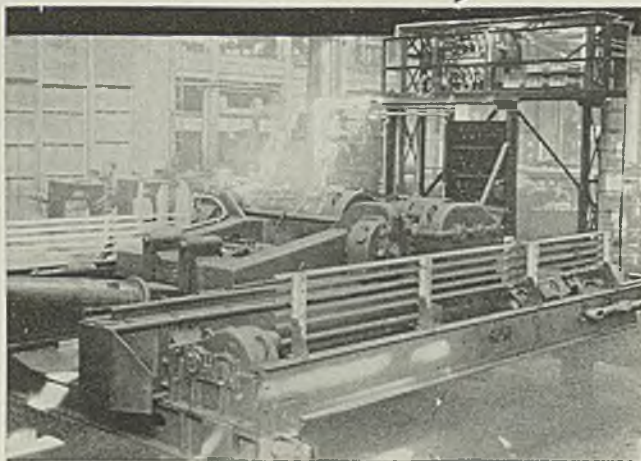
Pittsburgh — The largest award

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WELLMAN PRODUCTS INCLUDE:

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- Ship Unloaders.
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- Car Dumpers, all types.
- Blast Furnace Skip Hoists.
- Gas Producers, Flues and Fuel Feeds.
- Wellman-Galusha Clean Gas Generators.
- Gas Reversing Valves.
- Furnace Charging Equipment.
- Open Hearth Furnaces.
- Steel Works Equipment.
- Safety Stops for Travelling Structures.
- Welded Steel Construction.

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● Specialists in material handling equipment for more than three score years, we offer you creative engineering that masters the toughest problem economically.

THE WELLMAN ENGINEERING CO.
ENGINEERS CONSTRUCTORS MANUFACTURERS
CLEVELAND, OHIO
BIRMINGHAM NEW YORK MEXICO CITY

Shape Awards Compared

	Tons
Week ended Aug. 27	25,878
Week ended Aug. 21	24,660
Week ended Aug. 14	23,454
This week, 1936	30,731
Weekly average, 1936	16,332
Weekly average, 1937	25,835
Weekly average, July	23,381
Total to date, 1936	806,627
Total to date, 1937	904,239

Includes awards of 100 tons or more.

of the past week went to American Bridge Co., Pittsburgh, 4900 tons, for the bridge over the St. Clair river, Port Huron, Mich., to Point Edward, Ont.

Cleveland—Awards during the last week have improved somewhat, but have accomplished little in replacing the dwindling backlogs on most mill books. Feature of the market is the 1000-ton award to Bethlehem Steel Co., Bethlehem, Pa., for factory building, Toledo, O., for Libbey Glass Co. Pending work continues to appear in fair tonnage.

Chicago — Most inquiries are small, about 12,000 tons of new business being involved in individual jobs of less than 100 tons. Producers usually are able to make delivery of plain material within three to four weeks.

San Francisco—Number of small structural awards have been placed but total did not exceed 1500 tons. To date this year 119,280 tons have been booked as compared with 128,234 tons in 1936.

Seattle—Interest centers in openings at Bonneville involving in excess of 1000 tons of shapes and machinery. No awards have been announced. Pacific Car & Foundry Co., Seattle, is apparently low at \$147,598, f.o.b. job, for fishway gates, stoplogs, etc. Consolidated Steel Corp., Los Angeles, offered \$147,324, f.o.b. plant. In this project about 600 tons are involved.

Shape Contracts Placed

4740 tons, bridge, St. Clair river, Port Huron, Mich.-Ontario, Canada, to American Bridge Co., Pittsburgh.

4500 tons, 16-story bank and office building, Florida National Building Corp., Miami, Fla., to Virginia Bridge Co., Roanoke, Va.; George A. Fuller Co., New York, general contractor.

4000 tons, spillway gates, Pickwick Landing, Guntersville and Chickamauga dams, Tennessee valley authority, Knoxville, Tenn., to Dravo Corp., Pittsburgh; bids July 29.

1010 tons, New York City exhibition building, Worlds Fair, New York, to Lehigh Structural Steel Co., Allentown, Pa.; through Psaty & Fuhrman Inc., New York, general contractor.

1000 tons, factory building and bridge, Libbey Glass Co., Toledo, O., to Bethlehem Steel Corp., Bethlehem, Pa.

655 tons, addition, Waller high school, Chicago, to A. F. Anderson Iron Works, Chicago.

620 tons, bridges, FAP 177-B, Kiowa county, and WPGM 526-A, Oklahoma City, Oklahoma, to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

585 tons, building, Third National Bank, Nashville, Tenn., to Vincennes Steel Corp., Vincennes, Ind.

525 tons, bridge superstructures, Big Bear creek, Little Bear creek and Dry creek, Pickwick Dam, Tennessee Valley Authority, Knoxville, Tenn., to Bethlehem Steel Corp., Bethlehem, Pa.

500 tons, bureau of supplies and accounts, navy department, delivery various yards to Phoenix Iron Co., Phoenixville, Pa., and Carnegie-Illi-

nois Steel Corp., Pittsburgh; awarded Aug. 9.

480 tons, Ohio river station addition Southern Indiana Gas & Electric Co., Evansville, Ind., to Milwaukee Bridge Co., Milwaukee.

480 tons, public school No. 140, Board of Education, Queens, N. Y. to Lehigh Structural Steel Co., Allentown, Pa.

340 tons, press and warehouse building, 1900 Corporation, St. Joe, Michigan to Jos. T. Ryerson & Son Inc., Chicago.

340 tons, engine facilities buildings, Pennsylvania railroad, Harrisburg, Pa. to Fort Pitt Bridge Works, Pittsburgh.

325 tons, two river crossing towers, Norfolk, Va., to Lehigh Structural Steel Co., Allentown, Pa.

300 tons, bridge, Fort Edward, N. Y., state department public works, to Phoenix Bridge Co., Philadelphia; S. A. Scullen Inc., Cohoes, N. Y., general contractor.

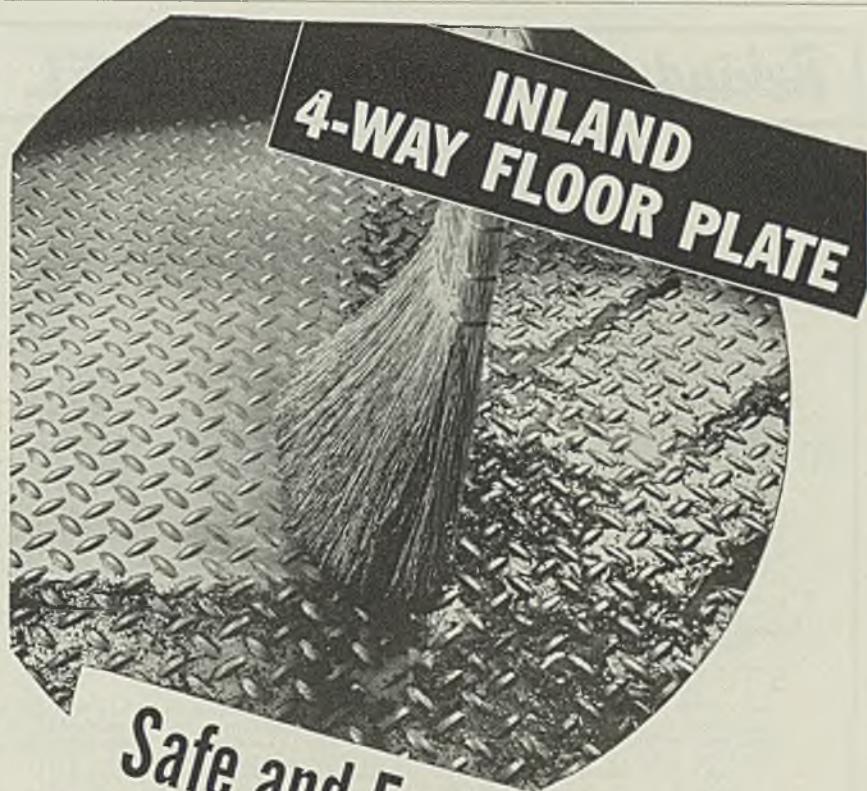
300 tons, factory building, Tropic Aire, Inc., Chicago, Ill. to Wendnagel & Co., Chicago.

