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STEEL

ESTABLISHED 1882

Contents

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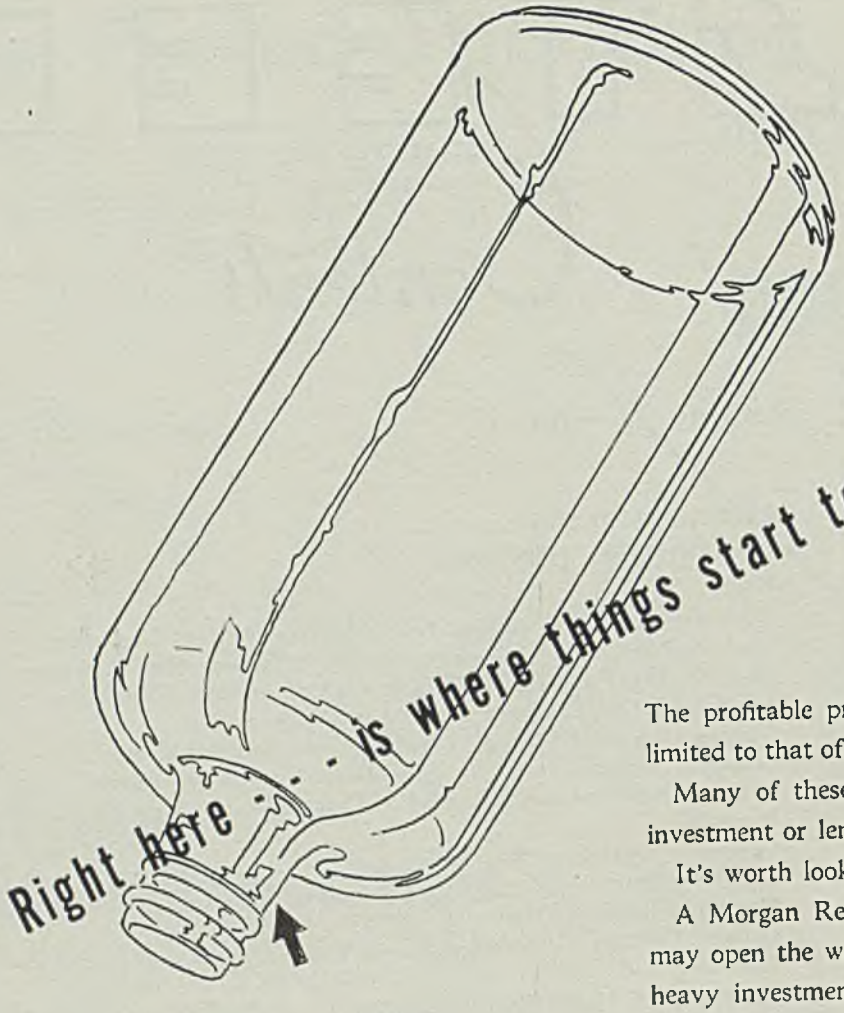

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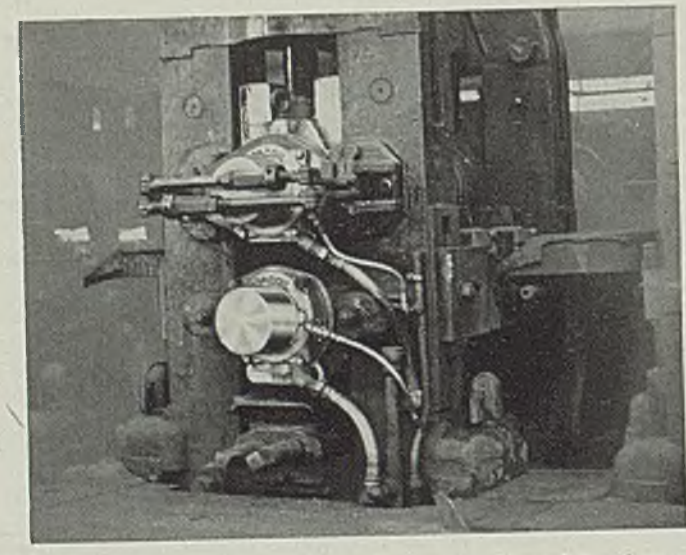

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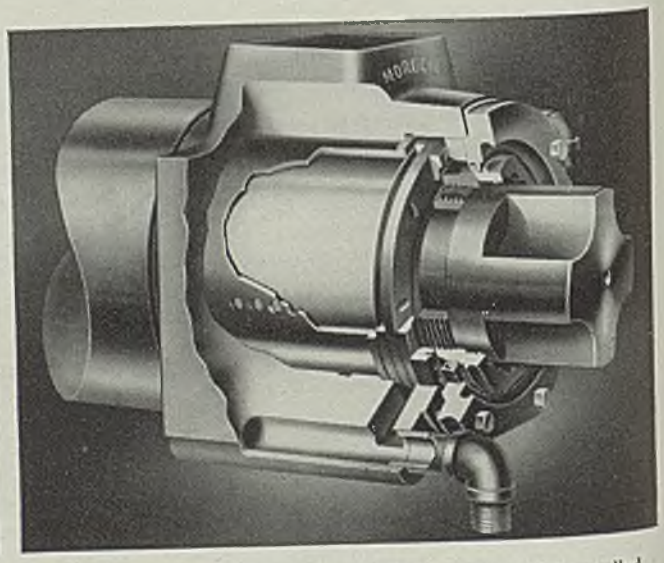

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STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

HIGHLIGHTING THIS ISSUE

■ DEMAND for finished rolled steel continues to swell. Production last week (p. 21) moved up another half-point to 95 per cent of ingot capacity. Despite this huge output deliveries continue to tighten and the best promises to be had date them three to 12 weeks in the future depending on the particular product. Possibility is seen that when the defense program gets into stride (p. 77) it will require steel in considerably larger volume than the previously estimated 7,000,000 to 8,000,000 tons annually. President Roosevelt sees no present need (p. 13) for compulsory priority orders. Voluntary preference ratings on forgings and machine tools, however, are seen as a start in that direction.

• • •

Strong pressure continues aimed at preventing upward price spirals. Agreement was reached at a defense commission conference last week (p. 14) that the scrap market is orderly and should not advance sharply . . . Hardware wholesalers, last week were advised (p. 17) to maintain adequate stocks and to anticipate requirements further ahead than usual; also, to specify standard products so as to facilitate production. . . . Tool engineers were told (p. 15) that the shortage of skilled workers requires development of machines, tools and methods that can be used by unskilled men on repetitive operations . . . . Various organizations and meetings (pp. 15, 18, 19, 30) last week were concerned with defense co-operation.

Check-Rein On Prices

• • •

New defense contracts include (p. 21) one for cast armor for army tanks. . . . A new hydraulic press (p. 14) hot-forges shells in one operation in two seconds. Another (p. 15) machines them one per minute . . . Supreme Court has decided to review the famous litigation over the profit status of Bethlehem Shipbuilding Corp. (p. 24) in building ships under government contracts a quarter-century ago. . . United States Controller General Elliott rules (p. 23) that government contracts may be withheld from a company held by the labor board to be a labor act violator even though that company might have been low bidder on an advertised requirement. . . . No labor shortage (p. 16) faces the steel industry.

New Armor For Tanks

• • •

Defects in tubing now are located through use (p. 38) of a new principle which is applied as easily to magnetic as to nonmagnetic materials. The system employs a set of energizing coils and a set of detector coils mounted on a table with amplifiers and drive rolls, control and auxiliary equipment. It functions by inducing a medium-frequency alternating current in a circular path in the tube wall . . . . Experimental studies prove that tungsten carbide tools permit (p. 41) substantial reductions in tooling costs. . . . Materials handling is an important factor in the manufacture of bolts and nuts. Fred B. Jacobs (p. 52) describes a system in use at a well-equipped plant.

Finds Flaws In Tubing

• • •

W. J. Phillips and T. D. West (p. 48) state the case for cast steel gears and tell how defects are held to minimum as a result of control which today's foundryman is able to exercise over his product. . . . Paints formerly made with drying oils from countries now at war or embargoed (p. 72) are being made with castor oil. . . . T. B. Montgomery (p. 56) discusses the factors and values involved in reducing cold-rolled strip steel under tension . . . . New adjustable die sets yield lower costs and are versatile (p. 46) in perforating and notching sheet metal. . . . Now available is a biography (p. 55) of Sidney Gilchrist Thomas, inventor of the basic open-hearth steelmaking process.

Control in Cast Gears

Prescribed for Tough Forming Jobs

THE above sheet has an important history. It was prescribed by Inland metallurgists to solve a specific forming problem, to take a fine finish, and to make a better product.

It was conceived when a manufacturer, looking for sheets best suited for his needs, called in an Inland metallurgist. Together they studied the part design, fabrication method, finish, and use of the product.

From this study came a sheet specification written by Inland metallurgists, who personally checked processing methods and quality. These metallurgists, working side by side with Inland skilled inspectors, made certain that this sheet will meet the customer's requirements. Every order placed in the future against this specification will be given the same care and attention. As a result users can depend on Inland quality and uniformity from sheet to sheet, and from order to order.

This is what Inland calls "metallurgical co-operation with customers." This is why Inland Sheets have an enviable reputation for exceptionally fine performance in customers' shops.

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U. S. To Requisition Machine Tools.

Defense Materials Destined for Export

Manufacturers Ask for Data on Foreign Purchases.

Compulsory Priorities Not Imminent, Says President.

Scrap Producers Opposed to Inflationary Prices.

WASHINGTON

■ NATIONAL defense officials last week moved to put into effect President Roosevelt's executive order for the requisition of machine tools and other equipment and materials needed for the national defense program.

Officials said the government would immediately requisition unexported machine tools owned by foreign purchasers, which are mainly governments. Some of these tools and materials now are on piers awaiting shipment to Russia, Japan and other countries.

Letters have been sent by the national defense commission to all machine tool manufacturers requesting information on the type, number and location of tools affected by the order. All requisitioned goods are to be paid for by the government at a "fair price."

Manufacturers Co-operative

The President's order followed enactment of a bill giving him authority to confiscate machine tools and other materials destined for export under foreign orders.

Defense officials believe there will be little if any need to requisition tools and materials from American manufacturers because manufacturers have "demonstrated a most co-operative spirit." The act and executive order were directed toward the obtaining of equipment and supplies already purchased by or for foreign governments.

"The titles in some cases are held by foreign purchasers who do not care to sell," said Col. R. L. Maxwell, administrator of export control.

"In other cases the articles are in possession of a purchasing agent or other representative of a foreign government who is without authority to make such a sale. This act in all probability will apply for the most part to machines or material already completed or approaching completion but which cannot be exported because of licensing requirements. Licenses are now required for exportation of articles and materials the President has determined should not be exported except under licenses from the United States. Machines and materials for use and intended for our own defense program will not be affected."

Defense officials believe the new requisition system, supplementing the President's licensing powers, will help materially in easing the "bottleneck" of machine tool production which has been called the greatest single obstacle to early execution of the armament program.

Although government spokesmen limited their remarks on the order to the benefits it was expected to work to the defense program, informed observers held that the power to requisition or release for export has put in the hands of the President a powerful lever in dealings with foreign powers.

Administration officials have been holding conferences for the past week on further licensing of several commodities for export to Japan. An executive order, which probably will include special alloy steels and which, like the scrap licensing order, will be a virtual embargo, is understood to be in the making.

COMPULSORY PRIORITIES NOT YET "IMMINENT"

Need for compulsory priority orders for national defense materials has not yet become evident, President Roosevelt stated last Friday. The Chief Executive admitted the priority question is coming to a head but insisted compulsory orders are not imminent.

Several steel producers last week reported they had been approached by customers who said they had rating forms and asked for early delivery of steel to fill defense orders. According to the President's statement, all such ratings still are on a voluntary basis.

Donald Nelson, co-ordinator of purchases for the government, said there has been no change in the situation and pointed out that voluntary preference ratings have been in effect for several weeks.

Steel experts attached to the defense commission say that no preference ratings have been issued for rolled steel products, although ratings may have been issued for forgings and machine tools.

SEE TENDENCY FOR NORMAL INCREASE IN SCRAP SUPPLY

Leon Henderson and E. R. Stettinius Jr., national defense advisory commission members, met last week

with representatives of leading scrap suppliers—railroads, agricultural implement, automotive, electrical and machine tool manufacturers. Those present were unanimous that, as large steel purchasers, they had no interest in seeing scrap prices rise to the extent it would be necessary to increase price of steel.

Surveying the supply situation, they agreed the tendency should be for a normal increase in supply of scrap for 1941 over this year.

Defense advisory commission, at the scrap suppliers' suggestion, is augmenting its studies of the supply situation with view to possibility of increasing supplies of heavy melting scrap through wider use of large hydraulic presses for compressing lighter gage materials. Such presses represent substantial capital investment but permit preparation of scrap in a form more acceptable to steelmakers.

Opinion expressed at the meeting of steel representatives and scrap iron and steel dealers, who conferred with Messrs. Stettinius and Henderson a week earlier was concurred in. It had been decided indications were necessary supplies will be available at prices in line with those prevailing in recent years.

In furthering this opinion, scrap suppliers all agreed the situation was not similar to that which prevailed in the middle of 1936 when steelmakers, short of inventories, were bidding frantically for scrap. They also agreed the market is orderly at present and there is no indication of a further sharp rise in prices.

Shell Forging Made In One Operation

■ United Engineering & Foundry Co., Pittsburgh, has developed a hydraulic shell forging press, designed upon the principle of making a complete shell forging in one operation without extrusion of the steel during the piercing of billet.

By making the complete shell forging in one operation, a second step, or draw press operation, is completely eliminated. Greater accuracy and concentricity is obtained and minimum amount of metal is required in the billet, it is claimed.

A heated billet is inserted vertically in a book-type split and hinged die. A control lever sets in motion two hydraulic horizontal rams that operate the wedges for closing the water-cooled die around the billet and at the same time a lower vertical supporting ram moves upward. Actuated by the top and main hydraulic ram, the punch unit moves downward and into the billet for the piercing operation.

As the punch progresses into the billet, the metal flows sideward and downward beside and ahead of the punch tip. When the punch has reached the bottom of its stroke and the cavity of the shell forging is formed, a lever is automatically tripped for the return stroke. This also opens the die when the punch has retracted.

Only about two seconds are required for the actual piercing operation. Any shell from 75 to 155 millimeters can be forged in this manner. The press was designed by Dominion Engineering Works Ltd. of Canada, an associated company of United Engineering & Foundry Co. The latter has exclusive rights for manufacture in the United States.

Enamelers Find Domestic Clays Satisfactory

■ Because of the stopping of imports of German clay every effort is being made to use American material, and so much progress has been made in this direction that the enameling industry probably will never return to the use of German material. This fact was brought out at a symposium on clay at the fifth annual forum of the Porcelain Enamel institute, which was held at the University of Illinois, Urbana, Ill., Oct. 16-18.

Over 150 foremen and superintendents were in the opening assembly, the largest number that has ever attended the opening session.

E. E. Marbaker, industrial fellow for the O. Hommel Co. at Mellon institute, Pittsburgh, spoke on the use of American clays and the experiments which have led to successful application. In the speaker's opinion, a long-standing prejudice in favor of German Vallendar clay has been overcome, and American clays are now a definite part of the porcelain enameling process in this country.

F. Zvanut, Ferro Enamel Corp., Cleveland, pointed out that European clays were preferred by early enamelers in this country because they were not sufficiently trained to cope with the problems of their formulae. He told how clays develop opacity by the bubble structure produced, and how this affects scratch resistance. He indicated that American clays can now be successfully used in proper blending.

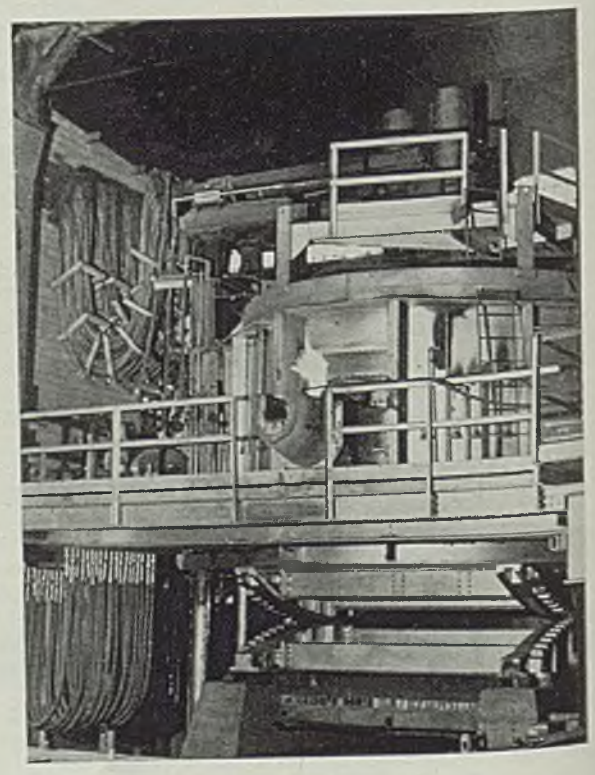
Harriman To Assist Commerce Department

■ Jesse Jones, secretary of commerce, has appointed W. A. Harriman, a member of the national defense commission staff, to assist in developing the commerce department's defense activities. Mr. Harriman will retain his position on the defense commission staff in which he is associated with E. R. Stettinius Jr.

Mr. Harriman has been a member of the commerce department's business advisory council for the past seven years and served as chairman for three years.

Making Special Steels for Armament

■ Increased demand for special steels for national defense materials has prompted producers to increase electric furnace capacity. Typical of new installations is this 50-ton unit at Republic Steel Corp.'s Canton, O., plant. The new furnace is Republic's tenth, and an eleventh will go into operation this month. Of the company's 31,000-ton monthly capacity, 7500 tons have been allocated tentatively to armor plate



Tool Engineers Hear of Machine Capable of Turning Shell a Minute

■ A SHELL machine capable of turning a shell a minute has been designed for the army by the machine tool industry, and a test model is now in operation in the Studebaker Corp. plant, South Bend, Ind., it was revealed last week by Tell Berna, general manager, National Machine Tool Builders' association, in an address before a joint meeting of the American Society of Tool Engineers and the American Society of Mechanical Engineers, Hotel Gibson, Cincinnati.

"Last October," Mr. Berna said, "army ordnance officers asked a committee of machine tool builders whether they would undertake the job of designing a line of single purpose machines for the making of shell, which would be inexpensive, could be built quickly in substantial quantities and which could produce shell in the hands of an untrained operator. The machine tool industry immediately took on the job. Designs were begun before the end of last year and were completed this summer.

"The Studebaker Corp. has built the first of these machines and has it in operation on a continuous life test.

"The reason for the designing of these machines is that in the event of war the army will have tested designs which could be followed by any manufacturer equipped for this type of production. This would insure a broad source of supply and enable the army to get shell in large volume with minimum delay."

Stressing the vital part played by machine tools in the national defense program, Mr. Berna said that the industry had more than doubled its output in the last 12 months and that expansion was continuing steadily.

"Of course machine tools are only one element in national defense production. Many other types of machinery are also needed. Plants need to be built. Men need to be trained, both as machinists and as supervisors. Large numbers of gages, jigs and fixtures will be required. Methods of manufacture must be checked and revised. And then all of these elements have to be co-ordinated before large scale production actually gets under way. The machine tool industry is confident that it will be able to produce the machine tools required just as rapidly as plants will be ready for their installation and men are trained for their operation."

Shell Forging, Finishing Methods Revolutionized Since World War

■ UNDER auspices of Army Ordnance association, and the ammunition group, machine shop practice and metals engineering division, and Cincinnati section of the American Society of Mechanical Engineers, what was characterized as the ASME Meeting on Manufacture of Shell was held in Cincinnati, Oct. 16-17.

This meeting which was attended by more than 100 machine tool men, ordnance experts and others concerned with production of artillery ammunition under the national defense program, was in the nature of a symposium which dealt with all phases of the subject.

The meeting was opened by Edward A. Muller, president, King Machine Tool Co., who acted in his capacity of chief of Cincinnati ordnance district. Speakers at this initial meeting were Lt. Col. M. W. Kresge, ordnance department, United States army, on the subject, "Ordnance Shell Steel Specifications"; and Prof. W. Trinks, Carnegie Institute of Technology, who dealt with "Heating Shell Billets." James L. Walsh, chairman, ASME committee on national defense, presided at this session, and discussion was led by Alan Dauch, George J. Hagan Co., Pittsburgh.

Wednesday afternoon was devoted to the subject of shell forging. Frank Maccorochie, professor of mechanical engineering, University of Virginia, made an analysis of shell forging equipment.