300 tons, city dumping platform and ramp, Brooklyn, N. Y. to Harris Structural Steel Co., New York.

300 tons, pressed glass building, General Electric Co., Niles, O., to Niles Forge Co., Niles, O.

300 tons, state highway bridge, Howell, Mich., to R. C. Mahon Co., Detroit.

290 tons, Exchange building, Pennsylvania Telephone Co., Johnstown, Pa. to Grif-



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5th-Custer Steel Co., Johnstown, Pa.
275 tons, Silver Spring housing project, Washington, D. C., to Rossllyn Steel & Cement Co., Rossllyn, Va.
275 tons, state highway bridge WPGM 201, Greenup county, Kentucky, to Midland Structural Steel Co., Cicero, Ill.
270 tons, under-crossing, Ontario, Malheur county, Oregon, to unnamed interest.
250 tons, material for armory building, St. Louis, Mo., to Bethlehem Steel Corp., Bethlehem, Pa., and Superior Structural Steel Co., St. Louis.
250 tons, piling, outfall sewer section, division 14, Buffalo, to Carnegie-Illinois Steel Corp., Pittsburgh.
240 tons, state Arch bridges, Colrain-Charlemont-Shelbourne, Mass., to Bos-

ton Bridge Works, Boston.
229 tons, including 77 tons sheet piling, bridge in Kiowa county, Colorado, to unnamed interest.
210 tons, highway bridge, for the City of Scranton, Pa. to American Bridge Co., Pittsburgh.
200 tons, press shop, E. G. Budd Mfg. Co., Philadelphia, to Robinson Iron & Steel Co., Philadelphia.
185 tons, alterations, Union avenue bridge, Portland, Oreg., to unnamed interest.
170 tons, bridge, project 54-C, Buena Vista, Chafee county, Colorado, to unnamed interest.
160 tons, bridge, Hamden, Conn., to New England Iron Works, Hamden, sub-

let to Phoenix Bridge Co., Philadelphia.
160 tons, state highway project WPGH-2597, Chatham county, Georgia, to Taylor Iron Works & Supply Co., Macon, Ga.
142 tons, five gates, metropolitan water district, Los Angeles, specification 220, to unnamed interest.
140 tons, I-beam overpass, Newbury, Vt., to Vermont Structural Steel Co., Burlington, Vt.; Ryan & Densmore, Claremont, N. H., general contractors; bids Aug. 13, H. E. Sargent, commissioner of highways, Montpelier. Project also takes 70 tons reinforcing bars.
135 tons, warehouse, Lancaster, Pa., to A. B. Rote Co., Lancaster, Pa.
132 tons, sheet piling, bulk head, Newport Beach, Calif., to unnamed interest.
130 tons, bridge superstructure, Farmington, Me., to Pittsburgh-Des Moines Steel Co., Pittsburgh, \$18,641.40; bids Aug. 25.
125 tons, furnace steel, Detroit, to Whitehead & Kales, Detroit.
110 tons, piling, bulkhead, Ithaca, N. Y., to Bethlehem Steel Corp., Bethlehem, Pa.
100 tons, angles, bureau of supplies and accounts, navy department, delivery various yards, to Ross Galvanizing Works, Brooklyn, N. Y.
100 tons, addition to plant, Rheem Manufacturing Co., South Gate, Calif., to unnamed interest.

Behind the Scenes with STEEL

Periscope

IN ORDER to look over the top of this week's book and see what is to come, we are presenting on page 57 a periscope's-eye-view of our newest author, Mr. H. C. Be-Ment, who will commence a description in next week's book of research and experiment in the direction of direct rolling of strip. Makes us wonder not a little bit about the future of this process. Lots of things and stuff will gradually become obsolete if this process should be developed commercially. Better tie a 2-inch manila rope around your little finger so you will be sure not to miss this series and see for yourself the state of the art, and how far it has progressed.

Coming

STILL peering into the future, we note that with this issue summer comes to its end and with it vacations, et al. Next week begins the serious business of fall, with the Sept. 6 issue. Not far away is the issue of Sept. 20 with the annual insert dedicated to the meeting of the Iron and Steel Engineers. This year's fracas will be in Chicago's Hotel Sherman. STEEL will be there, of course, amply covering the show and sessions for those of you not able to be there, but for the ones who are going, the issue of Sept. 20 will bring all advance information. Don't miss it.

More Ore

WE READ on page 17 of this issue that more ore than ever before may be shipped this year. Immediately we rushed to our window to inspect the red mountains on the lakefront far below our windows. We fully expected the stuff to eclipse our view of Erie's whitecaps and a few red sails here and there in the sunset, but it was not so. We have been patiently watching the pile with binoculars and the darned thing hasn't grown at all. We've watched boatload after boatload of ore being unloaded, but it all falls in freight cars and is whipped up the creek where we can no longer see it. Someday we'll probably dis-

cover there is a blast furnace or two around somewhere on the creek behind the building next door and the mystery of the non-growing ore pile will cease.

Foto

INTRIGUED were we with the idea of presenting an industrial story in pictures, in much the same way as some of our more general contemporaries. So when the opportunity presented itself, our editors took it in hand with the results shown on page 40 and following. Like the idea? If so, we shall attempt to present the same type articles from time to time. Orchids in this case are due to the fine photographic work done in the plants of International Harvester.

Pinnacle

PEAK of something or other has been reached in a recent release from the Division of Simplified Practice, National Bureau of Standards. Entitled Simplified Practice Recommendation R168-37, this noble work states in no uncertain terms that if a 27-inch shoelace is to be regarded as standard, it should be 27 inches long. It has been rumored throughout the shoelace trade that certain unethical manufacturers were making 27-inch shoelaces anywhere from 26 to 28 inches long. Our favorite panhandler, who carries three shoelaces as a front, is contemplating a blacklist to contain the names of all unstandardized brands. The Shoe Lace Institute has also let it be known that it will gladly furnish information on how to measure shoelaces to any executive who requests same on his business letterhead.

Sexcess

ALONG with our current campaign for more sex in industrial advertising comes the Harris Calorific Co., whose beautiful layout on page 27 illustrates how to advertise welding torches in a roundabout manner, with effectivity.

—SHIRDLU

Shape Contracts Pending

3000 tons, vladuct, Rikers Island-North Beach, N. Y.
650 tons, car dumper, Pennsylvania railroad, Sandusky, Ohio.
600 tons, fishway gates, trash racks, etc., Bonneville dam; Pacific Car & Foundry Co., Seattle, apparently low.
400 tons, warehouse building, Owens-Illinois Glass Co., Newark, Ohio.
371 tons, mesh and bars, mostly former, 14,752.28-foot section, Merritt parkway, Stamford and Greenwich, Conn.; New Haven Road Construction Co., New Haven, Conn., low, \$235,444.07, bids Aug. 16.
370 tons, beam framing, in new press shop, Fisher Body division, General Motors Corp., Flint, Mich.
340 tons, apartment building, Hymen & Mike Cohen, Charleston, W. Va.
300 tons, addition, public school No. 26, Bronx, N. Y.
280 tons, building, Carr-Lowrey Glass Co., Baltimore.
250 tons, garage and laboratory building extensions, Electric Illuminating Co., Cleveland, Ohio.
250 tons, building alterations, Interzone Corp., New York.
240 tons, post office building, U. S. government, West New York, N. Y.
232 tons, Yantic river bridge and approaches, Norwich-Colchester road, route 2, Norwich, Conn.; A. I. Savin Construction Co., East Hartford, Conn., low, bids Aug. 16, \$36,848.38. Tonnage includes 110 tons, steel bearing piles; 79 tons, structural steel, and 43 tons, reinforcing bars.
200 tons, bridge, Bladensburg road, N. E., Washington; Diamond Construction Co., Washington, apparent low bidder at \$76,484.84; bids Aug. 20 with district commissioners.
200 tons, shapes and bars, state highway bridges, Clarendon, Woodstock, East Dummerston and Alburg, Vt., H. E. Sargent, commissioner of highways, Montpelier, Vt.
200 tons, postoffice, Evanston, Ill.; bids Sept. 17.
150 tons, postoffice, Miami Beach, Fla.;

A. Farnell Blair, Lake Charles, La., low, bids Aug. 26.
 115 tons, shapes and bars, highway project, Thomaston-East Morris road, Litchfield and Morris, Conn.; C. W. Blakeslee & Son, low; bids Aug. 16, \$42,982.36.
 100 tons, school, Chaumont, Jefferson county, New York.
 100 tons, postoffice, Muskegon, Mich.; bids Aug. 31.
 Unstated tonnage, radio antenna towers, department of commerce, Washington, Blaw-Knox Co., Pittsburgh, low, \$886 each; bids Aug. 12.