Flow of metal during the forging of shell was described by M. D. Stone, United Engineering & Foundry Co. Discussion of Mr. Stone's paper was led by James H. Hopkins, Salem Engineering Co., Salem, O. Among others who took part in this session were Robert T. Kent, production engineer, ordnance department, United States army, who presided, and George F. Schranz, general manager, Baldwin Southwark division, Baldwin Locomotive Co.

Luncheon speaker on Wednesday was J. B. Doan, American Tool Works Co., who in addition to being one of the deans of Cincinnati's machine tool industry, is president of Cincinnati Chapter of the Army Ordnance association. Dinner speaker was Col. E. N. Harmon, first armored corps, Fort Knox, Ky. Colonel Harmon painted a graphic picture of a vital phase of warfare today. His subject was "Tanks in Action."

The final session was held on Thursday morning, with Erik Oberg, editor, *Machinery,* presiding. Tell Berna, general manager, National Machine Tool Builders' association, gave a talk on "Cooperation Between the Government and the Machine Tool Builders." Discussion of selection of shell machining equipment was led by Lucian I. Yeomans, Lucian I. Yeomans Inc., consulting engineers, Chicago. Mr. Yeomans, who won wide recognition for his achievements in the rapid building of single-purpose shell machinery during the World war, and who has now brought those machines up to date, aroused some interesting debate between the proponents of standard machine tools and of special machine tools for shell work. The other speaker at this session was H. J. Wills, Carborundum Co., Niagara Falls, N. Y., on classification of surface finish of shells.

Conclusions to be drawn from this Cincinnati meeting, which followed a similar clinic recently in Pittsburgh, and which is to be followed by others elsewhere, are that improved methods of forging and improved methods of machining have revolutionized shell manufacture since the days of the World war. Then, it was necessary to bore out the cavities in shells—this being one of the longest single operations. Today, accurate sizing of the cavity in the forging process makes that boring unnecessary. At the same time, the technique of multiple tooling with cemented carbide tools has in some cases cut the time of exterior machining by as much as six to one, and rigid, accurate machine tools of today enable much closer limits and better finishes to be maintained—hence cutting down on rejections.

200 ATTEND TOOL ENGINEERS' MEETING IN CINCINNATI

More than 200 members of the American Society of Tool Engineers, representing 37 chapters and two student chapters in the principal industrial centers of the United States and Canada, attended semiannual

meeting of the organization, in Cincinnati, Oct. 17-19.

The keynote was struck by A. H. d'Arcambal, president of the association, who is consulting metallurgist, Pratt & Whitney, division of Niles-Bement-Pond Co., Hartford, Conn.

"The real bottleneck in our defense preparedness program is the shortage of skilled men, a shortage of skilled men with an unemployment problem of over 9,000,000 workers," he said. "The time factor will not permit training this 9,000,000 to be machinists, so they must be used nearly as they are.

"This condition forces the development of machines, tools and methods to the extent that unskilled workers can be used on repetitive operations with practically foolproof tooling. Analyze this situation from any angle and we find that the tool engineer is the key to the problem."

Doors of the following plants were opened to the visiting tool experts: Cincinnati Milling Machine Co.; R. K. LeBlond Machine Tool Co.; Crosley Corp.; Lodge & Shipley Machine Tool Co.; Cincinnati Shaper Co.; Carlton Machine Tool Co.; National Cash Register Co.; Master Electric Co. (the foregoing two in Dayton); G. A. Gray Co.; King Machine Tool Co.; Cincinnati Bickford Tool Co.; Cincinnati Planer Co.; American Tool Works Co.; Proctor & Gamble Co.; and Formica Co.

Technical sessions were in the form of symposium. That on Thursday evening dealt with the question "Should Industry Assume the Burden of Special Education?" Speakers were: F. E. Searle, head of Ford trade school; Dr. R. C. Gowdy, dean, College of Engineering and Commerce, University of Cincinnati; W. S. Dowman, assistant director of sales and office personnel, Goodyear Tire & Rubber Co. Inc.; and George Schiele, chief inspector and member of the board, Cincinnati Milling Machine Co.

The session on Saturday morning was devoted to gear finishing. Speakers were Charles R. Stab, chief engineer, Michigan Tool Co.; Otto H. Schafer, president, Schafer Gear Works; I. J. Gruenberg, chief engineer, Gear Grinding Machinery Co.; and Charles Pfeffer, in charge of gear development and production, Wright Aeronautical Corp.

A dinner meeting was held Friday evening, Mayor Stewart of Cincinnati being guest-of-honor. Speaker of the evening was Whiting Williams, industrial consultant, writer and lecturer. Mr. Williams' theme was "What We Can Learn from Europe." President d'Arcambal, who presided, presented the progress report of the society, and H. D. Hall, chairman of the educational committee, the report from his committee.

A more extended account of the meeting will be published in the Oct. 28 issue of STEEL.

Visiting U. S. Steel Officials Announce New Cleveland Plant

■ ERECTION of a plant in Cleveland to produce stainless steel strip was announced as pending by Irving S. Olds, chairman, United States Steel Corp., at a dinner given by Benjamin F. Fairless, president, for Cleveland men to meet Mr. Olds and other directors at the Hotel Statler Oct. 17. The expansion will include a building 576 x 80 feet and two storage buildings, one 120 x 80 feet and the other 120 x 67 feet.

The occasion was the fourth of a series where Mr. Olds and directors visit subsidiary plants in various cities. The fifth and last contemplated trip will be to the Pacific Coast, it was announced at Cleveland. On Thursday the officials present inspected plants of the American Steel & Wire Co., Cleveland, and the National Tube Co., Lorain, O.

In introducing Mr. Olds at the banquet to 400 civic and business leaders of Cleveland Mr. Fairless stated that of the 255,918 on the payrolls of the United States Steel Corporation 16,000 are employed at Cleveland and Lorain. The capacity of the Corporation plants of the district is 27,702,000 net tons yearly. They now are working at 97 per cent of capacity.

"Thank God, a great percentage of our steel is going to Great Britain," stated Mr. Fairless. "Steelmakers are meeting with greater competition from other materials more and more, such as from lumber, concrete, plastics, glass, and copper. This is a challenge to better steel and we intend to meet it and at lower prices."

At a press conference preceding the dinner the two heads of U. S. Steel revealed that the Corporation and other American steelmakers generally are already making more armor plate than during the World war. They stated that they hoped steel production costs would not rise since they wish to hold prices down to present levels.

In his main address Mr. Olds stated: "The Cleveland district, endowed as it is by a site midway between the vast natural resources of coal and iron, excellent transportation facilities, rail, water and air, an adequate supply of skilled labor, and nearness to the most important markets, must always be a leader and share substantially in the industrial growth and prosperity of the United States."

Directors present at the banquet were: Philip R. Clarke, William J. Filbert, Leon Fraser, William A. Irvin, Thomas W. Lamont, Junius S. Morgan, George A. Sloan, Robert C. Stanley, Enders M. Voorhees, Benjamin F. Fairless and Irving S. Olds. Absent were Sewell L. Avery, Nathan L. Miller, James A. Farrell, J. P. Morgan and Myron C. Taylor.

Clifford F. Hood, president of the American Steel & Wire Co., presided at the dinner.

STEEL'S LABOR SUPPLY AMPLE, SURVEY REVEALS

No serious shortage of labor exists in the steel industry, nor is there any threat of such shortage, a survey by the American Iron and Steel institute reveals.

Substantially all the steel companies covered by the survey reported the labor supply now readily available to them is ample to assure operations at capacity. Several companies reported they are already running at capacity, with no labor shortage in sight.

These reports were based on present conditions, with no attempt to predict the effect of a large military training program, or of a sharp rise in employment in other industries.

Four measures applied by the industry over a period of years are largely responsible for building up and maintaining adequate reservoirs of labor. They are:

Apprentice programs under which nearly 4000 apprentices are receiving an extensive program of practical education.

Job-training for specific duties, under which promising young men are given intensive training for relatively brief periods in special operations or particular jobs. About two-thirds of the companies now are engaged in such job training.

Work-sharing during depression periods, which retained thousands of skilled and semiskilled men on the payroll, instead of turning them loose to drift into other jobs and industries.

High wage scale. Wage earners in steel plants receive an average of 85 cents per hour, or about one-third more than the average hourly wage in all manufacturing industries.

Maintain Adequate Inventories, Hardware Groups Are Advised

■ HARDWARE wholesalers last week were urged to maintain adequate stocks and to co-operate with manufacturers in the interest of the national defense program. Occasion for the recommendations was the forty-sixth annual convention of the National Wholesale Hardware association and the National Association of Sheet Metal Distributors and the eighty-first semiannual convention of the American Hardware Manufacturers association, held at Atlantic City, N. J., Oct. 14-17. About 1200 attended.

Despite all the changes incident to the vast industrial development the last 50 years or more, no substitute has been found for the wholesaler's function, it was declared by Mark Lyons, McGowin-Lyons Hardware & Supply Co., Mobile, Ala., and president of the wholesalers group, in his annual address. At the same time, hardware wholesalers have many avenues open to them for improvement which will result in greater efficiency in the conduct of their business, he said.

Reduction of overhead costs by eliminating some duplicated lines; closer study of the retailer's requirements; and reduction, through co-operation of salesmen and retailers, in number of small orders having low total value were among the means suggested by Mr. Lyons for attaining this improved efficiency.

Larger Stocks Advised

Speaking of national defense, Mr. Lyons urged distributors to anticipate their requirements for a greater period than usual, so that manufacturers may be enabled to take their share of special work which may be assigned to them and still permit them to co-ordinate their production facilities so as to supply wholesalers' needs. "I believe we can do much by being fully prepared to furnish local requirements in connection with the preparedness program," he added.

National defense as it affects the hardware industry was the topic for discussion at a joint session of the wholesalers and manufacturers, addressed by representatives of both groups. In pointing out that it was important for the latter not only to meet the government's requirements but at the same time to handle ordinary commercial demands, S. T. Olin, Western Cartridge Co., East Alton, Ill., warned that unsound economic practices in government constituted a danger which ranked with that which the defense program was intended to combat.

Four duties face the hardware manufacturer, it was stated by F. A. Bond, the McKay Co., Pittsburgh. These are: to supply national defense needs; to keep himself supplied with material and labor; to furnish distributors with their ordinary needs; and to see that consumers are able to fill their requirements with minimum delay. He recommended that buyers specify standard products insofar as possible.

Pointing out that the period of quick deliveries is past, H. P. Ladds, National Screw & Mfg. Co., Cleveland, recommended that wholesalers carry adequate stocks to meet present conditions. L. M. Stratton, Stratton-Warren Hardware Co., Memphis, Tenn., and Wakefield Baker, Baker, Hamilton & Pacific Co., San Francisco, also suggested that wholesalers conduct their affairs so as to give greatest possible support to defense activities.

R. R. Witt, Builders Supply Co., San Antonio, Tex., indicated that best business and profits were to be expected in fields stimulated by the rapid tempo of industries most closely associated with defense work. Rapidly rising prices should not be expected in the near future; in fact, low prices quoted on certain government purchases have been reflected in quotations on ordinary commercial buying, he said.

Co-operation with sources of supply in anticipating needs so as to eliminate the pyramiding of orders, the giving of priority on material for defense purposes and the encouragement of normal business activities were recommended to wholesalers by H. J. Allison, Glasgow-Allison Co., Charlotte, N. C.

This year will be the best since 1929 in residential building construction, the convention was told by Robert T. Williams, chief, industries section, federal housing administration, Washington. About 500,000 nonfarm dwellings will be built against 465,000 in 1939.

The problem of mill-jobber relationship still awaits solution, according to Lee D. Mercer, Republic Steel Corp., Cleveland. He expressed the belief that both groups must make some concessions if the best interests of each are to be served in the distribution of sheet metal products.

It will be advisable for steel buyers to have a four-months' stock on hand by the first of next year, it was stated by T. C. Campbell, *The Iron Age,* Pittsburgh. He estimated steel consumption for defense needs the next two years at six to eight million tons annually.

Various uses for sheet copper were described by Carter Cole, Copper and Brass Research association, New York. These included its employment for not only roofing, flashing gutters and down-spouts, but also for protection of buildings against moisture, termites and vermin.

The defense program may end class hatred and restore national unity, the American Hardware Manufacturers association was told by its president, H. B. Wilson, Mathias Klein & Sons, Chicago. If it does, he added, "every penny will have been well spent."

Officers Elected

A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind., was elected president of the National Association of Sheet Metal Distributors, succeeding A. W. Howe, the J. M. & L. A. Osborn Co., Cleveland. Recently he had been vice president. George O. M. Johnston, McClure-Johnston Co., Pittsburgh, was named vice president. Elected to the executive committee were O. F. Murphy, Lyon, Conklin & Co., Baltimore, and James G. Beard, Braden Mfg. Co. Inc., Terre Haute, Ind.

Richard Harte was elected president, American Hardware Manufacturers association. Formerly vice president of the group, Mr. Harte is affiliated with Ames Baldwin Wyoming Co., Parkersburg, W. Va. He succeeds H. B. Wilson, of Mathias Klein & Sons, Chicago. P. E. Barth, Sargent & Co., New Haven, Conn., and N. J. Clarke, Republic Steel Corp., Cleveland, were re-elected vice presidents, with S. T. Olin, Western Cartridge Co., East Alton, Ill., also named a vice president. Charles F. Rockwell, New York, was re-elected secretary-treasurer.

Newly elected to the executive committee for a three-year term are H. G. Ingersoll, Ingersoll Steel & Disc Co., New Castle, Ind.; Philip Rogers, Millers Falls Co., Greenville, Mass., and Stanley Woodward, Ruberoid Co., Baltimore.

Glenn E. Jennings, Wright & Wilhelmy Co., Omaha, Nebr., was elected president, National Wholesale Hardware association. W. W. French, Moore-Handley Hardware Co., Birmingham, Ala.; F. F. Thomson, The Diggs Co., Sacramento, Calif., and A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind., were elected vice presidents. Newly elected members to the executive committee include John M. Holmes, Holmes Hardware Co., Pueblo, Colo.; W. P. Tracy, Tracy-Wells Co., Columbus, O., and C. R. Watkins, Watkins-Cottrell Co.,

Structural Steel Industry Is Lauded by Defense Chiefs

■ CO-OPERATION by the structural steel industry with the government was recognized last week when W. S. Knudsen and E. R. Stettinius Jr., members of the national defense advisory commission, wired messages to the American Institute of Steel Construction, in convention in White Sulphur Springs, Va.

"We have an enormous task ahead of us," said Mr. Knudsen. "Before production can be stepped up to where we want it we need construction. I know I can depend on you for continued co-operation."

Mr. Stettinius stated: "Please accept my congratulations and thanks for the splendid co-operation your industry is giving in the national defense program. It is most encouraging in view of the fact that the steel fabricating industry will be called upon to take an important part in the program, in building plants, shipways, bridges and highways."

The institute formally adopted resolutions pledging its fullest support to the government.

"We must consider seriously whether our nation will gain more from compulsion or from suasion," said C. G. Conley, president, Mt. Vernon Bridge Co., Mt. Vernon, O., and president of the institute, in his opening address.

"Can adequate rearmament be effected under a system of free enterprise requiring as it does adequate returns and profits—by suasion—or must we adopt a system of coercion and confiscation of profits? Our industry has as much at stake in the answer to that question as any other industry. In the excitement of the moment, I hope our nation will not accept the wrong answer.

Must Recognize Profit Motive

"It resolves to a simple formula. On the one side we have coercion and dictatorship. On the other we have suasion and democracy. On the one side we have state socialism. On the other we have free private enterprise. If we are to maintain the latter we must frankly recognize the profit motif and defend it. Some of the efforts of our government are undoubtedly intended to do just that.

"An avowed enemy of price inflation has been named to the advisory commission on national defense. His efforts might well protect us from the rapacity of the greedy and, in keeping profits to a reasonable level, insure a healthy respect for free enterprise.

"His work, however, cannot be successful if all of us do not support him. This is our opportunity to prove to the public that profits can be kept at a reasonable level. First, of course, it is our duty to prove that we can make any kind of profits at all. During the past ten years our profits have been marked by their omission rather than by their commission.

"The toll of bankruptcies has been consistent and persistent ever since 1930. The past year showed no improvement in that regard, and it is my experience that prices are still far below a fair level of costs in our industry. That condition probably offers us no great reason for wishing the present order of things to continue. It renders all arguments for a free enterprise sterile. It shows to what depths we have gone, how unfit we are to work for the restoration of true democratic institutions."

Structural Capacity Sufficient

In referring specifically to the defense program Mr. Conley said:

"The requirements for fabricated structural steel undoubtedly will be large, but large as the requirements may be, the capacity of our industry will not be overly taxed even though normal civilian requirements for structural steel should continue."

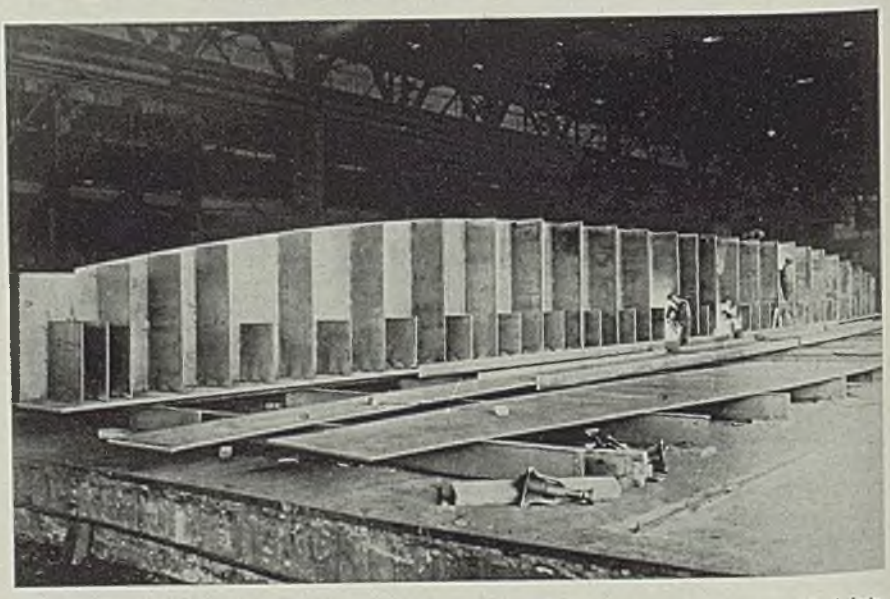
"The structural steel fabrication industry has been lagging behind, and only with the regeneration of building will it recover to any considerable extent," V. G. Iden, secretary, stated. "The trend, however, was suddenly reversed in the late spring and early summer when the United States decided to embark upon the defense program. To prepare for that it was first necessary to rebuild our industries, for which work the services of this industry were immediately required."

The first eight months of 1940 witnessed a gain of 5 per cent in general construction activity over the same period of 1939. This gain was built up in the months of July and August, due to defense activities.

Structural steel bookings closely followed this trend. For the first eight months of 1940 they totaled 919,019 tons, a slight gain over the same period of 1939. With the tonnages in view the year should, however, show a marked increase over 1939. Sales in the past eight months have been equally divided, 50 per cent each between government (federal, state and municipal) and private industry. In 1938, 59 per cent came from government, and in 1939, 52 per cent.

Approximately 125,000 tons of structural steel awards have entered into the defense program up to Sept. 1, in the form of work direct for the government, such as hangars and

45-Ton Crane Girder Fabricated by Welding



■ Steel plates ranging in thickness from 7/16 to 1¼ inches are being welded into a 45-ton girder for an overhead traveling crane at Cleveland Crane & Engineering Co.'s Wickliffe, O., plant. Girder's span is 105 feet and height is more than 8 feet. Reinforcing diaphragms are welded not only to the web plates but also to the top plate and are spaced so close that they alone will support the trolley rails without depending on the top plate

airstation facilities, buildings at army and navy bases, and for plant facilities for turning out defense requirements in the line of airplanes and motors, tanks, ammunition, powder and the like.

If defense is carried out on the present planned basis, careful estimates would indicate the total yearly expenditures through 1946 will show as follows:

Fiscal Year,

1941	$5,000,000,000
1942	8,115,000,000
1943	7,652,000,000
1944	6,451,000,000
1945	4,778,000,000
1946	4,701,000,000
Total	$36,697,000,000

"Of this sum it is estimated over a billion dollars will be spent directly by the government to build defense industry plants and to furnish the housing for defense workers."

National defense is already dislocating the normal economy of the United States to a degree little realized by business men, according to Edwin B. George, economist, Dun & Bradstreet Inc., New York, who addressed the convention.