Prices are frequently shaded on larger transactions.

Philadelphia—Slight improvement in new business is reported, but consists mostly of small industrial and store jobs. Aggregate volume still low as reflected in keen competition on price basis. Pending work includes 650 tons for the Lit Brothers department store, Philadelphia.

San Francisco—Awards were largest of any week this year and totaled 7861 tons. This brought the aggregate to date to 66,619 tons, compared with 167,481 tons a year ago.

Interest now centers in the outcome of the award for 1504 tons for a viaduct for the San Francisco terminal of the San Francisco-Oakland bridge, on which Eaton & Smith received the general contract at \$605,350.

Seattle—Construction projects involving less than 100 tons each are furnishing local mills with a fair volume of business. There is nothing outstanding in the situation and no large tonnages are in sight. Several sizable lots involved in Washington state highway jobs are pending.

Reinforcing

Reinforcing Bar Prices, Page 69

Pittsburgh—Activity in reinforcing bars has simmered down to a few tonnage lots and new projects are rather of limited individual tonnages and few in number.

New York—Reinforcing buying has declined, most of the larger projects having been placed. New active inquiry is down with a substantial tonnage expected out for world's fair work shortly. On the heavier lots prices are frequently shaded.

Cleveland—Reinforcing awards are limited to small projects from private sources. Aggregate tonnage placed so far this month is considerably below the corresponding period during July. Pending work is also confined to small jobs. Prices remain spotty.

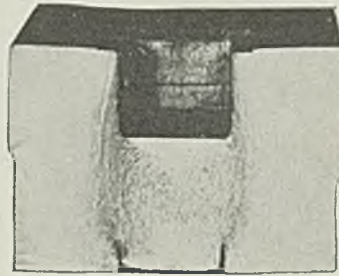
Chicago—Reinforcing bar distributors have a fair number of projects to figure but awards lack improvement and shipments are moderately smaller. Pending work includes 800 tons for the Wesley Memorial hospital.

Boston—For Connecticut highways and bridges, reinforcing requirements are outstanding, more than 600 tons pending while 500 tons are being figured for the engineering building, Northeastern university, Boston, closing this week. Because of recent substantial buying, active tonnage is slightly lower, although small-lot inquiries are numerous.

Concrete Awards Compared

	Tons
Week ended Aug. 27.....	2,458
Week ended Aug. 21.....	14,094
Week ended Aug. 14.....	14,116
This week, 1936.....	7,302
Weekly average, 1936.....	6,005
Weekly average, 1937.....	6,239
Weekly average, July.....	6,919
Total to date, 1936.....	250,195
Total to date, 1937.....	218,351

Includes awards of 100 tons or more.



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 ... High Finish*

JESSOP PRESS E-Z HOBGING STEEL

The requisites of an ideal Steel for most die sinking purposes are found in Jessop Press E-Z, a low carbon electric furnace Hobbing Steel.

Of utmost importance, ease in sinking, control of grain size, and the ability to take a high finish are combined in Press E-Z.

Makers of

High-Grade Carbon, Alloy, Stainless and Composite Steels

JESSOP STEEL COMPANY

(OF AMERICA)

GENERAL OFFICE AND WORKS, WASHINGTON, PA.

Branches or Agents in all principal cities

Reinforcing Steel Awards

- 300 tons, mesh and bars, manufacturing plant, Ternstedt division, General Motors Corp., Trenton, N. J.; John McShain, Philadelphia, general contractor.
- 300 tons, Chrysler Motors, Detroit, to Truscon Steel Co., Youngstown, O.
- 265 tons, plant addition, Albert Schwill & Co., South Chicago, Ill., to Olney J. Dean Steel Co., Chicago.
- 260 tons, reinforcing trusses, New Jersey approach, Lincoln tunnel, Weehawken, N. J.-Manhattan, N. Y., to Jones & Laughlin Steel Corp., Long Island City, N. Y.; George M. Brewster & Son Inc., Bogota, N. J., general contractor. Same fabricator also awarded 70 tons, southerly section, Flushing river bridge.
- 240 tons, Big Creek bridge, Monterey county, California, to Consolidated Steel Corp., Los Angeles.
- 238 tons, sewers, Avenue M and Ralph avenue, Brooklyn, N. Y., to Capitol Steel Co., Brooklyn; Charles Bennett Improvement Co., Brooklyn, general contractor.
- 235 tons, Tennessee valley authority, Knoxville, Tenn., to Truscon Steel Co., Youngstown, O.
- 185 tons, department of interior, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- 175 tons, treasury department, invitation 30,281, for delivery Compton, Calif., to Soule Steel Co., Los Angeles.
- 160 tons, sewer, 129th street, Queens, N. Y., to Carroll & McCready Co. Inc., Brooklyn, N. Y.; through Delise Construction Co., Ozone Park, N. Y.
- 100 tons, state bridges, Duxbury and Newbury, Vt., to Truscon Steel Co.,

Youngstown, O.; through Ryan & Densmore, Claremont, N. H., general contractors.

Reinforcing Steel Pending

- 1504 tons, viaduct, San Francisco terminal, San Francisco-Oakland bridge; general contract to Eaton & Smith, San Francisco, at \$605,350.
- 800 tons, Wesley Memorial hospital, Chicago.
- 500 tons, engineering building, Northeastern University, Boston.
- 390 tons, Richmond-Sunset sewage treatment plant, San Francisco; Clinton Construction Co., San Francisco, low at \$262,500.
- 375 tons, toll booths and administration building, Henry Hudson bridge, New York.
- 250 tons, state prison, Oldham, Ky.
- 225 tons, International Harvester Co., Indianapolis.
- 198 tons, garage, department of sanitation, New York, Bergen Landing, Queens, N. Y.; bids Sept. 3.
- 150 tons, sewer system, Bonneville dam, Oreg.; bids Sept. 17.
- 130 tons, sludge disposal building superstructure, Stickney, Ill., for Chicago sanitary district; bids Sept. 2.
- 125 tons, water reservoir, Park Ridge, Ill.
- 110 tons, bureau of reclamation, Denver; bids in.
- 100 tons, reinforced concrete rigid frame bridges, East Rocks road and Gruman avenue, Norwalk, Conn.; New Haven Road Construction Co., New Haven, Conn., low, two contracts; bids Aug. 16.
- 100 tons, state bridge, Franklin county, Idaho; bids at Boise, Idaho, Sept. 3.

Pig Iron

Pig Iron Prices, Page 70

New York—Although better than normal for this season pig iron shipments continue light with sellers expecting little change until after Labor Day. Failure of building to live up to early expectations this season is reflected in pig iron specifications from manufacturers of heaters and soil pipe, business in this direction being disappointing.

Some contracting is noted for fourth quarter, with possibility of an advance later having some influence. However, the attitude of buyers is that producers will give some last-minute warning should such increase be definitely in sight. Meanwhile, export demand continues at the light volume prevailing since late June.

Eastern pig iron producers have enough tonnage on books to keep busy until Jan. 1, making allowances for such specifications as regular customers reasonably may be expected to make for the last period. Booked to this extent, most producers are making little or no effort to establish new accounts.

Pittsburgh—Shipments from furnaces continue steady but new business is coming forward rather slowly. With fourth quarter price now generally known, consumers are not feeling the urge to place new business. Foundry operations continue at a fairly steady rate which involves consumption of considerable pig iron on hand. There is promise of somewhat further expansion in export business in pig iron but this may not become definite for several weeks.

Cleveland—Only a slight improvement in specifications is reported by producers, since books for fourth quarter were opened two weeks ago. Most foundries, with the possible exception of those serving the farming trade, have felt the influence of seasonal conditions; and in most instances are in no hurry to contract ahead. Most sellers anticipate a general improvement in sales and shipments soon.

Chicago—Substantial bookings have accumulated since prices were extended. Producers now appear assured of continuation of steady shipments into next period. August deliveries are expected to approximate those of July and with foundry operations tending upward, a gain in consumption is seen for September. Producers of automotive castings are slightly busier and the outlook is more favorable. The market is firm at \$24, furnace, for No. 2 foundry and malleable.

Boston—Pig iron buying is light, and, while some fourth quarter ton-

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nage is being booked the volume is not large. Shipments against present quarter contracts are substantial and some melters will have taken their full tonnage by mid-September. Considerable quiet negotiations for additional export business is being done with 300 tons going to Sweden last week. Several sellers are not closing the door entirely on a possible price increase later in the year.

Philadelphia—Sellers report additional incoming business of fourth quarter in lots of 200 to 300 tons but consumers have not rushed to cover for this period despite continued intimations that higher prices are inevitable before the end of the year. In fact, some consumers have asked producers to delay shipment until fourth quarter on iron scheduled for third quarter. Furnace stocks are reported moderate and any appearance of renewed foreign interest is expected to bolster the possibility of a price rise.

Buffalo—With most customers having complete purchases for fourth quarter quiet prevails. Shipments have been less than expected but improvement later is anticipated. Foundries are only moderately active.

Cincinnati—Shipments of northern and southern pig iron have slowed from July levels. Some important foundries have drastically curtailed schedules, possibly until Labor Day. The market, however, has been fairly active with coverage for fourth quarter needs. Demand for castings for stoves is relatively heavier than in jobbing and machine tool foundries.

St. Louis—Buying is in fair volume, mostly small orders for spot delivery. Shipments so far this month are slightly ahead of July, and the largest for any August since the predepression era. Melt is strong, and has picked up during past week. Tri-City area jobbing plants, which are enjoying overflow orders from the implement industry, are running from five to six days per week. Stove foundries are also on high schedules. These plants have heavy shipments, in some instances the highest on record. Jobbing plants specializing in automotive castings report business below expectations, but improvement is looked for soon.

Toronto, Ont.—Business continues to improve in merchant pig iron market. General improvement early next month is indicated. Daily melt is holding around 60 to 65 per cent. Melters are interested in spot needs only, and while no forward delivery contracts have been placed recently, those covered for third quarter are taking scheduled delivery. Foundry iron is the most active with turnover last week totaling about 1000

tons, while malleable ran about 500 tons. Basic iron is moving in a spot-y manner. Prices are firm and unchanged.

Scrap

Scrap Prices, Page 72

Pittsburgh—An unexpected change since last Tuesday has developed at least sentimentally in the Pittsburgh scrap trade, resulting in some weakening of the market that awaits confirmation by report of the first actual sales. This, too, in face of the price mark-up in a couple of grades. Last Tuesday there came an announcement from the United States Steel Corp. that all scrap shipments had been embargoed for at least a week to a number of its important open hearth plants in this district. So far as known no independents have followed, but the known sentiment among scrap buyers here has been that prices are too high. With the closing of three important railroad lists within the next few days, it is expected that a more definite line on scrap prices will be obtained. Meanwhile, scrap quotations here remain nominal.

Cleveland—Sentiment is divided as to prices of steel and iron scrap, some believing weakness is likely to show, while others feel the market is strong at bottom and higher prices are imminent. Closing of railroad lists now offered will show the real condition. The Pennsylvania closes Sept. 1 on 22,000 tons, including 8000 tons of heavy melting steel. Baltimore & Ohio closes Aug. 30 on 14,000 tons, including 2000 tons each of cast car wheels and rails. Shipments are being taken more freely by plants in the Valley.

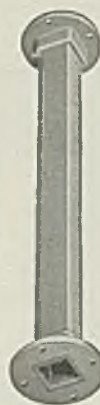
Chicago—Scrap continues quiet and a weaker tone is apparent in bids by dealers and brokers at 50 cents to \$1 a ton below the level prevailing some weeks ago. Mills continue out of the market and shipments against contracts are being regulated. Offerings are not excessive, however, with only moderate tonnages involved in recent railroad lists.

Boston—Without material weakness, scrap prices are slightly more mixed, depending on the ultimate point of consumption. Heavy melting steel for export is strong, \$18.50, dock, being paid for No. 1 with this price slightly bettered in a few instances. A moderately improved demand for cast for New England

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foundries has firmed textile and No. 1 machinery cast, a movement not shared by breakable. Several other grades for domestic consumption, notably borings and turnings for outside shipment tend to be a trifle easier. Steel-making grades for New England delivery, however, are steady.

New York—An easier tone with light buying and some Pennsylvania mills holding up shipments has resulted in lower bids on heavy melting steel for both domestic and export delivery. These grades are off 50 cents as are heavy breakable cast for domestic shipment and No. 2 cast and compressed sheets for export. Most buying continues for foreign account with material being loaded steadily, without accumulations.

Philadelphia—The scrap market generally is marking time in view of the fact that mills continue to stay out of the market in anticipation of possible price recession. A leading consumer is not buying for two points and is paying 50 cents less at \$18.50 to \$19 for a third consuming point, the minimum applying to local material. Scrap interests report little material available from yard dealers and see little possibility of a weaker market unless new steel buying fails to develop as anticipated.

Buffalo—The leading consumer of scrap has purchased approximately 25,000 tons of No. 1 heavy melting steel and allied grades, paying between \$20.00 and \$20.50 for No. 1 and a \$2 differential on No. 2 heavy melting steel, No. 1 busheling, hy-

draulic compressed sheets and drop forge flashings. While a strong tone continued to dominate the local market, no other buying activity is apparent and some dealers are inclined to believe the market may ease further.

Detroit—The market, if anything, is a trifle easier, although prices are holding firm in view of reduction in supplies occasioned by most automobile plants now being closed down for changeover to new models.

Weakness is noted particularly in blast furnace scrap, which moved up sharply about a month ago in face of strong demand. Borings and turnings are quoted at \$13.50 to \$14, although there is some pressure on this figure.

Cincinnati—Lack of interest in iron and steel scrap in this district brought a softening of prices after the steady upward climb. Some covering on orders was done at 50 cents under quotations but the level generally held as dealers looked to greater business activity next month as a bullish factor. Temporary suspension of shipments to a Youngstown interest had a depressing effect on sentiment.

St. Louis—The market for iron and steel scrap continues firm, but the advance has been checked and buying activity has subsided. Dealer offerings have expanded noticeably, and as a result there has been a considerable reduction in the short interest, which at mid-August was large. There has been a noticeable decline in inquiry from Chicago and other eastern centers and the out-

bound movement during the past week or ten days has been negligible.

Seattle—In the absence of active sales No. 1 heavy melting is quoted at \$7 to \$8 net ton, \$12 for rails. Steamship lines are asking \$10 freight for scrap and \$8 for rails but no new business is being booked. The disturbance in the Orient has restricted placing of new orders, Japanese buyers also being hampered by exchange restrictions and some consignees having asked delay of shipments. Local mills are out of the market, turnover being limited to small demand by foundries. Stocks at tidewater are heavy.

Toronto, Ont.—Interest is increasing in iron and steel scrap and consumers are inquiring for both grades. Mills are taking all the heavy melting steel offered and dealers are drawing heavily on yard holdings to meet demands. Machinery cast is in strong demand and some dealers state they are unable to fill orders while others are not taking contracts for cast scrap. Stove plate is steady but supplies are limited. It is predicted in some quarters that there may be a scarcity of steel scrap soon, and consumers of iron grades already are feeling the pinch. Prices are firming with higher levels in prospect.