"Among many self-evident truths supporting our rearmament program two stand out," he said. "First, in a world of violence, a nation with our stake in life must protect it. Second, no country can throw ten to fourteen billion dollars into miscellaneous, unproductive activities without something happening to its financial structure, its standard of living, and even its many self-indulgences which perhaps, just conceivably, it would never relinquish except in the purifying heat of crisis . . .

Troubles Not Yet Ended

"The partial replacement of competitive bidding by negotiated contracts does not mean that sellers and buyers may now expect to live to a serene and untroubled old age, nor that the economic results will all be good. An automatic system is being replaced by a discretionary one and where there is discretion there can be differences of opinion and friction . . .

"For the same reason priorities have so far been left on a voluntary and co-operative basis. Otherwise the pressure toward speculative inventory buying and artificially high prices would probably be much heavier than the exigencies actually demand. Also under a voluntary system manufacturers will be free to meet emergencies in their own way, and out of their traditional ingenuity, rather than through compulsion of broad and unfeeling plans superimposed on them from the top. . .

"Both the consumers' and the price stabilization divisions of the defense commission seem to be alert to the fact that one of our major hazards is not immediate price inflation but the probability of it in the face of the intensified demand that could flow from inadequate capacity in later stages of the rearmament program."

Steel required for the defense program is plentiful and no shortage is likely to develop, according to L. W. Moffett, Washington correspondent for *The Iron Age*, who analyzed outstanding projects and interpreted them in terms of steel tonnages.

Paul Shorb, member of a firm of Washington tax consultants, explained features of the new tax legislation affecting industry.

J. T. McGavin, Yale university bureau for street traffic research, presented an optimistic outline of the large and developing market for parking garages as disclosed by a nation-wide survey just completed. He said:

"This market is a new and distinct one which has never been developed, and it is of interest to speculate on its potential value to the structural steel industry. Just as a rough guess at the potential structural steel tonnage involved, we can reasonably assume an average potential market for 15 units of 200 cars each in our 93 cities having a population of over 100,000.

"In the remaining cities of the land, it can be assumed that the existing market would be equivalent to the market in all cities over 100,000 population. We therefore have an estimated total of 2790, two-hundred car structures which provide 558,000 stalls capacity. Assuming $200 per car space investment this would represent a potential market of approximately $100,000,000 in new structures.

"Assuming 10 per cent of this potential market will be for fabricated steel this would represent a $10,000,000 market. In terms of tonnage, assuming $125 per ton this market will be 80,000 tons of fabricated steel."

Charles N. Fitts of Boston, one-time president of the institute, who retired from the industry last year, addressed the closing session, "In Retrospect." He predicted only a moderate level of business and no resumption of the boom experienced in the 20's. Officers were re-elected.

Carborundum Exhibits

■ The Carborundum Co., Niagara Falls, N. Y., inadvertently was omitted from STEEL's (issue of Oct. 14, p. 237) directory of exhibitors at the National Metal Show being held in Cleveland, Oct. 21-25. The exposition has three Carborundum exhibits, conducted by the company's Abrasive, Refractory and Globar divisions, all located in booth E-32.

Auto Industry Pledges Aid to Plane Builders

NEW YORK

■ THROUGH the Automobile Manufacturers association, the entire auto industry last week adopted a resolution pledging additional aid to the defense program from the standpoint of aviation procurement. A committee will be named to cooperate with auto industry, aviation industry, tool and die plants and autobody shops, in listing facilities adaptable to airplane production.

Speaking at an economic forum conducted by Alfred P. Sloan Jr., last week, W. S. Knudsen, former GM president, said the entire output of the machine tool industry for the next year, estimated at about $500,000,000, already is sold out. This half-billion figure compares with yearly production eight years ago of $130,000,000 worth of machines.

Pays Tribute to Private Enterprise

Dr. Sumner H. Slichter, professor of business economics, Harvard university, Cambridge, Mass., paid tribute to private enterprise in the defense program.

"It is encouraging," he said, "to look back to the first World war when the steel industry in five years increased its capacity by 35 per cent, despite the fact that never before 1914 had it run as high as 80 per cent over any extended time. Willingness to add low-cost capacity at a time when economic visibility is poor, in confidence that ingenuity and imagination will develop markets for that capacity after the period of armament is over—that willingness is the most important thing in making this defense program a success under private enterprise."

Among the 450 business leaders in attendance at this economic forum were E. P. Bullard, Bullard Co.; W. W. Holloway, Wheeling Steel Corp.; H. W. Alden, Timken-Detroit Axle Co.; Harry S. Brown, Foster-Wheeler Corp.; W. F. Detwiler, Allegheny-Ludlum Steel Corp.; Raoul E. Desvernine and Fred B. Hufnagel, Crucible Steel Co. of America; Frank Purnell, Youngstown Sheet & Tube Co.; Charles R. Hook, American Rolling Mill Co.; Eugene G. Grace, Bethlehem Steel Co.; Roy A. Hunt and Arthur V. Davis, Aluminum Co. of America; Tom M. Girdler and R. J. Wysor, Republic Steel Corp.; Ernest T. Weir, National Steel Corp.; William A. Irvin and Bradford B. Smith, United States Steel Corp.; Edward G. Budd, Edw. G. Budd Mfg. Co.; William E. Umstattd, Timken Roller Bearing Co.; Howard Coonley, Walworth Co.; Frank J. Tone, Carborundum Co.; and J. F. MacEnulty, Pressed Steel Car Co. Inc.

FINANCIAL

REPUBLIC STEEL EARNS $6,183,880 IN THIRD QUARTER

■ REPUBLIC STEEL CORP., Cleveland, reports consolidated net profit in the quarter ended Sept. 30 was $6,183,880 after deduction for all charges. Federal income taxes were deducted in accordance with law in effect at the quarter's end, with no provision made for tax legislation subsequently enacted.

Third quarter profit, equal after dividend requirements on 6 per cent prior preference and 6 per cent preferred stocks, to 96 cents per common share, compared with $2,815,339 or 38 cents per share on common in last year's third quarter. In period ended June 30 net profit was $3,337,730 or 47 cents per common share.

Aggregate net profit for nine months ended Sept. 30 was $12,633,333, topping earnings for any previous full year, and substantially exceeding $9,586,922, former peak, earned in 1936. This was equal to $1.86 per share on common, against $3,898,651 or 36 cents per common share in the period a year ago. Nine months' net loss in 1938 aggregated $8,306,437; net profit for the period in 1937 was $9,291,470.

Truscon Steel Co., Youngstown, O., a Republic subsidiary, earned a net profit of $363,294 in the third quarter. Net income was after provision for depreciation, other charges including repairs and maintenance expenses and estimated income taxes on basis of the law in effect Sept. 30. In the quarter last year, Truscon earned a net profit of $181,832.

SHARON STEEL CORP.

Third quarter net profit earned by Sharon Steel Corp., Sharon, Pa., was $365,975 after all charges and provision for federal income taxes at the new rates. It was nearly equal to $388,903 net income earned in the first six months this year. September quarter net was equal to 74 cents per share on common, and compared with a net loss of $59,483 in the period last year. Net income for quarter ended June 30 was $79,327 or one cent per share on common.

Aggregate net income for first nine months this year, computed from quarterly reports, was $754,878 and compared with a net loss aggregating $200,028 in the corresponding 1939 period.

CONTINENTAL STEEL CORP.

Continental Steel Corp., Kokomo, Ind., reports consolidated net profit for quarter ended Sept. 30 was $139,312 after depreciation, interest, federal income taxes at the new rates and provision of $44,000 for future inventory decline. It was equal to 53 cents per share on common after provision for dividend requirements on the corporation's 7 per cent preferred.

September period income compared with net profit of $198,138, equal to 83 cents per common share after deduction of a $150,000 reserve for contingencies, earned in the third period last year. June quarter net income was $141,339 after provision of $57,000 for future inventory price decline, and was equal to 54 cents per common share.

Nine months net income totaled $492,107 after provision of $163,000 for future inventory decline. This was equal to $1.96 per common share and compared with net profit of $730,445 or $3.07 per share on common in the period last year.

ALLEGHENY LUDLUM STEEL

Allegheny Ludlum Steel Corp., Brackenridge, Pa., reports net profit for September quarter, after federal income taxes at the new rate, was $1,300,582 or 99 cents per share on common after preferred dividend requirements. This compared with net income of $327,772 or 21 cents per common share in the period last year and a reported net profit of $1,008,121, equal to 76 cents per common share in the June, 1940, quarter.

Net profit for the first half, previously reported as $1,974,719, according to the company's statement, has been reduced $81,428 to provide for the retroactive increase in federal income taxes. Profit in first nine months was $3,193,873 before excess profits tax adjustments, estimated at $412,588. Nine months net, after all charges, was estimated at $2,781,285 or $2.07 per share on common, against $682,094 or 40 cents per common share in the period last year.

KEYSTONE STEEL & WIRE CO.

Third quarter net profit earned by Keystone Steel & Wire Co., Peoria, Ill., was $280,409, equal to 37 cents per share on capital stock. This compared with $273,922 net income, equal to 36 cents per share, earned in the period last year.

Calculated aggregate earnings in first nine months this year, computed from quarterly reports, were $1,006,197, equal to $1.33 per capital share; in the 1939 period, calculated net income was $972,269 or $1.28 per share.

Keystone's fiscal year ended June 30.

A. M. CASTLE & CO.

A. M. Castle & Co., Chicago, steel distributor, reports net profit of $123,420 for quarter ended Sept. 30, after depreciation, federal income taxes at new rate and all other charges. Equal to 51 cents per capital share, this compared with net income of $65,249 or 27 cents per capital share in the September quarter last year. In June 1940 quarter, net income was $92,319 or 38 cents per share.

Aggregate net profit in first nine months this year was $315,938, or $1.31 per share and compared with $146,213 or 61 cents per share in the 1939 period.

No provision was made for excess profits taxes, as no liability was indicated by the nine months' total net earnings.

Welding Award Program Opportunities Outlined

■ Opportunities available through participation in the $200,000 industrial progress award program, sponsored by the James F. Lincoln Arc Welding foundation, are discussed in a 24-page booklet, *We Who Work at Our Industrial Jobs.*

Written by E. C. Powers, assistant secretary of the foundation, the booklet points out how industrial progress has not only raised living standards but created millions of new employment opportunities. Further industrial progress, it continues, is being stimulated by the welding progress program.

Booklet includes a plan for participating in the program.

Welding Society Awards Lincoln Gold Medal

■ H. J. French and T. N. Armstrong, metallurgists of development and research division, International Nickel Co. Inc., New York, have been awarded the Lincoln gold medal of the American Welding society for 1940 for their technical paper entitled "Weld Hardening of Carbon and Alloy Steels." Presentation of the medals will be made at the annual meeting of the society, Monday morning, Oct. 21, in Hotel Cleveland, Cleveland, during the National Metal congress, Oct. 21-25.

154 Electric Trucks Booked in September

■ September bookings of electric industrial trucks and tractors totaled 154 units, highest for the year, according to the Industrial Truck Statistical association, Chicago.

Total net value for chassis only was $550,206.50. Bookings included 11 nonelevating platform trucks, 129 cantilever type trucks, 8 tractors, 5 cranes and 1 special rack handling truck.

Interested parties may obtain further details of this report by writing to the association, 208 South LaSalle street, Chicago.

Machine Tool Operations 94.9% of Capacity

■ September machine tool operations were 94.9 per cent of capacity, compared with 93.3 per cent in August, according to the National Machine Tool Builders' association, Cleveland. The rate is the highest in the association's history.

The industry's capacity, measured in terms of payroll hours, continues to increase, the indication at the end of the month being 41 per cent above September, 1939.

Fourth Quarter Car Requirements Higher

■ National forecast by the regional shippers' advisory boards for fourth quarter indicate an increase in freight car requirements of 7 per cent over final quarter of 1939. Except for grain, fresh fruits and sugar products every classification shows a higher total in the estimates.

Automobiles, trucks and parts have the greatest probable increase, 22.1 per cent, and ore and concentrates second with 20.6 per cent. Machinery and boilers are a close third with 19.9 per cent. Iron and steel products will increase 11.1 per cent. Coal and coke shipments are estimated to be 3.9 per cent larger. An indication of the activity of farming is shown in an increase of 14.4 per cent in shipments of agricultural implements and vehicles, other than automobiles.

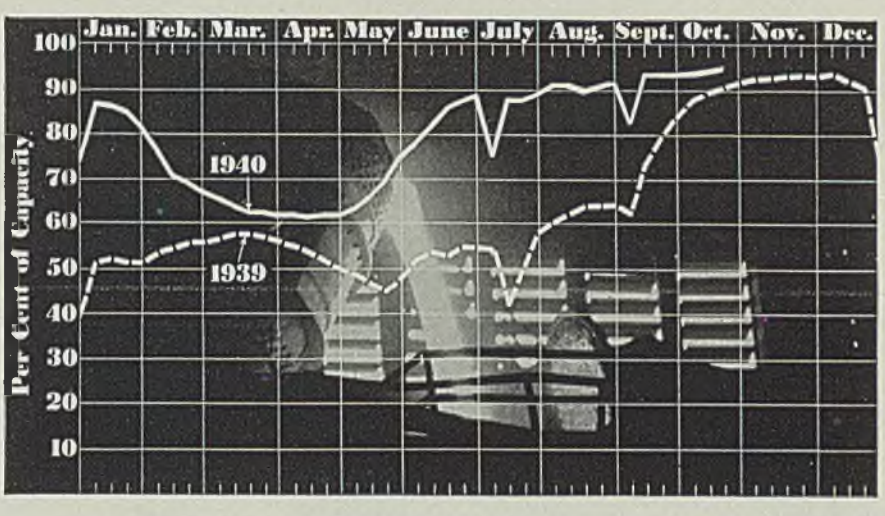
Blaw-Knox To Make Cast Armor for Tanks

■ Blaw-Knox Co. Pittsburgh, has received a substantial order for furnishing cast armor for tanks for the government.

Blaw-Knox, through its Union Steel Casting division, has been one of the leaders in development and research work in this country for the production of cast armor. Long before the present defense program took shape experiments were made, and when the United States became active in a defense program these experiments were followed by actual and successful tests by the government.

Armor castings produced by Blaw-Knox passed the prescribed tests and as a result it is expected that considerable additional business will be received and the company will be active in the production of armor where the cast type is suitable.

While cast armor has been used to some extent abroad, it is a comparatively new development in this country. Because it can be streamlined, cast into irregular shapes and produced rapidly and in quantities, cast armor supplements the use of rolled armor plate.



PRODUCTION... Up

■ STEELWORKS operations last week rose ½-point to 95 per cent, highest since June, 1929. Four districts increased production, two dropped back because of furnace repairs and six maintained their rates. A year ago the rate was 91 per cent; two years ago it was 51½ per cent.

Birmingham, Ala.—Steady at 97 per cent for the fifth week, with continued high production necessary to meet demands.

St. Louis—Continues at 82½ per cent for the third week, the same rate scheduled for this week.

Cincinnati—Unchanged at 90 per cent, which is expected to continue in the effort to meet demand for sheets.

Cleveland — Open-hearth repairs interrupted production for a loss of 2½ points to 85½ per cent. This is expected to be regained this week.

Central eastern seaboard — At practical capacity of most producers, the production rate holds at 93 per cent.

Buffalo—Sustained effort to meet deliveries holds production at 90½ per cent, which has been maintained since mid-August.

New England—Loss of 7 points to 85 per cent resulted from furnace repairs. Rebound to 90 per cent or more is expected this week.

Pittsburgh—Rise of 1½ points to 90 per cent, which is expected to continue through this week.

Wheeling—Gain of 1 point to 98 per cent indicates effort of producers to meet heavy demands.

Chicago—Advance of 1 point to 99 per cent. This equals the all-time high established the week of Aug. 26.

Detroit—Held at 96 per cent, close to practical capacity.

Youngstown, O.—Up 2 points to 90 per cent, highest for the year, with schedule of 91 per cent for this week, close to the practical limit. Carnegie-Illinois Steel Corp. has added one open hearth at Farrell plant and Youngstown Sheet & Tube Co. suspended two for one day for repairs.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Oct. 19	Change	Same week 1939	Same week 1938
Pittsburgh	90	+ 1.5	89	39
Chicago	99	+ 1	89	45
Eastern Pa. ...	93	None	72	32
Youngstown ..	90	+ 2	94	57
Wheeling	98	+ 1	93	54
Cleveland	85.5	— 2.5	90	64
Buffalo	90.5	None	86	49
Birmingham ..	97	None	90	57
New England..	85	— 7	100	70
Cincinnati	90	None	88	70
St. Louis	82.5	None	77	45.5
Detroit	96	None	96	79
Average	95	+ 0.5	91	51.5

21,500,000 Tons Scrap Exported Since 1933

■ More than 21,500,000 net tons of iron and steel scrap has been exported from United States since January, 1933, over half of which went to Japan, according to American Iron and Steel institute. Total scrap tonnage exported since 1933 is more than five times as much as total scrap exports in the first 32 years of the century. Prior to 1900, exports of scrap were negligible.

During June, July and August this year, 1,109,000 tons of scrap was exported, or 43 per cent more per month than during the first five months of the year. Japan continued to take 31 per cent of the total during those three months, but ranked second to Great Britain, which took 44 per cent. Canada's share of scrap exports rose sharply to 17 per cent of the total. Exports of scrap to continental Europe dropped off practically to nothing after the middle of June.

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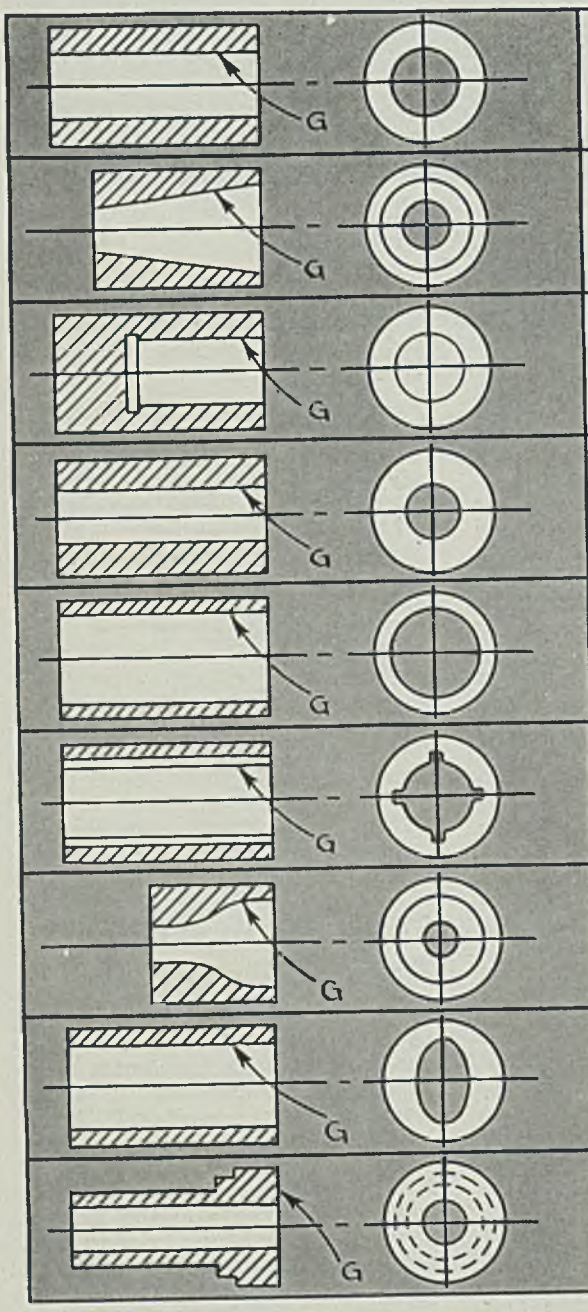

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Windows of *WASHINGTON*

By L. M. LAMM
Washington Editor, STEEL

Rules To Deny Wagner Act Violators Defense Awards.

Contracts May Be Held From Lowest Bidders.

Metals Reserve Co. Purchasing Strategic Minerals.

Supreme Court To Review Bethlehem Shipbuilding Case.

WASHINGTON

■ ACTING United States Controller General Elliott has ruled national defense contracts may be with-held from Wagner act violators even though they quote the lowest figure when bidding competitively.

The ruling, directed to the secretary of war, is expected to clarify the government's policy on the award of defense production contracts to firms which are accused of violating the Wagner act or other statutes governing wages and working conditions.

Decision was in response to a request from the secretary of war for a ruling on competitive bid awards in the light of the defense commission's policy that work carried on as a part of the defense program should comply with federal statutory provisions affecting labor, including the national labor relations act.

The secretary of war said there seemed to be no doubt that consideration might be given to the defense commission's policy where contracts were negotiated without advertising for competitive bids. "However," he continued, "the question has arisen as to whether consideration may be given to these principles in the award of contracts when resort is had to formal advertising.

"That is to say, may a low bid received in response to a formal invitation for bids, which is otherwise acceptable, be rejected because an award to the bidder would violate any one or all of the principles adopted by the advisory commission?

"The co-ordinator of procurement, Donald Nelson, feeling that the use of formal advertising in many cases is preferable to negotiation, provided that the principles enunciated may be properly incorporated in formal advertising, has recommended that this question be presented to you."

After quoting the defense legislation statute on purchases, which permits them to be made with or without advertising, Mr. Elliott said:

"This express authority to negotiate without advertising such contracts as may be deemed necessary to carry out the purposes specified in the section comprehends the lesser authority to utilize advertising to the extent administratively deemed appropriate in making contracts under such section without restricting final administrative determination of the bidder to whom the contract should be awarded.

"Hence, in such cases an administrative election to advertise rather than to negotiate with a single contractor does not necessarily require making the award to the lowest bidder regardless of any or all other considerations. As all bids may be rejected and a contract negotiated with any one of the bidders or with a non-bidder on the terms advertised or on modified terms, within authority to negotiate such contracts without advertising, there would appear no legal objection to the rejection of the bids of one or more lower bidders and the awarding of the contract to a higher bidder consistently with the principles which properly may be administratively applied in the negotiation of contracts without advertising . . . . To the extent that such contracts properly may be negotiated without advertising, they may be made on the same conditions after advertising."

Mr. Elliott's ruling adds another chapter to a controversy that has raged since the defense commission's enunciation of labor policy was followed by an opinion of Attorney General Jackson which held in effect that a firm adjudged by the labor board in violation of the labor act should be held to be guilty until the board finding was reversed by a court.

When the Smith house committee held a brief investigation of this situation to determine what effect the defense commission's policy would have on contracts, Assistant Secretary of War Patterson said that the restrictions could be applied when contracts were awarded without bids, but that it was not believed that the laws governing competitive bidding would permit the injection of labor law compliance. The Elliott ruling, however, removes any obstacle in that direction.

RFC SUBSIDIARY PURCHASES VITAL DEFENSE MATERIALS

Strategic minerals for the national defense program are being purchased by the Metals Reserve Co., a subsidiary of the Reconstruction Finance Corp., and by the procurement division of the treasury department.

Up to the time the metals company was organized June 28, procurement division purchased all of the strategic minerals, but congress in one of its many recent defense bills provided for the purchase of manganese and tin by the RFC. The latter created the metals company

for the specific purpose of buying the commodities mentioned.

Both the metals company and the procurement division of the treasury department consider the purchase of strategic minerals as national defense secrets and, therefore, neither is making public definite information regarding its purchases. It is understood, however, on good authority that the metals company has purchased about 800,000 tons of manganese ore, 3000 tons of tin, 6000 tons of chrome, and 6000 tons of antimony.

At the time the metals company was organized, the RFC announced an agreement had been reached with the international tin committee to buy 75,000 tons of tin to hold as reserve stock, for which it was to pay 50 cents a pound, c.i.f., United States ports to be specified by the company. Announcement was also made at the same time that the RFC had authorized loans to this company amounting to $100,000,000 with which to buy and carry the tin and other metals.

COURT GRANTS GOVERNMENT SHIPBUILDING CASE REVIEW

United States Supreme Court last week granted government's application to review litigation challenging Bethlehem Shipbuilding Corp.'s right to collect additional $5,270,000 on shipbuilding contracts fulfilled during the World war, and on which $113,000,000 has been paid. Government is asking part of this money be returned.

Rebuffed in lower courts on the case, pending 15 years, government asked for Supreme Court review on grounds Bethlehem profits had been "inordinate and unconscionable" and the issue had an important bearing on the current vast defense program.

Although holding against the government, lower courts had condemned terms of the contracts and Attorney General Jackson said outcome in Supreme Court undoubtedly would influence administration of the conscription act provision permitting government to take over industries when necessary to obtain defense material at a reasonable cost.

Justices Stone, Roberts and Murphy took no part in the case.

Bethlehem litigation involves two suits growing out of construction of 83 cargo vessels and tankers for the wartime merchant fleet, government alleging it was bound by necessity to meet terms now declared exorbitant.

Government in 1925 sued Bethlehem Steel, the parent company, and certain subsidiaries for an accounting and recovery under the contracts, and Bethlehem Shipbuilding Corp. countered with a claim for $7,691,000 as an unpaid "bonus." A special master sitting in the case recommended dismissal of the government bill, and ruled judgment for $5,270,000 should be entered for Bethlehem.

In negotiating for the ships, according to government, Bethlehem refused to contract on a "lump sum" basis, but demanded actual cost of construction, plus a fixed profit of about 10 per cent of the estimated cost, plus a "bonus for savings" equal to half the amount by which actual cost fell below estimated cost.

Estimated cost was fixed at $119,750,000; actual base cost was $92,990,000, a difference approximating $27,000,000 according to the government. The company collected more than $20,000,000 profits including more than $8,000,000 under the "bonus for savings" arrangement.

Government said the builder was in a better position to figure on the estimated cost than its own representative, the Emergency Fleet Corp. Company declares "unprecedented conditions surrounding labor and materials" made closer figuring impossible, and the special master also decided the estimate "represented reasonable estimates of probable cost."

Court of appeals said that since the Fleet Corp. knew how large Bethlehem's estimates were, the contracts could not be so extortionate as to be unenforceable.

AIRCRAFT STANDARDIZATION PROGRAM IS INAUGURATED

President Roosevelt last week appointed a four-man committee to put a new airplane standardization program into effect. Members include Secretary of the Treasury Morgenthau, Secretaries Knox and Stimson and William S. Knudsen of the defense commission.

Secretary Morgenthau reported design of British and American warplanes under construction in United States is to be standardized in an effort to speed production for both nations.

Factories now building one model of pursuit plane for Britain and another for United States' army or navy will concentrate on one design. The program, he declared, will extend to gun calibers, parts and all phases of aircraft construction.

Army and navy technical experts will pass on details of the standardization program and the British government has been asked to send ten leading technicians to confer with United States experts, Mr. Morgenthau said.

In changing designs, American army and navy requirements must be adhered to, the treasury chief said. As a secondary consideration, efforts will be made to conform to British desires.

CO-ORDINATED WAREHOUSING PROGRAM IS UNDERTAKEN

Ralph Budd, national defense advisory commission member in charge of the transportation division, has announced a co-ordinated warehousing program is being undertaken.

Existing warehouse space, said Mr. Budd, will be used first. Next, existing buildings suitable for warehouse purposes will be utilized. In emergencies, government may have to undertake construction.

Defense commission has delegated co-ordination of warehousing to the transportation division, which will work with the army and navy, and other government agencies, in warehousing products for the defense program. Harry D. Crooks, Chicago, was appointed consultant on warehouse activities by Mr. Budd, and will be in direct charge of the work. Mr. Crooks is president, Crooks Terminal Warehouses Inc., Chicago, New York, Kansas City and Los Angeles.

Survey of existing warehouse facilities now available will be made immediately. Adequate facilities are essential that freight cars, ships, and trucks, may be unloaded speedily and kept in service.

FAIR LABOR ACT EMPLOYE CLASSIFICATIONS REDEFINED

Through amendments to existing regulations, Col. Philip B. Fleming, wage and hour division administrator, has announced a new classification of employes who need not be paid overtime after 40 hours a week.

Amended regulations, which redefine terms "executive," "administrative," "professional" and "outside salesman" will add several hundred thousand to the group exempted from hours provisions of the fair labor standards act. New classifications go into effect Oct. 24, when the standard work week becomes 40 hours, and will apply to nearly all establishments engaged in interstate commerce.

Most important change is a separate definition for "administrative" employe, previously defined jointly with "executive." As defined, an executive remains one whose primary duty consists in management, and who is paid $30 or more a week.

Under new regulations, administrative employes are those whose duties, while important and linked with management, are functional rather than supervisory, and who are paid a "salary commensurate with the importance supposedly accorded the duties in question." This salary, under the regulations, must not be less than $200 a month.

MEN of INDUSTRY

■ EARL N. GRAF, former manager, Pittsburgh branch, John A. Roebling's Sons Co., Trenton, N. J., has been appointed assistant manager of sales, wire rope division, with headquarters at Trenton. Mr. Graf gained his first business experience with the former Carnegie Steel Co., after having spent three years studying metallurgy and chemistry at Carnegie Institute of Technology. He later joined Midvale Cambria Steel Corp., now Bethlehem Steel Co., and in 1918 opened a branch in Philadelphia for Beaver Refining Co. His first association with the Roebling company was in 1919 when he took over specialized wire rope sales for Frick & Lindsay Co., a Roebling distributor in Pittsburgh, and when Frick & Lindsay became the Frick-Reid Supply Corp., Mr. Graf remained as wire rope specialist. In July, 1938, Mr. Graf was placed in charge of wire rope sales of Roebling's Pittsburgh branch, a year later becoming manager.

♦

J. S. Ronay has returned to his duties with the Tata Iron & Steel Co. Ltd., Jamshedpur, India, after his vacation in the United States.

♦

James H. McNeal, associated with Weirton Steel Co., Weirton, W. Va., since 1918, serving a number of years as assistant purchasing agent, has been appointed purchasing agent. He succeeds the late E. H. Kern.

♦

Arthur Mackmann, former works manager, Foote Bros. Gear & Machine Corp., Chicago, has been elected vice president in charge of manufacturing. He has been with the company since 1928.

♦

Roy C. Ingersoll, president, Ingersoll Steel & Disc division, Borg-Warner Corp., Chicago, was nominated for president, Illinois chamber of commerce at the twenty-second annual meeting of the organization recently.

♦

L. S. Cope has been appointed development engineer, Oliver Iron & Steel Corp., Pittsburgh. His duties will include technical improvement of the present line of Oliver products, development of new products and co-operative service with Oliver customers.

♦

Ward Walcott, Granite City, Ill., has been elected president, Amalgamated Association of Iron, Steel and Tin Workers, Pittsburgh. He will

Earl N. Graf

assume his duties Jan. 1 and will move to Pittsburgh. Louis Leonard has been re-elected secretary-treasurer, while William Grey, heretofore assistant secretary-treasurer, has been elected vice president.

♦

R. F. Herr has joined Brainard Steel Corp., Warren, O., as assistant to the president. He was associated with Truscon Steel Co., in various capacities, from 1925 to 1930 when he was sent to Japan as works manager, Oriental Steel Products Co., a Truscon subsidiary. Returning to this country in 1937 he spent the following three years as a coordinating engineer with Truscon at Youngstown. In the spring of this year he took up consulting engineer work, being associated with several steel companies in the Mahoning valley, Pittsburgh district, as well as several Canadian companies.

Raymond F. Hadley

Who was awarded the Beal medal at the twenty-second annual convention of the American Gas association in Atlantic City, N. J., Oct. 7-10. see STEEL, Oct. 14, p. 81. Highest technical recognition in the gas industry, the medal was presented to Mr. Hadley for contributing the best technical paper to meetings of the association the past year. Mr. Hadley is electrical engineer, Susquehanna Pipeline Co., Philadelphia

♦

John C. Phalen, Benjamin Eastwood Co., Paterson, N. J., has been elected president, New Jersey Foundrymen's association, succeeding J. W. Hannay, Barnett Foundry & Machine Co., Irvington, N. J. A. E. Winstead, Moore Bros. Co., Elizabeth, N. J., has been elected vice president and J. A. Williamson, Isbell-Porter Co., Newark, and John L. Carter, Newark, have been reelected treasurer and secretary, respectively.

♦

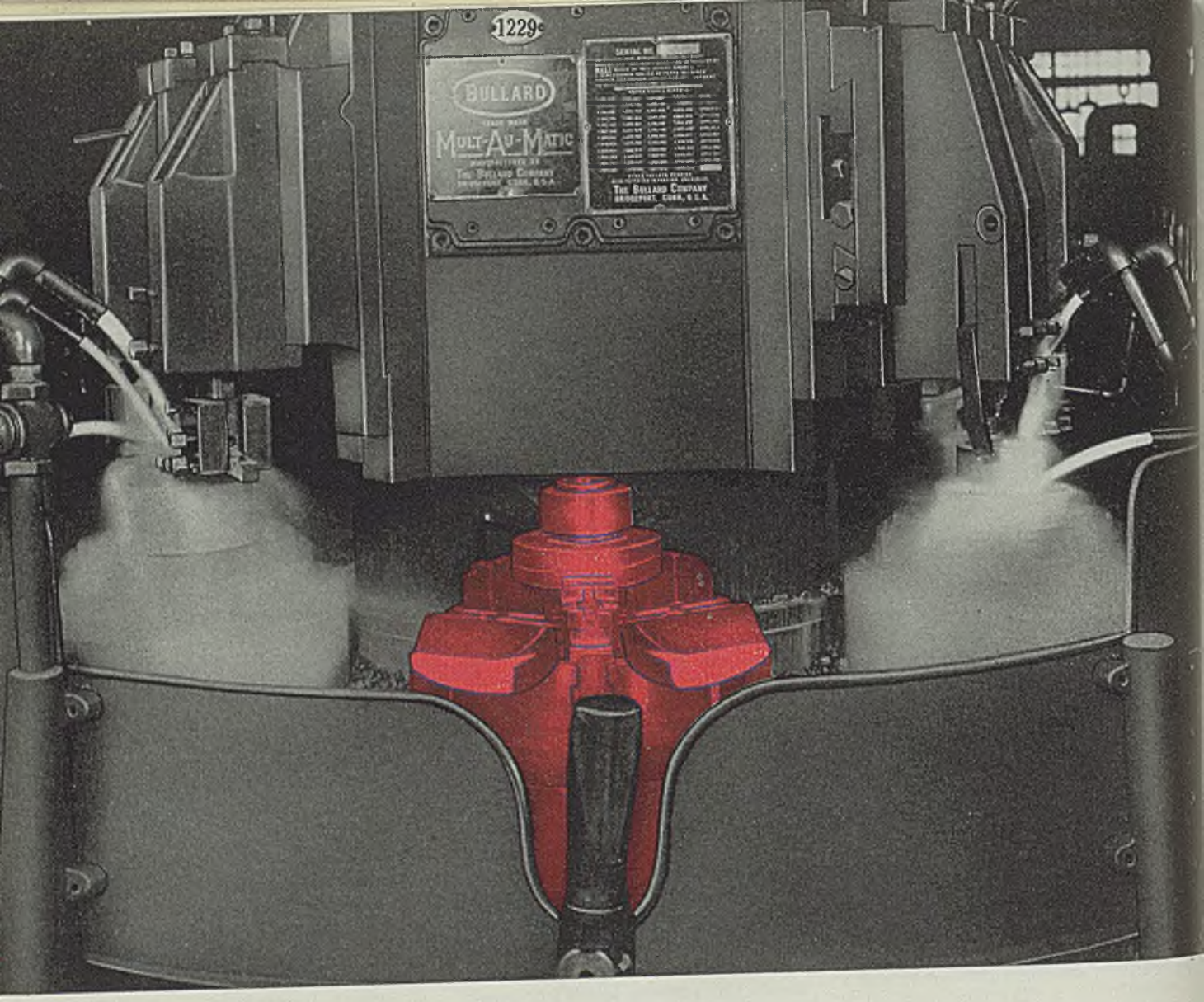
W. J. Jeffries, senior materials engineer, bureau of construction and repair, navy department, and more recently in the newly formed bureau of ships, division of research and specifications, has resigned to become chief inspector, Philadelphia ordnance district. Mr. Jeffries has been for many years a member, American Society for Testing Materials, American Society for Metals, American Welding society, and others.

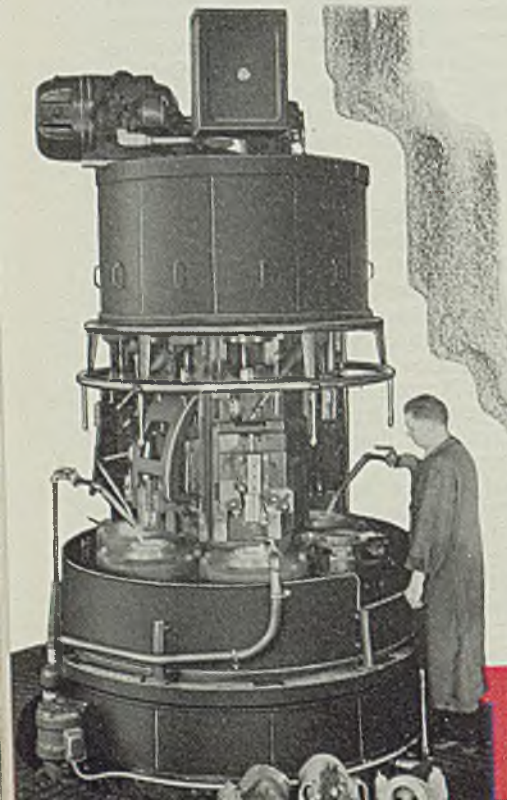
♦

C. B. Ketcham has been promoted to manager, Cincinnati office, and C. G. Jewett, manager, Columbus, O., office of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Associated with the company about 30 years, Mr. Ketcham has been salesman and manager in Indianapolis, Louisville, Ky., Dayton, and Columbus, O., the past ten years being manager at Columbus. Mr. Jewett's promotion follows his 15-year association with the Cincinnati office.

♦

George H. Bucher, president, Westinghouse Electric & Mfg. Co., Pittsburgh, and 15 other employes at the company's Pittsburgh offices received gold emblems in recognition of 30 or more years' service. Ralph Kelly, vice president in charge of sales; Roscoe Seybold, vice president and comptroller; and H. F. MacLane, director of financial accounts, were among those who received 30-year gold service buttons, while L. W. Lyons, treasurer, received a 35-year button and H. N. Mathias, general cost accountant, a 40-year ruby and gold emblem. Roland R. Davis, Thomas R. Langan, F. C. Gheen, F. L. Lee, J. W. John and J. A. Dickey were given 35-year emblems, and 30-year buttons were presented to W. D. O'Connell, W. J. Otterson, H. E. Brunk and Ella G. Richardson.





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THE BULLARD COMPAN

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Mirrors of MOTORDOM

By A. H. ALLEN
Detroit Editor, STEEL

"Cars of Tomorrow" Attract Interest at Auto Show

Cutaway Chassis Demonstrate Inner Workings.

Defense Program Dominates Most Conversations.

Easterners Generally Resigned to War's Inevitability.

Automobile Production Rises to 114,672.

NEW YORK

■ AROUND a central theme, "Salute to the Americas," the forty-first national automobile show last week unveiled to thousands of interested spectators here the industry's products for the coming year. The show was a riot of color and animated displays, and although the cars themselves were perhaps anticlimactic presentations to many, especially Detroiters, nevertheless the ceremony and color were fitting inaugurals for the new model season.

Taking a cue from the nearby World's Fair, now in its closing days, the exhibits featured numerous "spielers" and attractive feminine models to get across forcibly to the public interesting features of the new cars. Engine improvements, innovations in transmissions, styling changes and new accessories all came in for effective dramatization.

While public interest was evident in all cars on display, focal points of attention appeared to be the "cars of tomorrow" shown by Buick and Chrysler. The latter had two "surprise" models on display—the Thunderbolt and the Newport—which drew large crowds. The cars were finished just in time for the show. Orders were being accepted for them, but price tags of $8300 apiece indicated Chrysler was not particularly anxious to build up any backlog. In fact, it was gossip around the show that originally a price of $5250 had been placed on the cars, but that at this figure a loss of $2000 on each car was being incurred, so the price was boosted to $8250, $8300, $8500 or what have you?

So radical in design are these models that they warrant brief description. Bodies are produced by LeBaron and approach the ultimate in streamlining. Fenders and bodies are integral, with an 8-inch strip of corrugated stainless steel mounted the full length of the side along the lower edge of the body. Headlamps are covered with retractable covers, operated by a lever in the dash compartment. Steel top also is retractable, lowering by power under the rear deck lid which raises to permit passage of the top.

Chrysler Probes the Future

Flush-type buttons replace the conventional door handles, both inside and out. Windshield is of curved plastic. License plate frames, both front and rear, are recessed into the body, with indirect lights for illuminating them.

Mounted on Chrysler chassis, both the Thunderbolt and Newport models were the last word in streamlining, comfort and appointments. Chief point of difference was in the body style, the Newport having a longitudinal crease across each side of the body and being finished in canary yellow, while the Thunderbolt was finished in a pale blue, with all stainless steel trim.