Warehouse

Warehouse Prices, Page 71

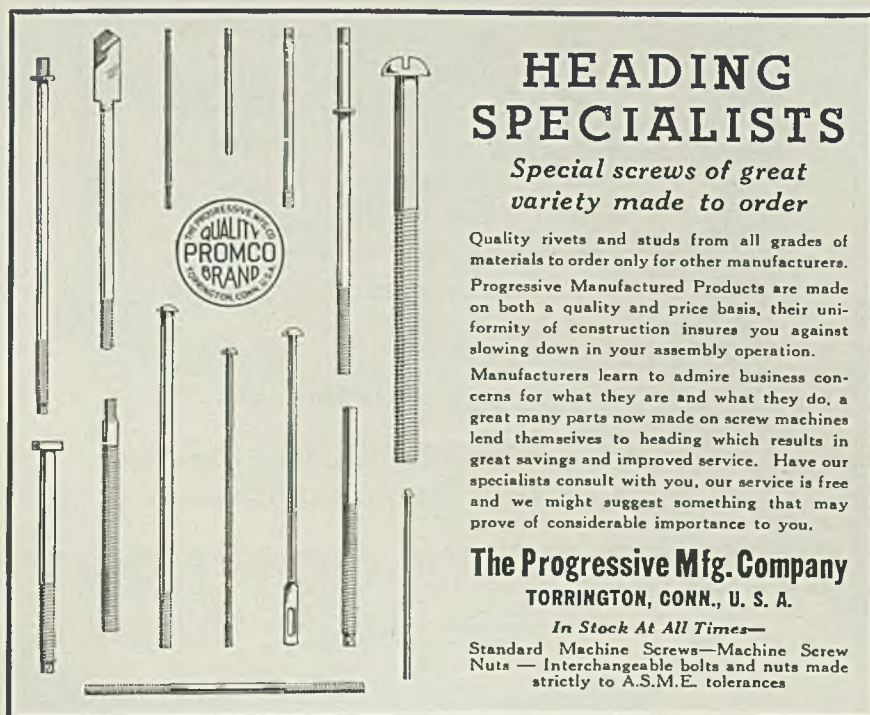
Cleveland—Shipments out of warehouse have improved slightly since the first of the month, although certain grades of sheets and plates have resisted seasonal influences better than anticipated.

Chicago—While August sales show some decrease from July, the recession is moderate and entirely seasonal. Trend in demand points to the customary recovery early in fourth quarter. Prices are steady.

Boston—Warehouses have reduced diamond floor plates to 5.58c, base price for 10,000-pound orders, 30 cents per 100 pounds lower. This applies to plates one-eighth inch or more in thickness, lighter gages being unchanged. Jobber reports on current volume differ, some doing a fair business on a few products while others experience dullness throughout the list.

New York—Buying is slow in all products with upturn expected after Labor Day. Improved deliveries to warehouses have resulted in better balanced stocks.

Philadelphia—Further decline in total sales from stock are reported though billings show favorably due to higher prices. Better mill de-



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steadily lower, closing at 13.80c, c.i.f. European ports. Domestic producers held quotations firm at 14.00c, Connecticut, with sales averaging around 1600 tons daily.

Zinc—Limited offerings continued to restrict the volume of new business. Prime western zinc held at 7.25c, East St. Louis. Producers are concerned chiefly with shipping details.

Lead—Prices remained firm on the basis of 6.35c, East St. Louis. Consumers showed only moderate buying interest in view of their well cov-

ered position on nearby requirements. Production facilities are being increased in order to insure consumers of adequate supplies. At the end of July, stocks were reported 2267 tons lower at 111,103 tons.

Tin — Straits tin prices sagged with spot closing at 58.05c. Consumers showed a slight increase in buying interest at the lower levels. Hostilities in the Far East have not had any effect so far on the Chinese tin mining or shipping industries.

Antimony—Prices held unchanged at 15.25c for American spot and 15.50c for Chinese spot. Offerings of the latter grade were very limited since shipments from China may be impeded by future war developments.

Mirrors of Motordom

(Concluded from Page 26)

duragold, an aluminum alloy containing varying amounts of tin, aluminum, copper and nickel. Changes in analysis and heat treatment permit hardnesses up to 300 brinell.

Only a few years ago, much importance was made of a new cadmium-silver alloy for automobile bearings. But with cadmium now selling at nearly \$1.80 per pound, its use in bearings has practically disappeared, with the exception of Ford. The latter uses large quantities of cadmium-nickel alloy for connecting rod bearings, and would give plenty to discover a less expensive material which would provide equal performance.

Steel-backed babbitt bearings have become practically standard with all other makes of cars, although there is some variation in the babbitt analysis and the method of manufacture. Copper-lead bearings are used to some extent by General Motors Truck and Packard, while Graham uses cadmium-nickel connecting rod bearings on its supercharged models.

Tungsten Affected by Sino-Jap Conflict

(Concluded from Page 17)

rial," that is, an essential material from which the country might be cut off in time of war.

Of the tungsten consumed in this country, about 90 per cent is used by the steel industry. It is estimated that perhaps as high as 75 per cent goes into the manufacture of high-speed steel. Another 15 per cent goes into alloy steels and magnet steels.

The balance of 10 per cent finds numerous uses in industry among

which are wire filaments for incandescent lamps; elements of radio and electronic tubes, special tubes and rectifiers; electrodes for gaseous discharge tubes; X-ray targets; tungsten carbide tools and dies; contact points in electric equipment; phonograph needles; and filler in inks and dies.

While the United States never has been able to supply more than about 25 per cent of its tungsten requirements, even under the stimulus of high prices during the World war when high-speed steel reached the extremely high price of \$3 per pound, still the country has a valuable although small tungsten mining industry.

Institute Issues Section Of Steel Products Manual

American Iron and Steel institute has published section I of a Steel Products Manual, covering pig iron and ferroalloys. Similar sections will be issued later covering other major classes of products, as well as general sections dealing with tolerances, methods of inspection, methods of sampling and chemical analysis, definitions of technical terms and other related information.

During the past decade new products have been developed and old ones improved. New products have brought new terms and practices into use, and improvements in old products have changed the precise meaning of terms to describe them, and also the practices used in their manufacture, dealing and inspection.

Ferroalloys

Ferroalloy Prices, Page 70

New York — Ferromanganese prices are strong at \$102.50, duty paid, Atlantic and Gulf ports, with increasing trade opinion that an advance for fourth quarter will probably be named, when books are opened about Sept. 15. This expectation is based primarily on the strong upward trend in manganese ore prices. However, it is still too early to say what action will be taken, trade leaders point out.

Shipments so far this month are ahead of July, as excess stocks laid in June are being worked off. Should an increase be announced for next quarter the closing two weeks of September should be particularly active, with consumers endeavoring to get in stocks prior to the effective date of increase, Oct. 1.

Domestic spiegeleisen, 19 to 21 per cent, is holding at \$33, Palmer-



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ton, Pa., with 26 to 28 per cent material at \$39, Palmerton, Pa. The movement of spiegeleisen has been abnormally good for this season of the year, not only by virtue of the fact that steel operations have been holding up exceptionally well but due to the fact that protective covering in June was relatively moderate.

Equipment

Boston—Heavier buying has developed in some lines, notably grinding equipment. Additional orders from automotive builders, accessory plants and refrigerator producers have been placed, the latter having increased output materially. Foreign inquiry is active with Japan and most European countries, Germany excepted, placing machinery here. Most shops will not promise delivery on export orders until early next year. One producer will not take new business on some lines except from regular customers. Textile and paper mill suppliers are active with good backlogs. Utilities have placed large orders for heavy electrical equipment.

New York—Contracts are being closed on crane equipment costing approximately \$100,000 for the 207th street shops, Independent Rapid Transit railroad, New York. Two 30-ton cranes with 60-foot, 5½-inch spans are required, also eight 5-ton units with spans 17 to 18 feet; two 3-ton jib cranes with 40-foot booms; slings, car supports and spares. Machine tool buying is steady with a fair number of single units being placed.

Considerable volume is being figured. Deliveries show no improvement and most heavier equipment now being booked cannot be delivered before early next year. Machinery is also being bought for several large industrial developments in New Jersey.