Distinctly "novelty" types of cars and in no sense production models, they represented Chrysler's answer to Harley J. Earl's Buick "car of tomorrow" which has occasioned so much comment wherever it has been shown. Impartial comment was to the effect that the two new Chrysler models in many respects were superior to Mr. Earl's design as a concept of future trends.

Marking first time Ford had ever actively participated in the New York show, this company arranged an exceptionally attractive display in tune with the general theme, and called it the Ford Fiesta. The exhibit was conceived by Walter Dorwin Teague and his staff and showed new Ford, Mercury and Lincoln models in an exaggerated Spanish setting, featuring 18 relief murals in the Spanish motif which were unusually clever. A stage at each corner of the exhibit was the scene of brief skits emphasizing certain sales points, the scripts being nearly all in rhyme. In one corner a car was mounted on its side with the roof panel arranged to swing up out of the way to reveal life-size models seated in the car, showing the roominess.

A feature of the Packard exhibit was one car equipped with complete "cellarette"—a small bar with icemaking machinery, glasses and other necessary accoutrements.

"Cannonball" Baker, six-foot two-inch race driver, was on hand to explain interesting details of his cross-country run in the Crosley midget car.

Nash had a pretty girl who spent the day climbing into and out of a bed made up in the rear of a standard Nash model.

Graphic exhibits of the principles of fluid drive and the Olds Hydra-Matic transmission kept large crowds interested.

Pontiac featured a deep pink colored sedan with the entire forward section of the body hinged to permit its being swung up off the chassis.

Particularly interesting were the various so-called "show chassis,"

sectioned and cut away to show vital parts in operation. These chassis are remarkable examples of manufacturing ingenuity, some of them requiring several months in assembly. They are built practically from the ground up, each part either being painted or plated, engines being cutaway to show inner workings, as are transmissions, differentials, generators, in fact every unit with some inner element in motion. Special lights are mounted strategically so that all moving parts are well illuminated.

The chassis cost anywhere from $5000 up to $40,000 to build and after show time are routed around among dealers' showrooms throughout the country. Finally they are donated to some technical institution for study and disassembly by students. Each company ordinarily will build up from half a dozen or a score or more of show chassis each year, although occasionally it is possible to use them for two or three years, at least the basic elements, if no important design changes have been made.

■ ALL IN ALL, it was a busy week here in New York. The World's Fair drew over 366,000 persons on Sunday, Oct. 13, one of the largest crowds ever to attend, and ideal weather throughout most of the week was a magnet for thousands, a good many of whom naturally took in the auto show. Officially, executives declared they were well pleased with attendance and with sales at the show, although some minor grumbling was heard about the small crowd the first day.

More and more, however, it appears the New York show is becoming an incidental affair as far as the motor companies are concerned, which is probably as it should be. Residents of Manhattan seldom use their cars in their daily work, preferring the convenience of bus, subway or taxicab. Hence, many of those attending the show could not be considered representative samples of prospective car buyers. Furthermore, public announcements and displays of many of the new models already have been made throughout the country, so the New York show becomes nothing more than the official gesture that the new model season has begun.

In connection with show week, however, there is always a crowded schedule of events, such as luncheons, receptions, dinners, forums and the like which have no particular connection with the show except insofar as timing is concerned. They are the scene of a renewal of old friendships between the motor company executives and a vast fraternity of other dignitaries and representatives in fields such as politics, finance, education, publishing, advertising, entertainment and the like.

The various companies schedule receptions for the press; Mr. Sloan of General Motors has an annual luncheon, this year concerned with a forum discussion on mobilizing the economic strength of the nation; Mr. Garrett, public relations chief of GM, has an annual reception at the University Club, this year attended by nearly 1000 leading personalities in all phases of science, art and industry; Chrysler maintains a salon in the Chrysler building where all new models are on display; General Motors does likewise at the Waldorf-Astoria; the Society of Automotive Engineers holds its annual dinner during show week, this year hearing Robert P. Patterson, assistant secretary of war, speaking on the automotive industry and national defense; and other receptions and parties are scheduled by publishing companies and similar interests.

Defense Program to Fore

It is at these private affairs where the real news of the industry is to be heard. Unfortunately, however, most of them are definitely "off the record." But it is no secret to sum up general opinion which is simply that the industry is "hoping for the best." Obviously the defense program dominates nearly all conversation. The industry realizes it will probably be called upon to far greater extent than at present for manufacturing contributions, when the picture of "what is wanted and how soon it is wanted" becomes further clarified.

The fond wish is expressed, nonetheless, that somehow automobile manufacturing can carry on uninterrupted so that by maintenance of a high rate of consumer activity at least a down payment on the defense bill can be made.

In sharp contrast to popular opinion in the Middle West is the generally resigned attitude around New York that war is inevitable for this country, some persons even going so far as to maintain that this country actually has been in an undeclared war since the detention of the BREMEN here long months ago. When accused of "war hysteria," persons here stoutly deny any such attitude, preferring to classify their belief as simply a calm acceptance of fact.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1938	1939	1940
Jan.	226,952	356,692	449,492
Feb.	202,597	317,520	422,225
March	238,447	389,495	440,232
April	237,929	354,266	452,433
May	210,174	313,248	412,492
June	189,402	324,253	362,565
July	150,450	218,494	246,171
Aug.	96,946	103,343	89,866
8 mos.	1,552,897	2,377,691	2,875,477
Sept.	89,623	192,678	.....
Oct.	215,286	324,688	.....
Nov.	390,405	368,541	.....
Dec.	406,960	469,120	.....
Year	2,655,171	3,732,608	.....

Estimated by Ward's Reports

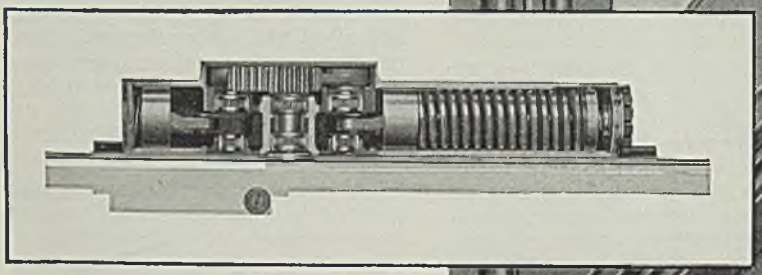
Week ended:	1940	1939†
Sept. 21	78,820	55,350
Sept. 28	95,990	64,365
Oct. 5	105,153	76,093
Oct. 12	107,957	75,860
Oct. 19	114,672	70,114

†Comparable week.

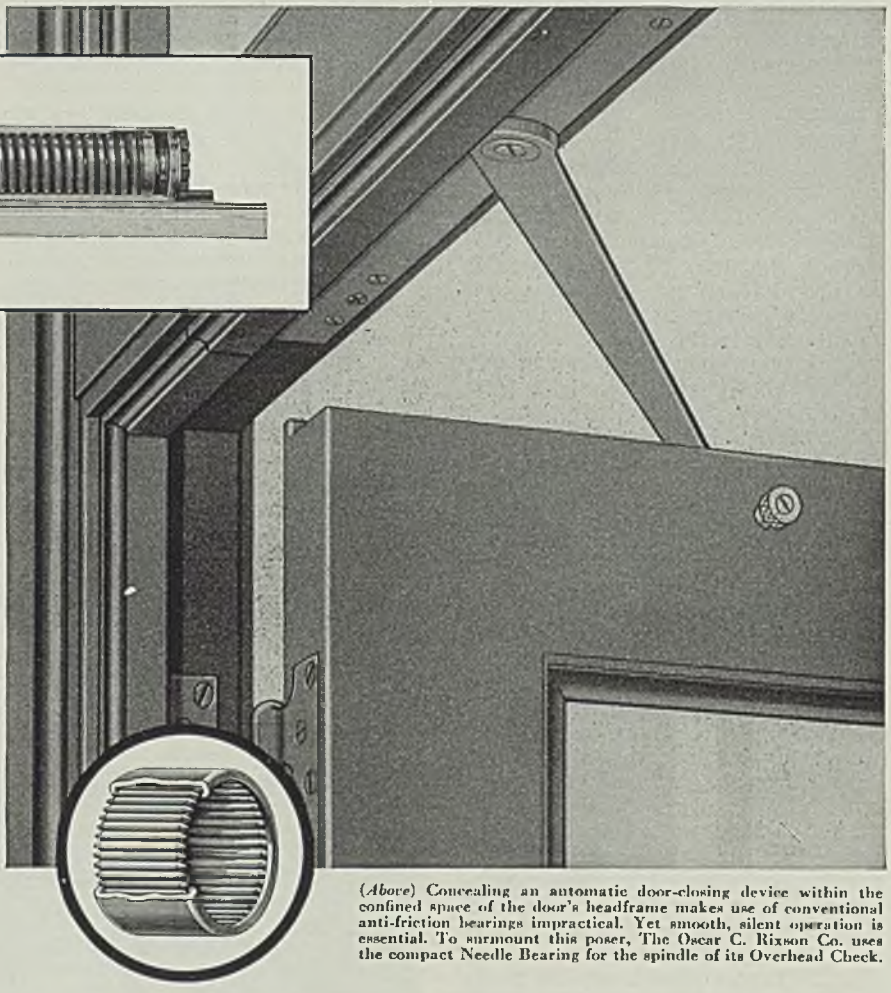
Dignitaries at Auto Show

■ Among scores of dignitaries attending General Motors' new car salon at New York's Waldorf-Astoria was former President Herbert Hoover, shown here flanked by H. H. Curtice (right), Buick general manager, and W. F. Hufstader, Buick sales manager

IN THE RIXSON CONCEALED DOOR CHECK
TORRINGTON NEEDLE BEARINGS MINIMIZE FRICTION IN MINIMUM SPACE



(*Above*) Cutaway view of the Rixson No. 220 Concealed Overhead Door Check, showing how the Needle Bearing permits full anti-friction operation in minimum space.



(*Above*) Concealing an automatic door-closing device within the confined space of the door's headframe makes use of conventional anti-friction bearings impractical. Yet smooth, silent operation is essential. To surmount this poser, The Oscar C. Rixson Co. uses the compact Needle Bearing for the spindle of its Overhead Check.

OCCASIONALLY, use of the Torrington Needle Bearing comes about as a result of finding it the *only* anti-friction bearing readily adaptable to some specific design problem. And having once used the Needle Bearing, alert manufacturers are quick to perceive its advantages—and thereafter, specify it wherever the opportunity to use it occurs. Take the case of The Oscar C. Rixson Company, manufacturers of improved mechanisms in builders' hardware. Let Mr. M. A. Reisel, of the Rixson Company, tell the story:

"In door-closing devices, bearings must be efficiently lubricated, as such devices, once installed, receive practically no care or attention. In order to improve the wearing qualities of our floor checks, where plain bearings had been previously used, and the *dimensions of the device could not be changed*, we arrived at the use of the Needle Bearing around the spindle.

"Subsequently," continues Mr. Reisel, "when we designed our No. 220 type of Concealed Overhead Check, we incorporated a total of six Needle Bearings in it, and *they have proven highly successful.* In this device, which is concealed within the door's headframe, it is essential to maintain as compact a unit as possible due to minimum space for the completed assembly; and yet be certain of eliminating friction. We found the Torrington Needle Bearing ideally suited to such requirements."

Ready adaptability to product design is typical of the Torrington Needle Bearing. With its small size, simple construction, ease of assembly and lubrication, it frequently permits simplification of design with resultant savings in space, weight and cost. Our Engineering Department will be glad to cooperate with you in adapting the high-capacity, low-cost Needle Bearing to *your* product. For information, write for Catalog No. 10. For Needle Bearings to be used in heavier service, request Booklet 103X from our associate, the Bantam Bearings Corporation, South Bend, Indiana.

The Torrington Company
ESTABLISHED 1866
Torrington, Conn., U.S.A.

Makers of Needle and Ball Bearings

New York Boston Philadelphia Detroit
Cleveland Chicago London, England

TORRINGTON
NEEDLE BEARING

Gear Manufacturers Prepared For Part in Defense Program

■ NEARLY 100 members of the American Gear Manufacturers Association attended the organization's twenty-third semiannual meeting at Skytop Lodge, Skytop, Pa., Oct. 14, 15 and 16. In view of the critical international situation, even more emphasis than usual was placed on the strictly business features at this meeting, particularly those having a bearing on the national defense program.

U. Seth Eberhardt, president of the association, emphasized that the gear industry—possibly more than many others—is prepared to cope with whatever engineering and production load may be placed upon it as the defense program develops. Being to a large extent a "supplier to suppliers to the government," the gear industry has not yet felt the effects of defense buying and it may be three to six months before it does. Then, however, it is likely that the increase in business will be heavy.

Ready To Aid Defense

An interesting forecast along this line was made by W. L. Schneider of the Falk Corp., Milwaukee. Speaking on the current state of affairs, R. C. Ball of the Philadelphia Gear Works said that the gear industry just now is doing its part in "making more jobs for more people—but wondering where we are going." Interesting suggestions were made by Philip P. Gott of the United States chamber of commerce as to what he described the "microscopic and the telescopic functions of a trade association." Among other things, Mr. Gott urged that the experience of the Gear Manufacturers association be made available as soon as possible to those government agencies which are going to have gear procurement problems in connection with the defense program.

For example, they should be informed of the standards promulgated by the association, so that types and materials can be chosen best to suit particular needs. Army and navy authorities also should be fully acquainted with these standards so that needless delay and duplication of engineering effort will be avoided in drawing up specifications.

While the papers generally were of technical nature, there was one by E. S. Sawtelle of Tool Steel Gear & Pinion Co., Cincinnati, on "Credit Unions," which aroused lively interest and discussion. Started originally to keep workmen out of the hands of loan sharks, the credit union described by Mr. Sawtelle has had the effect not only of promoting thrift among the workmen, but also has given them much better understanding and appreciation of the American system of free enterprise. Mr. Sawtelle emphasized that in connection with an undertaking of this kind, company executives had best act only in an advisory capacity.

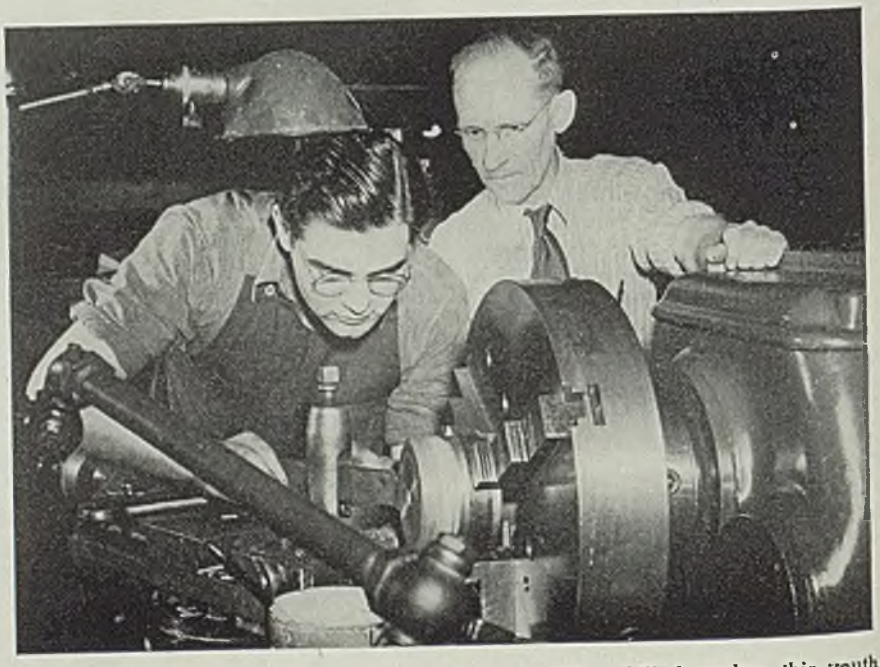
Technical papers included one by S. L. Crawshaw of Westinghouse Electric & Mfg. Co., on selection of bearings for gear drives. Mr. Crawshaw demonstrated that over a period of 20 years, improvements in bearings have exerted a marked influence not only in improving the mechanical performance of such things as gear reduction units, but also in making them more compact and in designing for better appearance. Better understanding of the fundamentals of bearing design—including plain or sleeve bearings—and of lubrication, have enabled bearings to be reduced in size without impairing efficiency.

Another subject dealt with was motion characteristics of silent chains. In this paper H. A. McAninch of the Link-Belt Co., traced the design history of the silent chain from its invention by Herbert Guthrie in England in 1893. He showed graphically how apparently minor changes in sprocket and link shapes have reduced the sound level and ironed out slight periodic variations in speed—at the same time eliminating vibratory action of the chain between its sprockets.

The metallurgical paper at this meeting was delivered by B. A. Miller of Cramp Brass & Iron Foundries Co. It dealt with metals which are believed to have application in worm gearing. Among those mentioned were tin-nickel-lead-copper alloy and silicon bronze. Composition, casting and heat treatment were covered, and physical properties—under the microscope and under test—were dealt with at some length.

Much time during the meeting was devoted to committee work, reports of progress being submitted on at least 12 projects. Among these projects were those of the technical standards committee which, under the chairmanship of T. R. Rideout of Westinghouse, has several important projects either completed or well on the way toward completion. Among those which have been carried through are two additional sections to recommended industrial gear lubrication practice—one on slush pan lubrication of open gears, the other on hand lubrication of open gears.

Trades Apprentice "Learns by Doing"



■ Receiving pointers on lathe operation from an older, skilled worker, this youth is one of 250 trades students enrolled at the East Pittsburgh, Pa., works of Westinghouse Electric & Mfg. Co. More than 500 young high school graduates are being enrolled in two and four-year training courses under an expanded trades education program conducted by Westinghouse to "provide skilled workers who will be needed in mass production of defense equipment. . . ."

Army, Navy Awards $124,650,286: $88,272,680 for Aircraft Engines

■ CONTRACTS announced by the army and navy departments for defense supplies last week aggregated $124,650,286.74. This was a substantial decline from recent weeks' totals, some of which exceeded half a billion. Most awards were comparatively small, largest being to Wright Aeronautical Corp., Paterson, N. J., for airplane engines and totaling $81,569,140.61. War department announced the following contracts:

Ordnance Department Awards

Ajax Electrothermic Corp., Trenton, N. J., electrical supplies, $1489.
Allen Co., H. F., Inc., New York, shapers, $10,228.
Aluminum Co. of America, Pittsburgh, ammunition components, $49,776.
American Brass Co., Waterbury, Conn., ammunition components, $112,592.
American Metal Co., Ltd. New York, chemicals, $43,350.
American Saw Mill Machinery Co., Hackettstown, N. J., assembling machines, $5500.
Armstrong Cork Co., Lancaster, Pa., ammunition components, $6,605.67.
Austin-Hastings Co. Inc., Cambridge, Mass., drill presses, $1,028.60.
Barker Tool, Die & Gauge Co., Detroit, gages, $2631.
Barwood & Co., Philadelphia, gages, $101,344.
Baush Machine Tool Co., Springfield, Mass., reaming machines, $9754.85.
Bethlehem Steel Co., Bethlehem, Pa., ammunition components, $6,922.50.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., artillery materiel, 396,250.
Blount Co., J. G., Everett, Mass., grinding machines, $6813.
Bridgeport Brass Co., Bridgeport, Conn., ammunition components, $364,965.
Bridgeport Thermostat Co. Inc., Bridgeport, Conn., small arms materiel, $1075.78.
Brown Instrument Co., Philadelphia, gages, $1,128.42.
Brown & Sharpe Mfg. Co., Providence, R. I., machines, $2,495.
Castelli, F. C., Co., Philadelphia, fire control equipment, $4,249.38.
Chicago Cork Works Co., Chicago, ammunition components, $2,589.85.
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling machines, $10,090.
Cleveland Automatic Machine Co., Cleveland, automatic lathes, $12,440.60.
Cleveland Container Co., Philadelphia, ammunition components, $1010.
Cleveland Tractor Co., Cleveland, tractors, $183,747.04.
Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., small arms materiel, $11,345.10.
Connecticut Tool & Engineering Co., Bridgeport, Conn., gages, $1506.
Continental Machines Inc., Minneapolis, machines, $1918.25.
Cuyahoga Spring Co., Cleveland, small arms materiel, $4535.19.
Dollin Corp., Irvington, N. J., ammunition components, $28,800.
Dover Boiler Works' Trustees, Dover, N. J., boiling tubs, $1645.
Duriron Co. Inc., Dayton, O., pumps, $1,177.20.
Eaton Mfg. Co., Detroit, small arms materiel, $2096.87.
Elliott Co., Jeannette, Pa., tools, $1161.
Engineering Tool Corp., Philadelphia, fire control equipment, $5,190.
Ericsson Screw Machine Products Co. Inc., Brooklyn, N. Y., ammunition components, $7150.
Federal Screw Works, Detroit, small arms materiel, $2136.42.
Finkl, A., & Sons Co., Chicago, artillery materiel, $94,250.
Fischer, Charles, Spring Co., Brooklyn, N. Y., small arms materiel, $101,880.30.
Fox Munitions Corp., Philadelphia, gages, $1,947.
General Box Co. Inc., Brooklyn, N. Y., ammunition components, $2179.40.
General Electric Co., Schenectady, N. Y., transformers, $2,981.85.
G. M. Mfg. Co. Inc., Long Island City, N. Y., ammunition components, $8,010.
Graton & Knight Co., Worcester, Mass., fire control equipment, $40,194.14.
Greenfield Tap & Die Corp., Greenfield, Mass., gages, $12,236.19.
Hadley Special Tool Co. Inc., Boston, small arms materiel, $3960.60.
Hall Co., Herbert, Newark, N. J., lathes $9150.
Hanniin Mfg. Co., Chicago, artillery materiel, $384,279.61.
Hanson-Whitney Machine Co., Hartford, Conn., gages, $5,636.72.
Harvey Metal Corp., Chicago, ammunition components, $245,030.
Heald Machine Co., Worcester, Mass., grinders, $15,713.
Holo-Krome Screw Corp., Hartford, Conn., small arms materiel, $1215.27.
Hydraulic Controls Inc., Chicago, and Wright Mfg. Co., Paterson, N. J., automotive equipment, $66,397.80.
Industrial Steels Inc., Chicago, small arms materiel, $2349.60.
International Harvester Co., Chicago, tractors, $33,562.76.
Kearney & Trecker Corp., Milwaukee, milling machines, $7707.80.
Kilgore Mfg. Co., International Flare Signal division, Tippecanoe City, O., ammunition components, $124,530.
Landis Machine Co., Waynesboro, Pa., pipe threading and cutting machines, $3111.26.
Lansdowne Steel & Iron Co., Morton, Pa., ammunition components, $176,640.
Leach Co., Oshkosh, Wis., automotive equipment, $5600.
Lees-Bradner Co., Cleveland, milling machines, $8364.50.
Lloyd & Arms Inc., Philadelphia, lathes, $4182.
Magnus Tool & Die Co., Newark, N. J., ammunition components, $10,800.
Maxon, W. L., Corp., New York, fire control equipment, $76,600.29.
Minneapolis-Honeywell Regulator Co., Minneapolis, fire control equipment, $480,425.
Morgan Machine Co., Rochester, N. Y., nailing machines, $9115.88.
Mueller Brass Co., Port Huron, Mich., ammunition components, $31,114.55.
Nash Engineering Co., South Norwalk, Conn., pumps, $1,385.
National Cash Register Co., Dayton, O., ammunition components, $224,000.
National Pneumatic Co. Inc., Rahway, N. J., artillery materiel, ammunition components, $555,380.
National Tube Co., Pittsburgh, ammunition components, $264,147.50.
New Haven Copper Co., Seymour, Conn., small arms materiel, $3680.30.
Niagara Blower Co., New York, pumps and motors, $1,670.
Niles-Bement-Pond Co., Pratt & Whitney division, Hartford, Conn., reaming machines, gages, $30,911.77.
Nodern Tool & Die Co., Philadelphia, gages, $11,310.
Oliver Instrument Co., Adrian, Mich., grinding machines, $2805.
Oliver Iron and Steel Corp., Pittsburgh, ammunition components, $58,991.63.
Pipe Machinery Co., Cleveland, gages, $4061.94.
Plastic & Die Cast Products Corp., Los Angeles, ammunition components, $1,632.80.
Pratt Industries Inc., Frankfort, N. Y., ammunition components, $236,241.75.
Precise Tool & Mfg. Co., Farmington, Mich., gages, $60,230.90.
Production Tools & Die Co. Inc., Springfield, Mass., machines, $2800.
Ransome Concrete Machine Co., Dunellen, N. J., artillery materiel, $146,893.50.
Republic Steel Corp., Massillon, O., small arms materiel, $68,856.63.
Schmidt, George T., Inc., Chicago, marking machines, $1445.
Scovill Mfg. Co., Waterbury, Conn., small arms ammunition components, $93,759.
Sheffield Gage Corp., Dayton, O., gages, $8811.09.
Shipley, W. E., Machinery Co., Philadelphia, lathes, $1,387.
Stevens Walden Inc., Worcester, Mass., small arms materiel, $10,572.
Struthers Wells-Titusville Corp., Titusville, Pa., artillery materiel, $127,000.
Towmotor Co., Cleveland, tractors, $1,343.
Tredegar Co., Tredegar Iron Works, Richmond, Va., ammunition components, $42,224.
Tyne Co., Pittsburgh, towing cable, $1,226.10.
Union Parts Mfg. Co. Inc., Brooklyn, N. Y., ammunition components, $5,490.
Universal Boring Machine Co., Hudson, Mass., boring, drilling, milling machines, $40,752.
Vinco Corp., Detroit, gages, $48,345.50.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., assembling machines, stamping identification machines, $23,675.
Watson-Stillman Co., Roselle, N. J., pumps, $5,325.
Weaver Mfg. Co., Springfield, Ill., trucks, $29,565.
Western Austin Co., Aurora, Ill., artillery materiel, $240,280.
Whitlock Mfg. Co., Hartford, Conn., water heaters, $1115.
Wiedemann Machine Co., Philadelphia, gages, $8,845.
Wilson Mechanical Instrument Co. Inc., New York, testers, $1,712.30.

Quartermaster Corps Awards

Aluminum Products Co., La Grange, Ill., component parts for field ranges, $149,742.
Atlas Bolt & Screw Co., Cleveland, repair parts for cots, $118.80.
Banner Bed Co., Chicago, steel folding cots, $66,000.
Barcalo Mfg. Co., Buffalo, repair parts for cots, $13,505.
Craft Mfg. Co., Chicago, repair parts for cots, $190.99.
Englander Co. Inc., Brooklyn, N. Y., steel folding cots, $58,800.
Evansville Metal Bed Co., Evansville, Ind., steel folding cots $34,400.
Hard Mfg. Co., Buffalo, steel folding cots, $76,820.
Harris Hub Bed & Spring Co., Cicero, Ill., steel folding cots, $329,600.
International Silver Co., Meriden, Conn., parts for mess outfits, $148,400.
Logan Co., Louisville, Ky., steel folding cots, $268,200.
Mapel, John T., Miami Beach, Fla., electric distribution and street lighting system, MacDill field, Tampa, Fla., $72,925.
McMath Construction Co., Columbus, Ga., construction of asphalt road, Ft. Benning, Georgia, $74,997.50.
Moto-Scoot Mfg. Co., Chicago, steel folding cots, $40,120.
Reliance Plumbing Co., Chicago, construction, completion of water lines, Scott field, Illinois, $29,000.
Scully, Angelo, Chicago, water, sanitary sewer lines, Ft. Sheridan, Illinois, $11,988.36.
Shannon Spring & Bed Co., Louisville, Ky., steel folding cots, $49,350.
Simmons Co., New York, steel folding cots, repair parts for cots, $334,562.50.

Spring Products Corp., Long Island City, N. Y., steel folding cots, repair parts for cots, $67,222.69.
Superior Sleeprite Corp., Chicago, steel folding cots, $362,500.
Townsend Co., New Brighton, Conn., repair parts for cots, $164.75.
Wallace, R., & Sons Mfg. Co., Wallingford, Conn., parts for mess outfits, $42,000.
West End & Hub Spring Co. Inc., Boston, repair parts for cots, $3969.55.
Yellow Truck & Coach Mfg. Co., Pontiac, Mich., trucks, $104,952.61.

Chemical Warfare Service Awards

Benson Co., L. A., Inc., Baltimore, milling machines, $4996.
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling machines, $12,672.37.
Cone Automatic Machine Co. Inc., Windsor, Vt., screw machines, $20,065.
General Fireproofing Co., Youngstown, O., steel shelving, $2072.28.
Gisholt Machine Co., Madison, Wis., lathes, $21,248.
Gould & Eberhardt, Newark, N. J., shapers, $8065.
Graver Tank & Mfg. Co. Inc., East Chicago, Ind., tanks, $14,878.
Gries Reproducer Corp., New York, indicators, $2388.80.
Kearney & Trecker Corp., Milwaukee, milling machines, $16,763.35.
Lodge & Shipley Machine Tool Co., Cincinnati, lathes, $8114.
Meriam Co., Cleveland, meters, indicators, $1648.18.
Monarch Machine Tool Co., Sidney, O., lathes, $41,606.
Stokes, F. J., Machine Co., Philadelphia, industrial dryers, $10,920.
Swind Machinery Co., Philadelphia, milling machines, shapers, $8498.
Warner & Swasey Co., Cleveland, lathes, $8332.

Signal Corps Awards

Philco Corp., Philadelphia, radio receivers $671,000.
RCA Mfg. Co., Camden, N. J., radio receivers, $7,605,773.06.

Medical Department Awards

General Electric Supply Co., Schenectady, N. Y., refrigerators, $8931.
Lansing Co. of Delaware, New York, trailer trucks, $13,936.
Penn Surgical Mfg. Co. Inc., Philadelphia, surgical instruments, $6199.
Service Industries Inc., Chicago, food carts, $17,625.
Soo Bed Table Co., Sioux Falls, S. D., overbed tables, $5100.
Wilmot Castle Co., Rochester, N. Y., sterilizers, $6480.

Corps of Engineers Awards

Barco Mfg. Co., Chicago, hammers, $17,154.
Buda Co., Harvey, Ill., boring machines, $117,427.
Century Boat Co., Manistee, Mich., boats, $98,800.
Columbian Steel Tank Co., Kansas City, Mo., steel buildings, $37,279.75.
Fairchild Aviation Corp., Jamaica, N. Y., stereoscopes, $254,152.
Gallon Iron Works & Mfg. Co., Gallon, O., graders, $135,626.
Gurley, W. & L. E., Troy, N. Y., transits, $331,625.
Heil Co., Milwaukee, wagon scrapers, $30,450.
Hoe, R., & Co. Inc., New York, rotary offset presses, $29,250.
Igoe Bros. Inc., Brooklyn, N. Y., nails, $38,977.69.
Jahn Co., Chicago, trailers, $134,500.
Keuffell & Esser Co., Hoboken, N. J., transits, $51,200.
Muth, George F., Co. Inc., Washington, drawing instruments, $43,868.
Paving Supply & Equipment Co., Washington, shovels, $20,581.
Ransome Concrete Machinery Co., Dunellen, N. J., concrete mixers, $33,722.50.

(*Please turn to Page* 33)

Purchases Under Walsh-Healey Act

(In Week Ended Oct. 5)

Iron and Steel Products	Commodity	Amount
Ajax Steel & Forge Co., Detroit	Forgings	$18,870.00
Alemite Co. of Maryland, Baltimore	Pressure gun fittings	24,104.30
American Chain & Cable Co. Inc., American Chain division, York, Pa.	Plate, chain assemblies	16,519.70
American Steel & Wire Co., Chicago	Wire rope	16,162.00
Babcock & Wilcox Co., Barberton, O.	Tube supports	11,043.60
Bethlehem Steel Co., Cincinnati	Structural steel	54,990.00
Butler Mfg. Co., Kansas City, Mo.	Grain bins	*831,750.00
Chicago Bridge & Iron Co., Philadelphia	Steel tank	12,940.00
Colorado Fuel & Iron Corp., Denver	Tie plates, spikes	30,745.44
Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.	Pistol parts	20,805.00
Columbian Steel Tank Co., Kansas City, Mo.	Grain bins	*435,097.00
Crane Co., Chicago	Valves	27,932.00
Crucible Steel Co. of America, New York	Steel	58,924.77
Daniel Russell Boiler Works, Boston	Float buoys	31,284.00
General Electric Co., Schenectady, N. Y.	Howitzers	1,759,826.00
Gillette Safety Razor Co., Boston	Safety razors	92,940.00
Hyman-Michaels Co., Chicago	Relay rails	61,722.15
Lindberg Engineering Co., Chicago	Furnaces	13,774.00
Manning, Maxwell & Moore Inc., Bridgeport, Conn.	Valves	46,378.62
Mine Safety Appliance Co., Pittsburgh	Portable tools	592,715.49
National Pneumatic Co. Inc., Rahway, N. J.	Guns	5,904,526.43
Naylor Pipe Co., Chicago	Steel pipe	*17,359.79
Pacific Car & Foundry Co., Seattle	Steel frame	137,600.00
Republic Steel Corp., Massillon, O.	Steel	61,081.50
Sieg Co., Davenport, Iowa	Jacks	12,180.60
Summerill Tubing Co., Bridgeport, Pa.	Steel tubing	13,364.40
Tucker Co. Inc., New York	Motor maintenance equipment	20,193.39
United States Steel Export Co., New York	Steel plates	145,780.00
Walter Kidde & Co. Inc., New York	Valve assembly	20,342.40
Walworth Co., New York	Pipe flanges	19,433.25
Weaver Mfg. Co., Springfield, Ill.	Motor maintenance equipment	104,196.43
Williams, F. C., Inc., Dearborn, Mich.	Heating units	26,073.00
Wire Rope Corp. of America Inc., New Haven, Conn.	Hawsers	18,275.00
York Safe & Lock Co., York, Pa.	Guns	2,914,724.00

*Estimated.

Nonferrous Metals and Alloys		
American Brass Co., Waterbury, Conn.	Copper nickel tubing	$42,998.75
	Condenser tubes	158,391.41
Bridgeport Brass Co., Bridgeport, Conn.	Aluminum litters	22,900.00
Depuy Mfg. Co., Warsaw, Ind.		
General Time Instruments Corp., Westclox division, LaSalle, Ill.	Fuse parts	35,898.00
National Lead Co., Baltimore	Pig lead	11,580.00
Revere Copper & Brass Inc., Baltimore	Seamless bands	34,774.84

Machinery and Other Equipment		
Aldrich Pump Co., Allentown, Pa.	Pumps	$11,852.00
Allis-Chalmers Mfg. Co., Milwaukee	Tractors	37,728.00
Axelson Mfg. Co., Los Angeles	Engine lathes	10,865.20
Bullard Co., Bridgeport, Conn.	Boring mills	134,600.34
Caterpillar Tractor Co., Peoria, Ill.	Tractors, motor graders	221,000.12
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati	Milling machines	50,226.37
Cleveland Tractor Co., Cleveland	Tractors	39,673.20
Clyde Iron Works Inc., Duluth	Winches	73,890.00
Consolidated Machine Tool Corp., Rochester, N. Y.	Engine lathes	42,950.00
Cory & Joslin Inc., San Francisco	Pumping plant	379,000.00
Foster Wheeler Corp., Richmond, Va.	Condensing equipment	207,000.00
General Elevator Co., Inc., Baltimore	Elevator	18,595.00
Gisholt Machine Co., Madison, Wis.	Lathes	21,248.00
Hardinge Brothers Inc., Elmira, N. Y.	Lathes	13,578.00
Imperial Machine & Foundry Corp., Lindenhurst, Long Island	Vegetable machines	13,276.00
Kearney & Trecker Corp., Milwaukee, Wis.	Milling machines	33,450.10
Link-Belt Speeder Corp., Chicago	Crane	19,378.00
Logansport Machine Inc., Logansport, Ind.	Shaving machines	44,700.00
McCray Refrigerator Co., Kendallville, Ind.	Refrigerators	373,207.50
Monarch Machine Tool Co., Sidney, O.	Lathes	41,606.00
National Twist Drill & Tool Co., Detroit	Twist drills	12,525.72
Noland Co., Washington	Sanders, valve refacers	10,699.81
Prentiss, Henry, & Co., New York	Machines	51,924.00
Sanitary Refrigerator Co., Fond du Lac, Wis.	Refrigerators	108,620.00
Sellers, Wm., & Co. Inc., Philadelphia	Boring machines, planers	100,947.00
Service Industries Inc., Chicago	Food cart	17,625.00
Smith, H. A., Machinery Co., Syracuse, N. Y.	Milling machines	50,696.00
Stedfast & Roulston Inc., Boston	Milling machines	59,909.17
Swind Machinery Co., Philadelphia	Machines	33,882.00
Tidewater Supply Co. Inc., Norfolk, Va.	Boring machines	19,806.00
Weber & Co., San Francisco	Crane	14,578.00
Worthington Pump & Machinery Corp., Harrison, N. J.	Pumps	47,991.00
Yale & Towne Mfg. Co., Stamford, Conn.	Pumps	91,233.68

Army, Navy Awards

(*Concluded from Page 32*)

Rogers Bros. Corp., Albion, Pa., trailers, $24,372.
Snead & Co., Jersey City, N. J., ponton sets, $1,063,050.
Winter Weiss Co., Denver, trailers, $286,-200.
Wallace & Tiernan, Belleville, N. J., water purification unit and spare parts, $39,235.

Airplane Engine Awards

War department announced last week contracts totaling $81,569,140.-61 for airplane engines had been cleared by the national defense advisory commission, and awarded to Wright Aeronautical Corp., Paterson, N. J.

Part of this order was allocated to the navy, under the policy announced by the war department Aug. 30, 1940, whereby the army will deal exclusively with Wright Aeronautical Corp. for Wright engines for combined army and navy requirements.

Such engines as will go to the Navy will be paid for by transfer of navy funds to the army.

Aviation Mfg. Co., Lycoming division, Williamsport, Pa., was awarded a contract of $6,703,539.75 for airplane engines.

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Navy department announced following yards and docks awards:

Dally Construction & Engineering Co. and C. F. Dally, Seattle, three ammunition industrial buildings, Naval Torpedo station, Keyport, Wash., $166,949.
Early Jr., Fred J., Co., San Francisco, remodeling barracks building and two quarters, naval net depot, Tiberon, Calif., $22,915.
Glazer, Samuel, Everett, Mass., miscellaneous repairs and improvements, naval direction finder station, Fourth Cliff, Mass., $1195.
Jeffress-Dyers Inc., Washington, additional facilities at naval proving ground, Dahlgren, Va., on a cost plus fixed fee basis; estimated at $372,000.