Chicago—Signs of better activity in machinery and plant equipment markets are appearing, and prospects for the last four months of the year generally are looked upon favorably. Some improvement in sales already has appeared, while waning of the vacation period is expected to quicken action on purchases. Inquiries are heavier in some instances, but for several weeks have been insufficient to support for long the recent rate of awards. Outlook for active demand from railroads is poor in view of economy programs.

Seattle—Demand for lumber industry equipment, electrical items and road building machinery is fair. Mining equipment is moving slowly. Pumping plant machinery continues in good demand.

Construction and Enterprise

Ohio

BUCYRUS, O.—City plans to build a sewage disposal plant costing \$140,000, with aid of PWA, and council has authorized employment of engineer. Maturity awaits PWA approval. A \$75,000 bond issue was passed two years ago. George M. Birk is mayor and R. L. Hertzler is service director.

CINCINNATI—American Lacquer Co., 1127 West Sixth street, plans to build a factory costing about \$40,000, for which William Leuvelink & Son, 3995 Woodford road, has general contract.

DELAWARE, O.—City plans to erect an elevated steel water tank of 250,000 gallons capacity. Sidney A. Rowland is mayor and Burgess & Niple, 568 East Broad street, Columbus, are engineers.

PLEASANTVILLE, O.—Village is taking bids due noon Sept. 3 for a 75,000-gallon steel storage tank and two vertical turbine well pumps. E. M. Wildermuch is village clerk, and Walter Graf, city engineer of Lancaster, O., is consulting engineer.

SPRINGFIELD, O.—Springfield Mfg. Co., manufacturer of gears, fly-wheel gears, and other transmission products, plans to construct a 1-story plant, to cost about \$45,000 with equipment.

WILLIAMSPORT, O.—Village is considering construction of waterworks plant to cost \$50,000, and installation of sewerage system to cost \$80,000. Application for WPA aid will be filed when village raises its share of cost, \$40,000.

Michigan

ADRIAN, MICH.—Michigan Rural Electric Corp. Inc. plans to construct a 1-story electric generating plant at an

estimated cost of \$130,000. Engineer is R. A. White, care of company.

DETROIT—Pneumatic Truck Body Corp. of Michigan, 17635 Mount Elliot avenue, has been organized to manufacture motor truck accessories and equipment.

DETROIT—Department of public works is taking bids due Sept. 22 for furnishing and installing electric transformers for power and lighting at the Detroit sewage disposal plant.

DETROIT—Yale & Towne Mfg. Co. branch plant on Cloverdale avenue has been leased to the Detroit Macoid Corp., Conant avenue. Jacob E. Goldberg is treasurer of Macoid, which manufactures plastics for automobile interiors.

New York

ALTON, N. Y.—Ansbacher-Alton Chemical Co. will let contract soon for construction of 1-story plant, estimated to cost \$50,000.

ELMIRA HEIGHTS, N. Y.—City will construct a sewage disposal plant estimated to cost \$344,000, and has applied for WPA aid. C. J. Tabor is mayor.

JAMESTOWN, N. Y.—City plans to construct a municipal gas plant and distribution system at an estimated cost of \$1,500,000. Voters will pass on project at special election. L. L. Graham is city engineer.

LEROY, N. Y.—Lapp Insulator Co., J. S. Lapp, president, plans to build a plant addition and laboratory, at a cost of \$40,000.

LOCKPORT, N. Y.—Flintkote Co., E. B. Highhouse, plant manager, 198 Mill street, will build an addition on Frost street, for manufacturing sound-deaden-



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ing materials. Cost will be around \$60,000 with equipment.

LONG ISLAND CITY, N. Y. — Acme Shellac Products Corp., 48 Thirtieth street, plans repairing its shop which was recently damaged by fire. Estimated cost is \$40,000.

NEW YORK—H. K. Lorentzen, 391 Broadway, will build a 6-story factory at 395 Broadway, at a cost of \$100,000. Architect is L. A. Hornum, 1181 Broadway.

NEW YORK—Gordon Neill Co., 91 Seventh avenue, plans alterations to its liquor rectifying plant at 120 Sherman avenue, Jersey City, N. J. Including equipment, cost will be about \$40,000.

UTICA, N. Y.—Shenandoa Rayon Corp. plans soon to install new equipment in its plant here.

New Jersey

GRASELLI, N. J.—General Anline Works plans to build a manufacturing plant, and has given general contract to White Construction Co., 95 Madison avenue, New York. Estimated cost is \$500,000.

HAMILTON, N. J.—City plans to build a sewerage system, treatment plant, and pumping station at a cost of \$1,628,290, and will apply to PWA for grant. H. A. Kelly, 921 Berger avenue, Jersey City, is engineer.

NEWARK, N. J.—City plans to install two chlorinating machines in present waterworks reservoir at Cedar Grove, N. J. W. G. Bank is city engineer, city hall. Estimated cost is \$35,000.

Pennsylvania

ERIE, PA.—Sun Oil Co., 1608 Walnut street, Philadelphia, plans to build a bulk storage plant at a cost of \$65,000.

MIDLAND, PA.—Air Reduction Sales Co., manufacturer of industrial gases, welding and cutting apparatus, etc., will construct a 1-story plant at a cost of \$50,000, with equipment.

WILLIAMSPORT, PA. — Williamsport Textile Corp. plans to construct a plant addition and has given general contract to Hughes-Foulkrod Co., Philadelphia. Cost will be around \$125,000. F. T. Small, Cumberland, Md., is in charge.

Connecticut

BRIDGEPORT, CONN. — Bridgeport Metal Goods Mfg. Co., 305 Cherry street, is taking bids for construction of a 1-story, 75 x 100-foot factory, estimated to cost \$40,000. Fletcher-Thompson Inc., 1336 Fairfield avenue, is engineer.

Massachusetts

LOWELL, MASS.—Lowell Textile institute plans to build a 3-story addition to its chemistry building, to be 19 x 60 feet. Work will begin soon, and cost is estimated at \$130,000, with equipment. Ashton & Huntress, Lawrence, Mass., are architects.

NORTH GRAFTON, MASS.—Washington Co., manufacturer of emery products, plans to rebuild its fire-damaged plant at a cost of about \$40,000, including equipment.

WALTHAM, MASS.—Judson L. Thomson Mfg. Co., South street, manufacturer of tubular rivets, rivet-setting machines, etc., will construct a 4-story plant addition. Estimated cost is \$75,000, with equipment.

WORCESTER, MASS. — Consolidated Rendering Co., care of A. E. Bump, archi-

tect, 25 Faneuil hall, Boston, plans to build a \$40,000 factory.

Illinois

CHICAGO—Illinois Shipping Container Co., 1520 West Roosevelt road, is taking bids for construction of a 1-story plant estimated to cost over \$40,000. A. Epstein, 2001 West Pershing road, is architect.

CHICAGO—Tropic Aire Inc., 2638 Indiana avenue, plans to build a factory at Augusta boulevard and Kilbourne avenue. General contract has been given to R. G. Regan Co., 228 North LaSalle street. Estimated cost is \$200,000. V. L. Charn, 664 North Michigan avenue, is architect.

Indiana

COLUMBIA CITY, IND. — Columbia Products Co. will add 30,000 square feet of space to its facilities and build a 1-story plant for manufacturing metal products. Estimated cost, with equipment, is \$60,000.

KENDALLVILLE, IND. — Newham Foundry plant was damaged recently by fire. Rebuilding plans are indefinite.

Alabama

MOBILE, ALA.—National Gypsum Co., 190 Delaware avenue, Buffalo, N. Y., will install motors and controls, conveyors, loaders and other mechanical handling equipment in branch factory to be constructed at Mobile for manufacturing insulated fiber board products. A powerhouse will also be built. Total cost will be approximately \$1,500,000.

District of Columbia

WASHINGTON—Potomac Power Co. plans to build a 2-story shop and service building at 2255 Eleventh street Northwest, at a cost of \$350,000.

WASHINGTON — Bureau of supplies and accounts, navy department, is taking bids due Aug. 31 for 3000 sets of metal stampings, schedule 1434, for delivery Portsmouth, Va., and for miscellaneous quantities of nickel-copper-aluminum alloys, schedule 1439, for delivery Mare island, Calif. Bids are due Sept. 10 for miscellaneous steel plates, sheets and strips, schedule 1428, and for steel angles and shapes, schedule 1429, for delivery Portsmouth, N. H.