Bureau of Supplies and Accounts Awards

Ajax Electric Co. Inc., Philadelphia, electric furnaces, $21,900.
American Engineering Co., Philadelphia, anchor and capstan windlass, $517,200.
American Tool Works Co., Cincinnati, lathes, $154,538.
Anaconda Wire & Cable Co., New York, insulated copper wire, $850,596.
Batteryless Telephone Equipment Co. Inc., Pittsburgh, diving telephones, $34,950.
Bay City Shovels Inc., Bay City, Mich., traveling crane, $5,200.
Bendix Aviation Corp., Bendix, N. J., drift sights, climb indicators, $452,619.50.
Bethlehem Steel Co., Bethlehem, Pa., alloy steel forgings, $506,250.
Breeze Corps. Inc., Newark, N. J., aircraft flowmeters, $355,805.
Brown & Sharpe Mfg. Co., Providence, R. I., milling, automatic screw machines, $133,357.01.
Bucyrus-Erie Co., South Milwaukee, Wis., steam locomotive crane, $75,970.
Carnegie-Illinois Steel Corp., Pittsburgh, sheet steel piling, steel I-beams, steel forgings, steel, $6,057,068.09.
Chicago Pneumatic Tool Co., Philadelphia, pneumatic drills, $10,143.60.
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling machines, $70,712.
Collyer Insulated Wire Co., Pawtucket, R. I., insulated copper wire, power cable, copper wire, $687,298.90.
Columbia Steel Co., San Francisco, wire nails, $6202.
Crane Co., Chicago, lift check valves. $6720.
Crescent Insulated Wire and Cable Co., Trenton, N. J., copper wire, $55,465.
Curtiss-Wright Corp., St. Louis Airplane division, Robertson, Mo., airplanes, $3,674,566.39.
DeWalt Products Corp., Lancaster, Pa., woodworking machines, $12,510.
Edison, Thomas A., Inc., West Orange, N. J., engine gage units, $159,792.48.
Electric Products Co., Cleveland, welding sets and control panels, $76,496.
Electric Storage Battery Co., Philadelphia, submarine main storage battery elements, $7,630.
General Cable Corp., New York, submarine cable, insulated copper wire, $392,940.
General Electric Co., Schenectady, N. Y., blading material, welding sets, copper wire, $160,865.50.
Gleason Works, Rochester, N. Y., gear cutting, planer machine, $45,547.
Grace Line Inc., Washington, unbroached stores, $5142.01.
Hayes Mfg. Corp., Grand Rapids, Mich., steel shell blanks, $46.610.
Jones & Laughlin Steel Corp., Pittsburgh, steel I-beams, $35,700.
Keystone Steel & Wire Co., Peoria, Ill., nails, $16,995.
Laganke Electric Co., Cleveland, ammeters, $5061.
Landis Tool Co., Waynesboro, Pa., universal grinder machines, $5472.
LeBlond, R. K., Machine Tool Co., Cincinnati, engine lathes, $105,759.
Lodge & Shipley Machine Tool Co., Cincinnati, engine lathes, $77,136.
Lucas Machine Tool Co., Cleveland, horizontal boring, milling and drilling machine, $9540
Lukens Steel Co., Coatesville, Pa., steel, $889,024.85.
Mattison Machine Works, Rockford, Ill., surface grinder, $8683.
McKiernan-Terry Corp., Harrison, N. J., boat crane machinery, $56,570.
Midvale Co., Philadelphia, steel forgings, $616,153.
Monarch Machine Tool Co., Sidney, O., lathes, $21,379.
National Electrical Machine Shops Inc., Washington, bearing circles, $9890.
National Electric Products Corp., Pittsburgh, copper wire, $80,710.
National Engineering Co., Chicago, sand mixing machine, $14,701.
National Malleable & Steel Castings Co., Cleveland, cast steel chain, $26,880.
Okonite Co., Passaic, N. J., cable, $16,044.
Okonite-Callender Cable Co., Paterson, N. J., cable, $59,850.
Oneida Ltd., Oneida, N. Y., tableware, $25,712.50.
Phelps Dodge Copper Products Corp., New York, copper-nickel alloy tubing, copper wire, $124,377.76.
Prentiss, Henry, & Co. Inc., New York, boring and turning machine, $28,841.
Pressed Steel Tank Co., West Allis, Wis., blank shells, $47,470.
Reed & Barton Corp., Taunton, Mass., tableware, $51,502.
Ritchie, E. S., & Sons Inc., Brookline, Mass., compasses, $8891.40.
Rockford Machine Tool Co., Rockford, Ill., hydraulic planer, $22,250.
Rome Cable Corp., Rome, N. Y., copper wire, $43,730.
Service Caster & Truck Co. of New England, Somerville, Mass., stacking, tierling machines, $9098.15.
Shipley, W. E., Machinery Co., Philadelphia, horizontal boring, milling, and drilling machines, $53,565.
Simmons Co., New York, steel bedsteads, steel mess tables, $97,521.22.
Square D. Co., Elmhurst, N. Y., drift sights, climb indicators, $852,196.
Stedfast & Roulston Inc., Boston, boring mill, $31,706.40.
Trailer Co. of America, Berkeley, Calif., semi-trailers, $6405.60.
Union Insulating Co., Parkersburg, W. Va., incandescent lamp sockets, tips, plugs, $15,568.
United States Gauge Co., New York, airspeed indicators, $42,600.
Utica Cutlery Co., Utica, N. Y., tableware, $25,025.
Vandyck-Churchill Co., Philadelphia, boring mill machines, $81,983.50.
Waukesha Motor Co., Waukesha, Wis., aircraft engine, $23,653.60.
Western Laundry Machinery Co., North Kansas City, Mo., laundry equipment, $12,003.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., welding sets, $8980.
Worth Steel Co., Claymont, Del., steel, $1,343,095.52.
Youngstown Sheet & Tube Co., Youngstown, O., nickel steel, $27,496.

Careful Buying Will Aid Defense Plan, Says Editor

■ Well planned purchasing by steel consumers, geared to the tempo of defense requirements, can be most effective implement in preparing the nation for any eventuality, William M. Rooney, managing editor, *Daily Metal Trade*, Cleveland, told the Purchasing Agents Association of Erie, Pa., Oct. 16.

"If the buyer of steel will anticipate his requirements carefully on the basis of the situation resulting from the defense program, he will assist materially in the efficient functioning of the industry. This imposes upon the purchaser the necessity for greater planning and more careful evaluation of facts and forces.

"Unquestionably inventories should be enlarged beyond what ordinarily would be considered normal levels . . . By ordering reasonably ahead the manufacturer can be acquainted with prospective demands sufficiently in advance of actual need, enabling him to arrange an orderly and sensible production program."

Mr. Rooney reassured the buyers that this country faces no danger of a "bottleneck" in steel production; capacity is adequate for normal needs, an inflated export demand and for the defense program. The danger lies, he said, in temporary bulges, which can be avoided by careful planning and co-operation between buyer and producer.

Molding, Patternmaking Contest for Apprentices

■ Apprentice training committee, American Foundrymen's association, will continue to sponsor competitions in molding and patternmaking in 1941. Contests will be held in four classes, gray iron molding, steel molding, nonferrous molding and patternmaking, and prizes of $30, $20 and $10 offered in each class.

Any regularly indentured apprentice is eligible to compete. Copy of rules may be obtained from the committee secretary, 222 West Adams street, Chicago.

"Labor" and the Defense Program

■ AT RAVENNA, O., the Hunkin-Conkey Co., Cleveland, is preparing to build a huge shell-loading plant for the government. This contractor has a closed-shop agreement with AFL unions. All applicants for work are referred to union business agents and must pay initiation fees and union dues before they can go on the payroll.

This arrangement, of course, is ideal for the professional labor organizer. It arms him with an economic blackjack which he can use with unfailing effect to enroll dues-paying union members. The sky is the limit and, under the national labor relations law, and with the blessing of the national labor relations board and the present administration, he can go as far as his conscience will let him.

* * *

How labor organizers think is strikingly reflected by the editorializing and propaganda that characterize so many of the "news dispatches" that appear in the newspapers that are published for circulation among present and potential dues-paying union members. An example of this type of "news reporting" is to be found in the following lead paragraph of a story which appeared in a recent issue of *The Alabama News Digest,* published at Birmingham, Ala.:

"WASHINGTON — It would probably make antilabor officials of Republic Steel Corp. and Goodyear Tire & Rubber Co. very angry and might destroy the political life of Gadsden's city commissioner, Herbert S. Meighan, if he would accede to the suggestion that he call a labor peace conference of all factions in Gadsden, but it would result in Gadsden getting the big U. S. shell loading plant now being held up by the national defense commission because of Gadsden's antilabor record."

* * *

Insistence on this line of reasoning forced from Attorney General Jackson the informal opinion which labor leaders interpreted as meaning that no manufacturer could receive a government contract while in violation of a national labor relations board order even though it had been appealed to a court.

The secretaries of war and of the navy (STEEL, Oct. 14, p. 82) declared they would not feel impelled, under this ruling, to deny defense contracts to companies held by the labor board to be in violation of the labor relations act. Later, Mr. Knudsen of the defense commission concurred in this attitude.

* * *

On the other hand, labor leaders believe that they have assurances from Sidney Hillman that future government orders will be placed only after due consideration has been given to the labor records of companies and communities involved.

If labor leaders persist in fighting for policies the effect of which would be to delay the defense program a showdown cannot be avoided. It is unthinkable that the American people as a whole long would tolerate exploitation of the defense effort in the interest of the professional labor group.

E C Kreutzberg

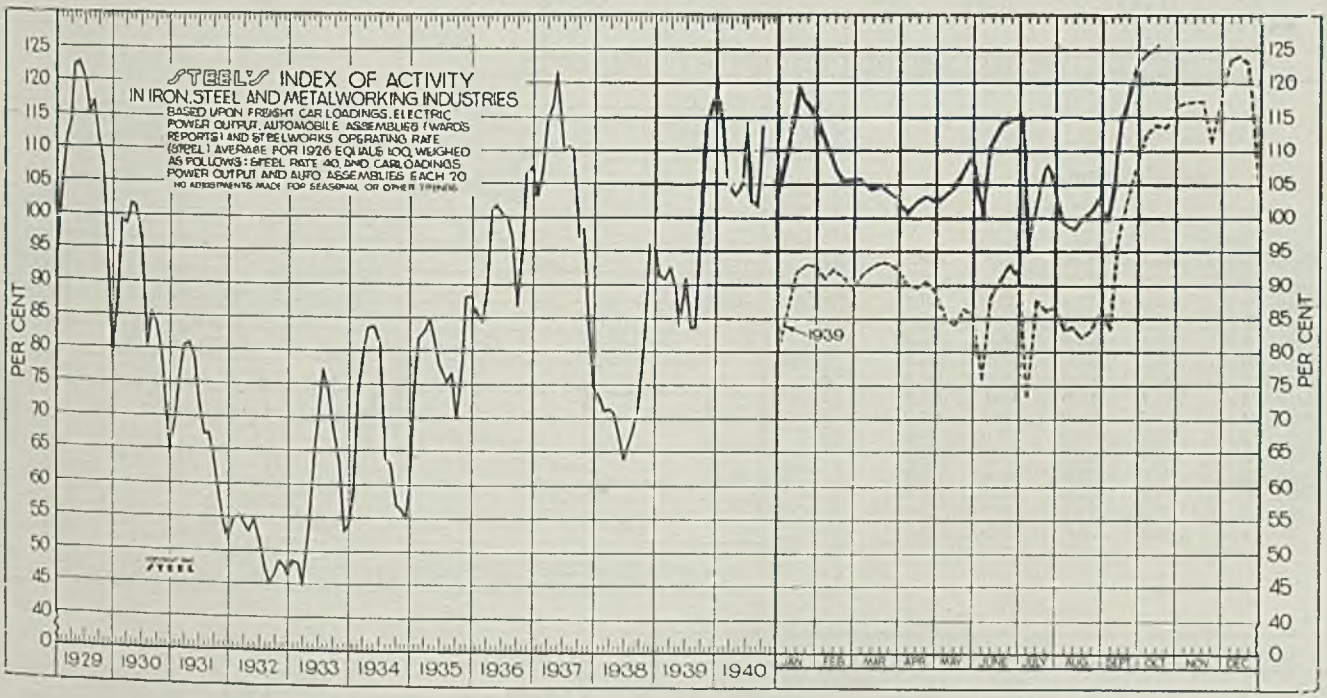
The *BUSINESS TREND*

Activity Index Reaches New High Level

■ ORDER backlogs in most industrial lines are expanding, reflecting large government expenditures for the defense program and continued increase in export trade. This is particularly encouraging in view of the near capacity operations maintained in many industrial lines. Based on the heavy volume of incoming business and the backlog of unfilled orders, particularly in the heavy industries, prospects are for a steady improvement in industrial output through the remainder of this year at least.

The sharp expansion in industrial activity in recent months together with the prospects of further gains in the immediate future have prompted purchasing agents to build up inventories as a precautionary move. Possibility of government priorities placed on certain items is another factor influencing this trend. However, the larger inventories on hand in most instances are not out of line with the substantial higher level of industrial operations and prospects for further gains in the near future.

STEEL's index of activity in the week ended Oct. 12 gained 1.6 points to 126.0, to exceed the previous peak of 125.3 recorded during the week of April 27, 1929. All four of the industrial indicators composing the index recorded moderate improvement during the latest period.



STEEL'S index of activity gained 1.6 points to 126.0 in the week ended Oct. 12:

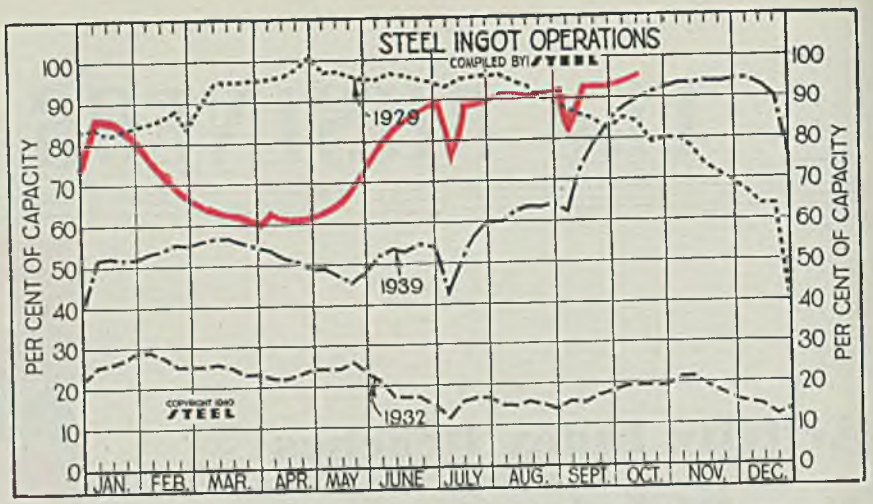
Week Ended	1940	1939
Aug. 3	96.7	83.5
Aug. 10	98.5	83.9
Aug. 17	100.8	82.2
Aug. 24	101.4	83.4
Aug. 31	103.5	86.3
Sept. 7	98.7	83.7
Sept. 14	114.9	97.5
Sept. 21	117.7	103.0
Sept. 28	122.8	107.9
Oct. 5	124.4	112.5
Oct. 12	126.0	113.9

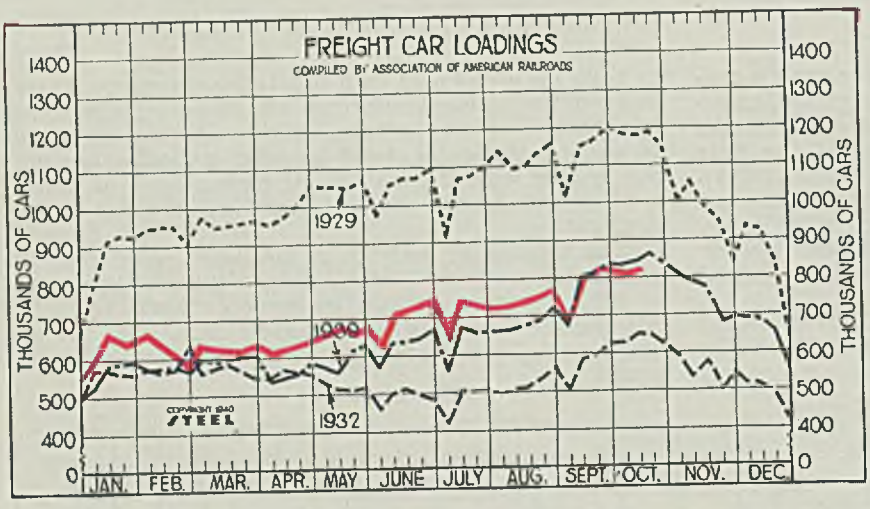
Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	103.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	101.1	83.9	68.7	110.0	97.1	76.7	53.0	74.1	45.0	67.4	85.4	116.9
Sept.	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	...	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	...	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec	...	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

Steel Ingot Operations

(Per Cent)

Week ended	1940	1939	1938	1937
July 13....	88.0	50.5	32.0	82.0
July 20....	88.0	56.5	36.0	81.0
July 27....	89.5	60.0	37.0	84.0
Aug. 3....	90.5	60.0	40.0	84.5
Aug. 10....	90.5	62.0	40.0	84.0
Aug. 17....	90.0	63.5	41.5	81.0
Aug. 24....	90.5	63.5	43.5	83.0
Aug. 31....	91.5	64.0	44.5	83.0
Sept. 7....	82.0	62.0	41.5	72.0
Sept. 14....	93.0	74.0	46.0	80.0
Sept. 21....	93.0	79.5	48.0	76.0
Sept. 28....	93.0	84.0	47.0	74.0
Oct. 5....	93.5	87.5	48.5	66.0
Oct. 12....	94.5	89.5	51.5	63.0





Freight Car Loadings

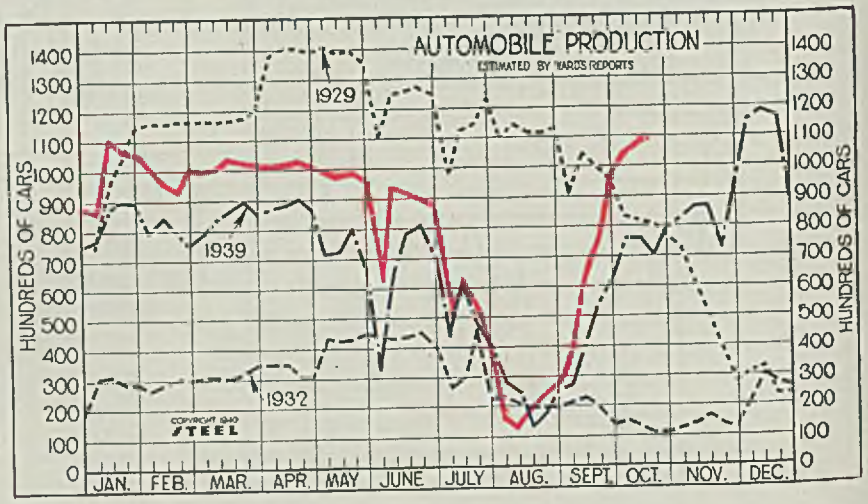
(1000 Cars)

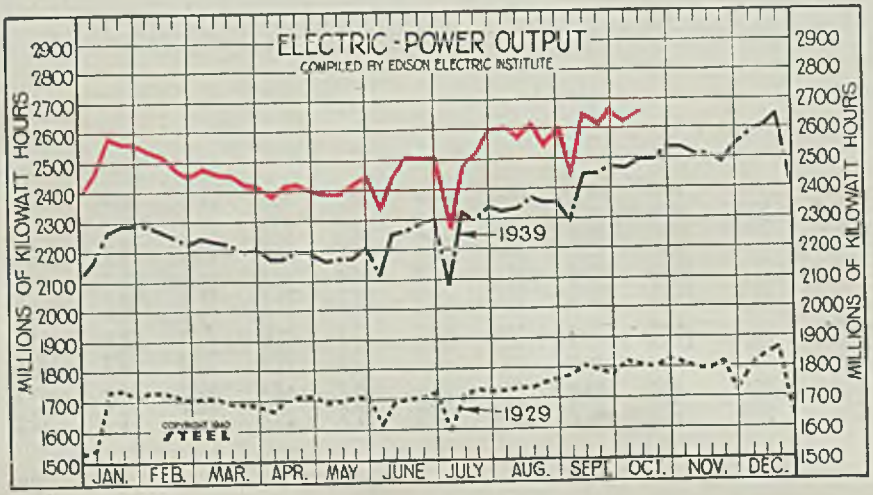
Week ended	1940	1939	1938	1937
July 13.....	740	674	602	770
July 20.....	730	656	581	771
July 27.....	718	660	589	783
Aug. 3.....	718	661	584	770
Aug. 10.....	727	665	590	777
Aug. 17.....	743	674	598	781
Aug. 24.....	761	688	621	787
Aug. 31.....	769	722	648	805
Sept. 7.....	695	667	569	711
Sept. 14.....	804	806	660	827
Sept. 21.....	813	815	676	840
Sept. 28.....	822	835	698	847
Oct. 5.....	806	835	703	815
Oct. 12.....	812	845	727	810

Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
July 13....	62.2	61.6	42.0	115.4
July 20....	53.0	47.4	32.1	88.1
July 27....	34.8	40.6	30.4	86.4
Aug. 3....	17.4	28.3	14.8	78.7
Aug. 10....	12.6	24.9	13.8	103.3
Aug. 17....	20.5	13.0	23.9	93.3
Aug. 24....	23.7	17.5	18.7	83.3
Aug. 31....	27.6	25.2	22.2	64.2
Sept. 7....	39.7	26.9	17.5	59.0
Sept. 14	66.6	41.2	16.1	30.1
Sept. 21....	78.8	53.9	20.4	28.0
Sept. 28....	95.9	62.8	25.4	45.8
Oct. 5....	105.2	76.1	37.7	72.0
Oct. 12....	108.0	75.9	50.5	89.7

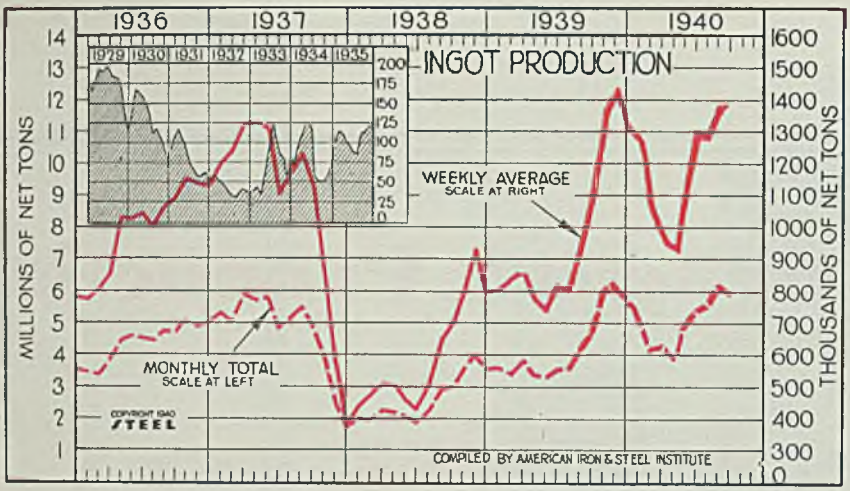




Electric Power Output

(Million KWH)