WASHINGTON — Bureau of supplies and accounts, Navy department, is taking bids until Sept. 3 for miscellaneous steel reinforcing bars, schedule 1445, for delivery various coast points; miscellaneous copper-nickel alloy sheets, schedule 1450, for delivery Mare island, Calif.; and for a gasoline engine driven crane with rotating boom, schedule 1473, for delivery Washington. Bids will be taken until Sept. 7 for a motor driven pipe threading machine, schedule 1475, and for miscellaneous high tensile steel plates and discs, schedule 1476, for delivery Washington.

Kentucky

ASHLAND, KY.—City plans to make waterworks improvements costing \$225,000.

COVINGTON, KY.—Kentucky Chemical Mfg. Co., 410 East Tenth street, plans to build six 1-story buildings at its plant. Hillsmith & Co., Chamber of Commerce building, Dayton, O., is engineer. Estimated cost is \$40,000.

SOMERSET, KY.—City plans to build a municipal electric power plant, and is having a survey made of costs. W. C. Norfleet is mayor.

WINCHESTER, KY.—Thomas Hogan Mfg. Co., 334 Burns avenue, manufacturer of gas grates, etc., plans to rebuild its fire-damaged plant.

Florida

ORLANDO, FLA. — Orlando Utilities commission, M. W. Brown, general manager, will receive bids Oct. 4 for a 10,000-kilowatt turbine, boiler, and auxiliaries. Cost is estimated at \$600,000. Robert & Co., Bona Allen building, Atlanta, Ga., is engineer. (Noted STEEL Aug. 2.)

Georgia

ATLANTA, GA.—William E. Dunn Jr., dealer, 240 Peachtree arcade, is in the market for a steel tank and tower, 100,000 to 125,000-gallon capacity.

BRUNSWICK, GA.—Hercules Powder Co. has started work on \$150,000 improvements to plant, including building of additions.

North Carolina

BENTON HEIGHTS, N. C.—J. H. Myers Lumber Co. plans to rebuild its plant which was recently damaged by fire. Estimated cost, including equipment, will be \$75,000.

CHARLOTTE, N. C.—City plans a \$1,000,000 water plant improvement program, to include erection of a 1,000,000-gallon and two 500,000-gallon elevated steel tanks, and construction of a filtration plant, on which bids probably will be asked about Sept. 15.

DURHAM, N. C.—Liggett & Myers Tobacco Co., 212 Fifth avenue, New York, plans to build a power plant addition for which George W. Kane, Snow building, has general contract. Engineer is Lockwood Greene Engineers, 30 Rockefeller Plaza, New York.

WINSTON-SALEM, N. C.—City plans construction of a heating plant in the 4-story city hospital, and a fund of \$350,000 has been arranged. Northrup & O'Brien, Reynolds building, is architect.

Louisiana

BOSSIER CITY, LA.—City is considering building a light plant and is having survey made to determine advisability. Estimated cost is \$200,000. Hoffman Fuller is mayor.

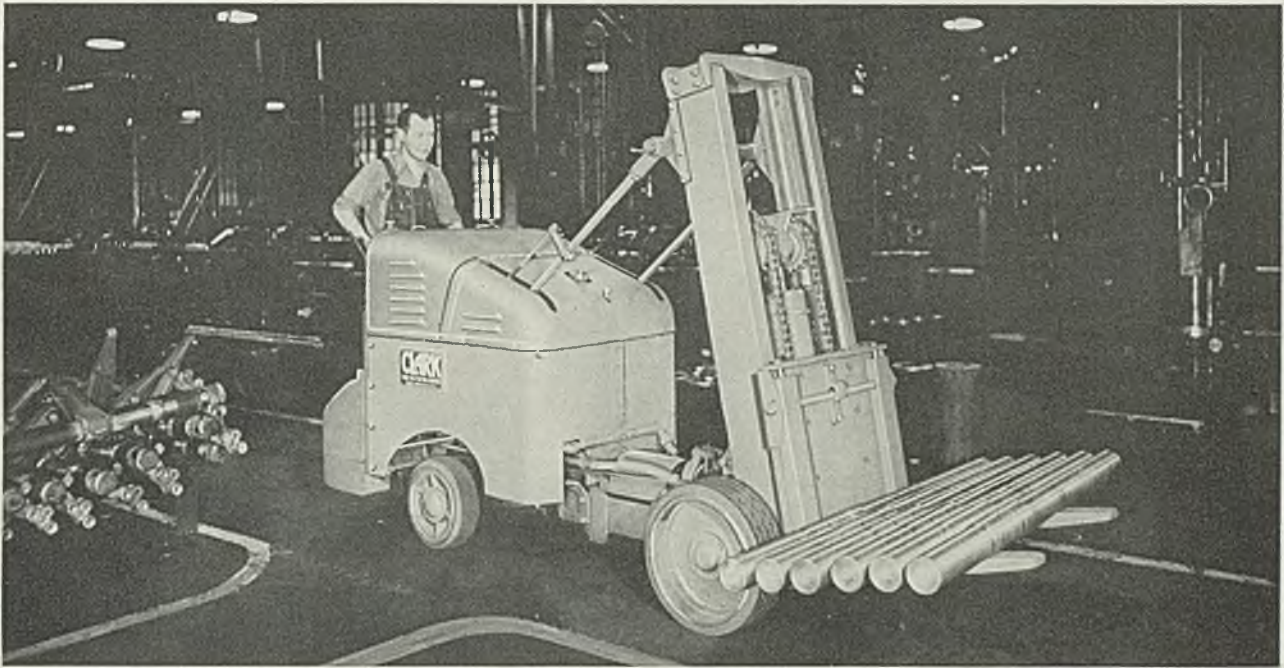
GONZALES, LA.—Corporation, care of C. C. Chapman, Bank of Co-operatives, Gonzales, plans to build a sugar mill with daily capacity of 1000 tons of cane. Estimated cost is \$500,000.

NEW ORLEANS—Delta line will build two \$270-ton ships for service between New Orleans and other gulf coast ports and South America. Boats will be 465 feet long and have a 65-foot beam. V. M. Friede, local naval architect, is preparing plans and specifications. N. O. Pedrick is general manager of the Mississippi Shipping Co. Inc., operator of the Delta line.

Tennessee

MEMPHIS, TENN.—United States engineer's office is taking bids until 11 a. m., Aug. 31, for construction of 15 welded steel dredge pontoons, 18 x 48 feet and 2 feet 10 inches deep.

NASHVILLE, TENN.—Tennessee Electric Power Co., subsidiary of Commonwealth & Southern Corp., will build a



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Wherever heavy loads must be picked up, lifted clear and carried swiftly from storage to manufacturing operations—from finishing department to shipping dock—"Clark" Direct-Gas-Powered Truclifts do the job economically. This 3-ton finger tilt truck carries 6000 lbs. 25 in., in front of vertical plate. Its

6 in.-wide fingers require only 2 in. underclearance, have an adjustable spread to 40 in., lift to 50 in. Equipped with self-starter, hydraulic brakes, automatic controls. Forty-nine other models of greater and smaller capacities. Write for catalog.

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**THOMSON-GIBB ELECTRIC WELDING CO.
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\$2,000,000 steam-electric plant at Nashville. J. C. Guld Jr. is president.

West Virginia

COLLIER, W. VA.—Collier Steel Corp., steel fabricator, has been organized by Richard H. Wright, Phyllis Wright and Lucy Killmer, all of Cleveland, O. Wright is president of Guarantee Specialty Co., East Ninety-sixth street, Cleveland, manufacturer of metal stampings and other products.

Missouri

ST. LOUIS, MO.—Ford Motor Co., care of B. Hanson, head of construction department, 3674 Schaefer road, Dearborn, Mich., plans to build an assembly plant with marine facilities on a 300-acre tract near the junction of the Meramec and Mississippi rivers at the southeastern end of St. Louis county.

ST. LOUIS, MO.—Keasby & Mattison Co., Ambler, Pa., has started work on its new 120 x 675-foot plant for manufacturing asbestos cement pressure pipe. Cost will be around \$500,000. United Engineers & Constructors Inc., Philadelphia, has general contract. Specially designed machinery will be installed. The company plans also to build a plant costing \$750,000 at Ambler for manufacturing the same pipe. (Noted STEEL Aug. 9.)

Arkansas

CAMDEN, ARK. — Southern Kraft Corp., subsidiary of International Paper Co., plans to build an addition to its paper-making mill, at a cost of approximately \$600,000.

Oklahoma

TULSA, OKLA. — Phillips Petroleum Co., Bartlesville, and Shell Petroleum Corp., Shell building, St. Louis, plan to construct a plant in Billings field, Noble county, for recovering from 10,000 to 15,000 gallons of gasoline daily from casinghead gas.

Wisconsin

CHIPPEWA FALLS, WIS. — Wisconsin Power Co-operative plans to build a power plant costing \$196,003, for which Busch-Sulzer Bros. Diesel Engine Co., St. Louis, is low bidder for equipment. Walter Leonard, Ellsworth, Wis., is Co-operative secretary.

MADISON, WIS.—Atco Co. has been incorporated to manufacture farm machinery, by Joseph D. Anderson, Ralph D. Thomas and V. D. Anderson.

MILWAUKEE — Ampeco Metals Inc., 3830 West Burnham street, producer of non-ferrous castings, tools, etc., will build a 1-story, 80 x 200-foot foundry addition. Architect is N. P. Backes, 610 West Michigan street, and Carl J. Zaiser is president. General contract will be awarded soon.

RACINE, WIS.—County board of commissioners has appropriated \$25,000 for two new boilers and stokers to be installed in county institutions. Harry Bassinger is county clerk.

Minnesota

MANKATO, MINN.—Little Giant Co. has been incorporated to manufacture power hammers, by L. J. Fazendin, Charles Butler and Marcella Hiniker.

MINNEAPOLIS — Keb Mfg. Co. has been incorporated to manufacture oil burners and air conditioning equipment, by Herbert Kennison, E. C. Ellsworth and E. L. Burke.

MINNEAPOLIS — General Metalware Co., 1401 Central avenue Northeast,

manufacturer of metal containers, plans immediate rebuilding of its 3-story factory, which was damaged by fire Aug. 24. Estimated renovating cost is \$75,000.

WYOMING, MINN.—Johnson Mfg. Co. has been formed to manufacture snow fence, snow plows and small tractors.

Texas

DALLAS, TEX.—National Lead Co., 111 Broadway, New York, has acquired four acres west of the Trinity river, and will start construction within a few weeks on a large lead smelting plant, which will double the present capacity at Dallas. C. M. Bodine, 959 Terminal building, is branch manager.

GRANDFALLS, TEX. — Red Bluff Water Power Control district, Uel Stephen, chief engineer, will let contract about Sept. 20 for construction of electric generating plant on the north bank of the Pecos river. Distribution lines also will be erected. Engineer is J. B. Shaw, Houston.

HOUSTON, TEX.—Standard Brass & Mfg. Co. will build a 100 x 100-foot manufacturing plant at Franklin and St. Emanuel streets. John F. Staub is architect.

South Dakota

ALCESTER, S. DAK.—Lincoln-Union Electric Co. plans to make extensions to its rural electrification lines in Canton, Dayton, and Highland townships. Outdoor substations will be built. Estimated cost is \$208,000, part of which will be met with federal aid.

Iowa

ALTA VISTA, IOWA—City is planning construction of sewage disposal plant to cost about \$25,000. E. F. Schenk, Waterloo building, Waterloo, Iowa, is engineer.

BOONE, IOWA—Boone Box & Mfg. Co. has been organized to manufacture boxes. Raymond J. Meyers is president.

CEDAR RAPIDS, IOWA—Century Engineering Corp., manufacturer of oil burners, plans to remodel a building for use as a factory and has given general contract to O. F. Paulsen Construction Co., Dows building.

HUMBOLDT, IOWA—Humboldt County Rural Electric Co-operative, Paul Edwards, secretary, has been allotted \$115,000 additional REA funds for erecting distribution lines and constructing generating plant. Complete cost will be \$360,000.

IDA GROVE, IOWA—Iowa Public Service Co., Sioux City, will make improvements to its plant, including installation of a new 475-horsepower turbine generating set, circulating pump for heating system, and meters.

IDA GROVE, IOWA — Iowa Public Service Co., R. C. Clifton manager, is considering purchase of a new turbine generating set and one 1250-gallons-per-minute circulating pump. Total cost is estimated at \$23,000.

KEOKUK, IOWA—Iowa Can Co., subsidiary of Iowa Fibre Box Co., has been incorporated to manufacture fibre cans, tubs, pails, hand trucks and casters. The company will occupy a new factory which is expected to be in operation some time in September. J. F. Thomas is president.

PERRY, IOWA—City plans to build a sewage disposal plant to cost \$100,000. Buell & Winter, Sioux City, is engineer.

WEST LIBERTY, IOWA—City is taking bids until Sept. 14 for a 450-horsepower diesel engine with necessary auxil-

ary equipment and complete new switchboard. Estimated cost is \$17,000. Ralph Evans is mayor.

Montana

MISSOULA, MONT.—Montana Culvert & Pipe Co. has been incorporated to manufacture corrugated metal culverts and pipe, by W. W. Lewis, Calvin Verity, S. R. Ives, W. W. Sebald, E. A. Roberts, H. W. Gregory and D. H. Henderson.

Idaho

BOISE, IDAHO—Reclamation bureau will take bids until Sept. 2 for construction of Succor creek pumping plant, involving pipes, shapes, and equipment.

BOISE, IDAHO—City has received permit for construction of proposed Payette river power project estimated to cost \$350,000, and to develop 12,000 horsepower. Plans include storage dam, pipeline, powerhouse and other building.

Pacific Coast

AVON, CALIF.—Tide Water Associated Oil Co. plans to build a polymerization plant with a capacity of 5,000,000 cubic feet, and has given general contract to Alco Products Co., Dunkirk, N. Y.

LOS ANGELES—North American Aviation Corp. plans to construct a new \$300,000 plant on a site adjacent to the Los Angeles municipal airport.

LOS ANGELES—Golden Gate & Miners Iron Works, 249 First street, will build plant additions, and has given general contract to F. J. Reilly, 6350 Fulton street. Cost will be \$35,000, exclusive of equipment.

SEATTLE—Alaska Tin Co. has been incorporated by Leslie W. Roberts and associates, 2208 Fourth avenue.

SEATTLE — Sunset Electric Co. will build a plant addition on Westlake avenue North at an estimated cost of \$60,000, and A. W. Larson has general contract.

VANCOUVER, WASH. — City water board is considering building a high pressure steel water tank, with 500,000-gallon capacity.

ASTORIA, OREG. — Plant of Pacific Marine Products Co., Warrenton, Oreg., which was recently damaged by fire, will be rebuilt. Gilpin Construction Co., Portland, has general contract. The firm reduces pilchards.

Canada

PRINCE RUPERT, B. C. — Frank L. Buckley, Vancouver, B. C., heads a group planning to build a bleached sulphite mill with a daily capacity of 250 tons. Estimated cost is \$8,000,000.

VANCOUVER, B. C.—British Pacific Oils Ltd., 800 Hall building, plans to develop its properties at a cost of \$100,000.

FORT FRANCIS, ONT.—Ontario & Minnesota Power Co. Ltd. plans to construct a grinder house at a cost of \$150,000.

SAULT STE. MARIE, ONT.—Great Lakes Power Co. Ltd. is taking bids for construction of a power plant at the mouth of the Montreal river, to develop 10,000 horsepower. Estimated cost is \$1,000,000.

TORONTO, ONT.—Water Chemical Co. Ltd., 355 Weston road, plans to build a factory at an estimated cost of \$50,000.

MONTREAL, QUE.—Merritt Chemical Co. Ltd., care of Joseph C. Savage, 215 St. James street West, plans to build a factory for manufacturing dyestuffs and cosmetics. Estimated cost is \$50,000.