Week ended	1940	1939	1938	1937
July 13...	2,483	2,324	2,084	2,298
July 20...	2,524	2,295	2,085	2,259
July 27...	2,601	2,342	2,094	2,256
Aug. 3...	2,605	2,325	2,116	2,262
Aug. 10...	2,589	2,333	2,134	2,301
Aug. 17...	2,606	2,368	2,139	2,304
Aug. 24...	2,571	2,354	2,134	2,295
Aug. 31...	2,601	2,357	2,149	2,321
Sept. 7...	2,463	2,290	2,048	2,154
Sept. 14...	2,639	2,444	2,215	2,281
Sept. 21...	2,629	2,449	2,154	2,266
Sept. 28...	2,670	2,470	2,139	2,275
Oct. 5...	2,641	2,465	2,154	2,280
Oct. 12...	2,665	2,495	2,183	2,276



Steel Ingot Production

(Unit 100 Net Tons)

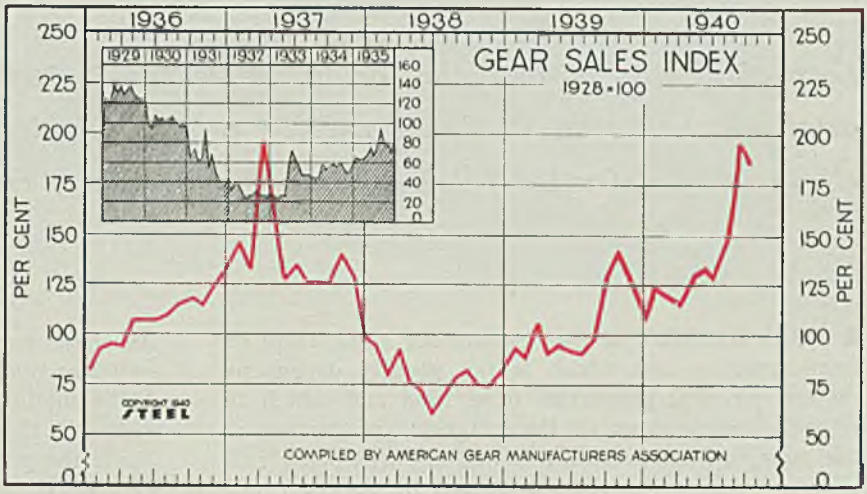
	Monthly Total		Weekly Average	
	1940	1939	1940	1939
Jan.	5,655.3	3,578.9	1,276.6	807.9
Feb.	4,409.0	3,368.9	1,065.0	842.2
Mar.	4,264.8	3,839.1	962.7	866.6
Apr.	3,974.7	3,352.8	926.5	781.5
May	4,841.4	3,295.2	1,092.9	743.8
June	5,532.9	3,523.9	1,289.7	821.4
July	5,595.1	3,564.8	1,265.9	806.5
Aug.	6,033.0	4,242.0	1,361.9	957.6
Sept.	5,895.2	4,769.5	1,377.4	1,114.4
Oct.	.....	6,080.2	.....	1,372.5
Nov.	.....	6,147.8	.....	1,433.0
Dec.	.....	5,822.0	.....	1,317.2
Total	.....	51,585.0	.....	989.4†

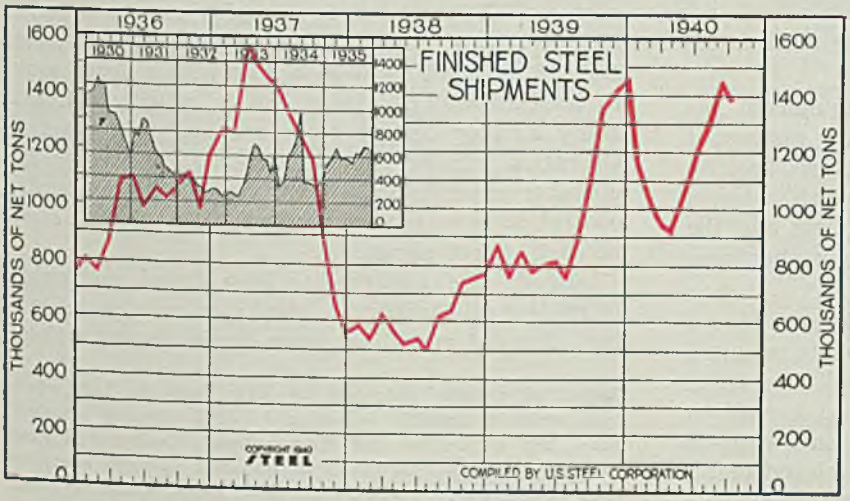
†Weekly average.

Gear Sales Index

(1928 = 100)

	1940	1939	1938	1937	1936
Jan.	123	91.0	93.0	144.0	90.5
Feb.	116	86.0	77.0	130.5	93.0
Mar.	114	104.0	91.0	195.0	92.0
April	128	88.0	74.0	164.0	105.0
May	133	93.0	70.0	125.5	105.0
June	129	90.0	58.0	134.0	105.0
July	141	89.0	67.0	124.0	107.5
Aug.	191	96.0	76.5	125.0	113.0
Sept.	183	126.0	80.5	123.0	115.5
Oct.	.....	141.0	72.5	139.5	112.5
Nov.	.....	126.0	72.0	127.5	122.5
Dec.	.....	111.0	81.0	97.0	132.5
Ave.	.....	103.5	76.0	135.5	107.5





Finished Steel Shipments

U. S. Steel Corp.

(Unit 1000 Net Tons)

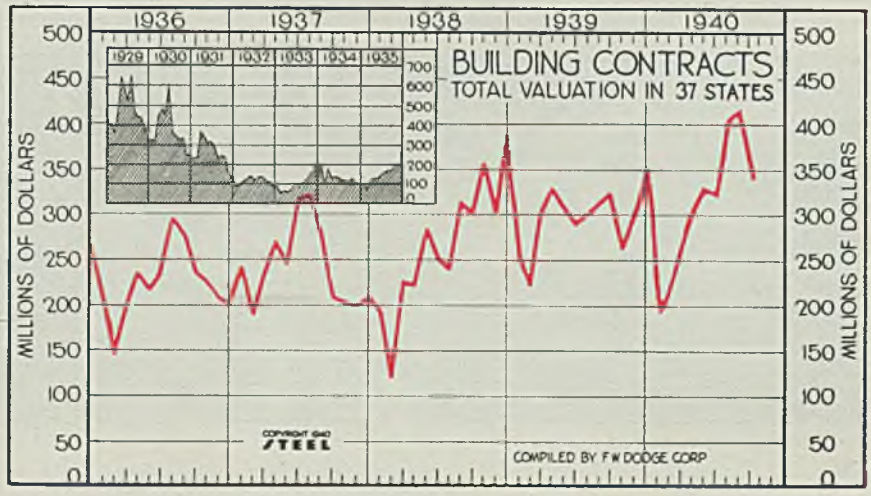
	1940	1939	1938	1937	1936
Jan.	1145.6	870.9	570.3	1268.4	795.2
Feb.	1009.3	747.4	522.4	1252.8	747.4
Mar.	931.9	845.1	627.0	1563.1	863.9
Apr.	907.9	771.8	550.5	1485.2	1080.7
May	1084.1	795.7	509.8	1443.5	1087.4
June	1209.7	807.6	525.0	1405.1	978.0
July	1296.9	745.4	484.6	1315.3	1050.1
Aug.	1455.6	885.6	615.5	1225.9	1019.9
Sept.	1392.8	1086.7	635.6	1161.1	1060.7
Oct.	.....	1345.9	730.3	876.0	1109.0
Nov.	.....	1406.2	749.3	648.7	947.3
Dec.	.....	1444.0	765.9	539.5	1178.6
Total†	...	11707.3	7315.5	14097.7	11905.0

†After year-end adjustments.

Construction Total Valuation In 37 States

(Unit: $1,000,000)

	1940	1939	1938	1937	1936
Jan.	$196.2	$251.7	$192.2	$242.7	$204.8
Feb.	200.6	220.2	118.9	188.3	142.1
Mar.	272.2	300.7	226.6	231.2	199.0
April	300.5	330.0	222.0	269.5	234.8
May	328.9	308.5	283.2	243.7	216.1
June	324.7	288.3	251.0	317.7	232.7
July	398.7	299.9	239.8	321.6	294.7
Aug.	414.9	312.3	313.1	281.2	275.3
Sept.	347.7	323.2	300.9	207.1	234.3
Oct.	.....	261.8	357.7	202.1	225.8
Nov.	.....	299.8	301.7	198.4	208.2
Dec.	.....	354.1	389.4	209.5	199.7
Ave.	.....	$295.9	$266.4	$242.8	$222.3



Nondestructive Production For Steel Tubing . . . . .

Locates defects in any part or in entire tube. Defects 1/8-inch axially or half wall thickness radially are reliably indicated. By eliminating defective tubes ahead of processing, costs are cut

■ AS A RESULT of the demand for some form of nondestructive test which is not greatly dependent on the physical properties of a tube and which is entirely independent of the magnetic properties of the tube, a variation of the well-known Sperry rail detector system has been developed by Sperry Products Inc., Hoboken, N. J. This method affords reliable detection of defects in steel tubing after fabrication of the tube.

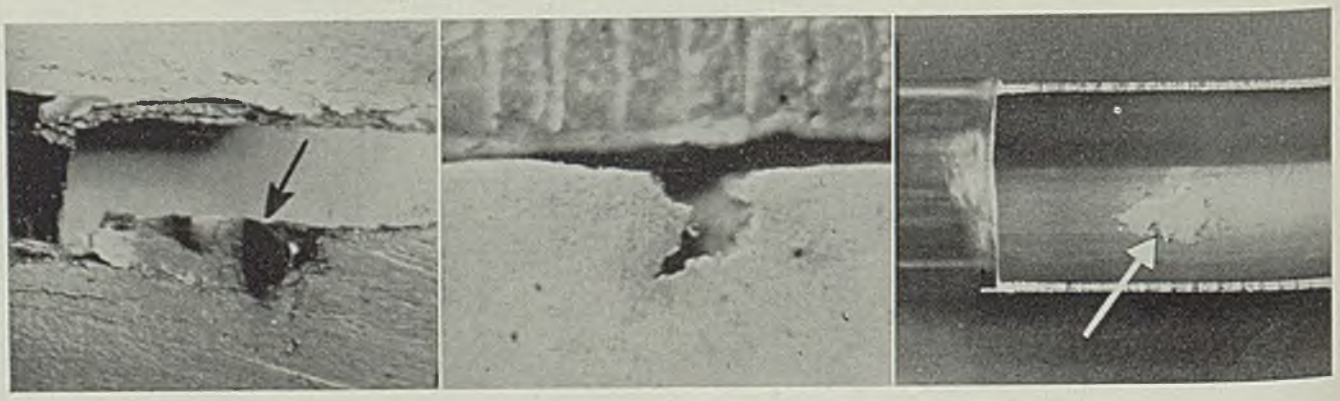
While other electromagnetic testing equipment has been in use for some time, satisfactory testing of magnetic materials has proved impractical because of the inability of equipment to distinguish between the electrical effect of real material defects and the resulting effect of permeability variations, hardness variations or local magnetization.

The recently developed system employs a set of energizing coils and a set of detector coils mounted on a table with amplifiers and drive rolls, controls, and auxiliary equipment and designed so a medium frequency alternating current is induced in a circular direction in the tube. By the newly developed method, this induced current is distributed throughout the tube so magnetic materials become as easily tested as nonmagnetic.

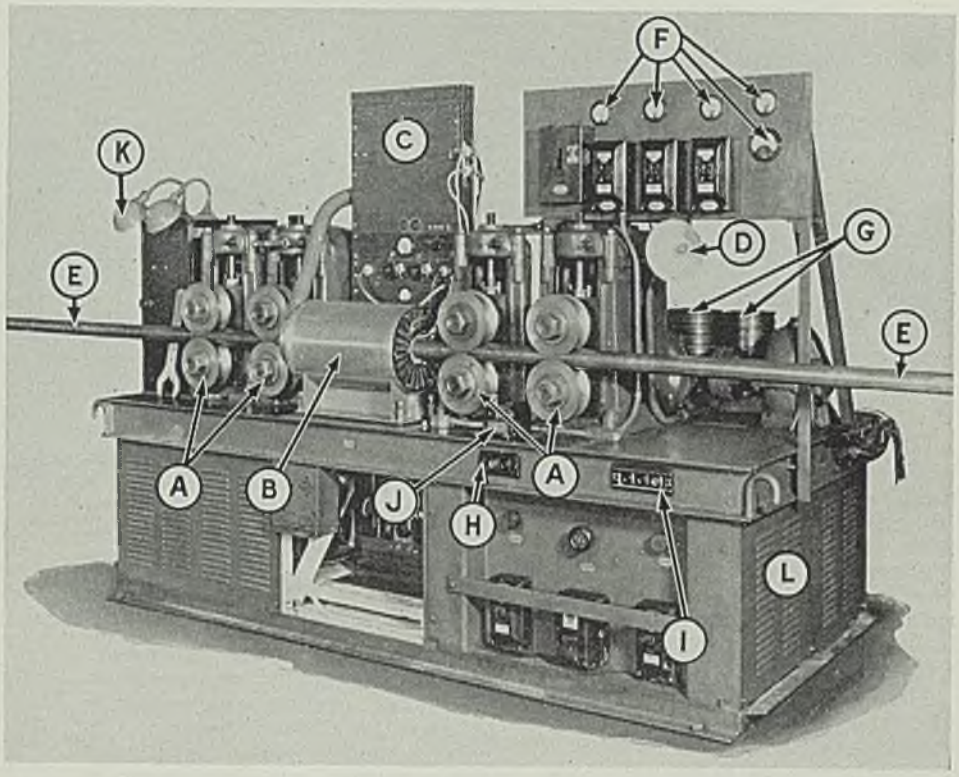
The method is suitable for detecting defects anywhere in the cross section of the tube. It will indicate the pressure of defects totally enclosed in the wall or extending from either the outer or inner surfaces. Types of defects which can be detected include slivers, seams, dents, leakers in welds, etc. Defects as small as 1/8-inch long with a depth equal to one-half wall thickness can be reliably detected. Many smaller defects often are found in practice. Operation can be set for either automatic or for operator supervision. When set for the automatic control, tube movement through the equipment stops at each defect signal.

Already the system has been tested thoroughly in regular mill inspection service on commercial tubing. Present operating range covers diameters from

Types of defects detected by new method: Left, sliver type external surface defect in 1¼-inch 16-gage seamless tube, first expanded and then broken. Center, end view of plug-expanded section from a 2-inch 13-gage seamless tube showing depth of external short seam. Scale divisions alongside and above represent thousandths of an inch. Right, surface defect on inside of 1¼-inch 16-gage tube



Test



Tube detector equipment for production inspection work in mills

½ to 2½ inches and gages from 22 through 7 B.w.g.

Commercial inspection is carried out at testing rates suiting the particular case, depending upon the handling facilities available and the degree of inspection required. The testing equipment can be calibrated quickly to operate on any diameter and gage in its range. Sensitivity can be adjusted according to the minimum size of defects which it is desired to detect. Performance of the detecting circuits and mechanism is essentially independent of the operating speed throughout the range from 15 to 100 feet per minute.

Main advantage of the system is the assured quality control it provides. It permits a tubing manufacturer to maintain highest standards of inspection in step with the latest scientific developments, and at the same time it does not form a bottleneck in production operations. Its extreme sensitivity permits detection of tube defects in excess of those detectable by other methods.

Also by suitable calibration, it is possible to limit detection to defects of a certain minimum size.

Such an inspection method helps in research and development by giving more accurate information as to defects in production and so aids in developing improved manufacturing processes. Another advantage is the elimination of scrap resulting from destructive tests.

An essential feature of the new system is the elimination of magnetic characteristics of the material from influencing the test. Detection of a defect results from the displacement of the alternating testing current—a new detecting principle.

The detector equipment is compactly constructed as can be seen from the accompanying illustration. It can be located conveniently in any tube mill or tube production setup. Simple and efficient operation by one man is facilitated by table mounting of amplifiers, energizing and detector coils, drive rolls and controls. Underneath the table are mounted a motor-generator set for supplying energizing current, roll drive motor and other related parts. Power required to operate the system is supplied easily through a single conduit connection to any convenient source.

The entire equipment is easily operated by mill inspection department personnel and functions as the final test for defects either throughout the entire tube or as a test of the welded portion only in welded tube. The automatic control permits the operator to devote his entire attention to tube handling, loading and visual checking if desired. The automatic control stops the tube under test on passage of a defect through the detecting mechanism, requiring manual restart and consequent check and rejection by the machine operator.

When switched to "manual control," a high-speed indicator lamp informs the operator of each defect as it goes through and the automatic stop is disconnected.

Where the percentage of rejection is low, the automatic control feature is especially valuable. Where the percentage of rejections runs unusually high as the result of some poor production control, the manual control possibly is most desirable.

Accompanying view shows a set of eight tube feed rollers used to carry the tube through the energizing and detection coil assembly and to maintain the position of the tube accurately in that assembly. These cast iron rollers are ground to the exact contour of the particular tube size being handled. In fact it has been found commercially feasible to utilize one

Types of defects detected by new method: Left, a discontinuous defective weld in 1½-inch 12-gage tubing. Center, this defect in a 1½-inch 16-gage tube was not visible with a plug expanding test but shows under the microscope. Right, another discontinuous defective weld in a 1½-inch 12-gage tube

set of rolls for several tube diameters within a limited range so the machine may require, for example, 10 sets of rolls to handle 20 or 30 tube sizes. The rolls are interchangeable, a complete readjustment of the tube clearance through the rolls and realignment of the energizing coil assembly requiring only a few minutes.

The guide rolls are driven by a 2-horsepower variable-speed direct-current motor. Each stand is bevel-gear connected to a line shaft and coupled through a reduction gear to the drive motor. Accurate adjustment finely controllable is provided for the vertical position of the upper rolls to permit maintenance of exact tube clearance through the rolls without damage to the tubing.

The energizing coil B is a specially constructed solenoid supplying energy for testing the tube and providing a mounting medium for the detecting mechanism which locates the defects. No part of this assembly touches the tube—both the direct-current and alternating-current energy are fed to the tube to be tested by induction. Defect detection is accomplished by means of detector coils arranged either to test, for example, a quadrant of the tube or the entire circumference of the tube.

The circular or segmental units incorporating these detector coils are interchangeable and quickly removable from the energizing coil assembly. Each searching unit can be used to test tubes of the desired diameter or tubes not more than ⅛-inch smaller. These searching units slide into the coil assembly and are locked in place, the necessary circuit connections being made by disconnect plugs so no adjustment of the searching unit is necessary.

Detection control panel C carries all electronic equipment used to amplify the searching unit output sufficiently to operate a high-speed visual signal device and the motor-control relay. The defect signal passing through this panel is adjusted in phase relative to a reference voltage, is amplified, filtered, re-amplified and applied to a combination of electronic and high-sensitivity galvanometer-type relay circuits which operate the signal and control devices. Circuits are independent of tube speed and so permit stationary check of operating sensitivity or performance on known defects as well as checking tube as it moves through the mechanism.

Upper speed limit of this equipment is determined by response speed of the relays and is well above maximum speeds involved in tube production operations at present—the 100-feet-per-minute rate previously mentioned.

Sensitivity is adjusted by two controls and is readable directly on two high-impedance voltmeters which afford continuous indication of the setting.

The required operating sensitivity needed for rejecting a certain degree of defect can be set up quickly by the operator and checked against either a calibration circuit or against performance of the equipment in checking a similar-sized tube containing defects whose degree and type are known. Defects equivalent to a size ⅛-inch long axially or one-half the wall thickness in depth radially are practically detectable over and above other variables encountered in production testing.

Production experience has in fact shown that a number of defects of much smaller order of magnitude than these can be detected reliably. The high-speed visual light D is a neon gas lamp of the commercial 2-watt type actuated by the detector circuit. This indicator, supplemented by any other type of indicator or by high-powered instantaneous gas lamp actuated from the motor relays, may be mounted in a suitable control position such as at the feed roll stand or at other places most convenient for the mill operator.

The tube on test E is 2½ inches in diameter.

Equipment F includes meters for reading adjustment and for providing a continuous check on alternating test current, on direct test current, on line voltage, on tube speed.

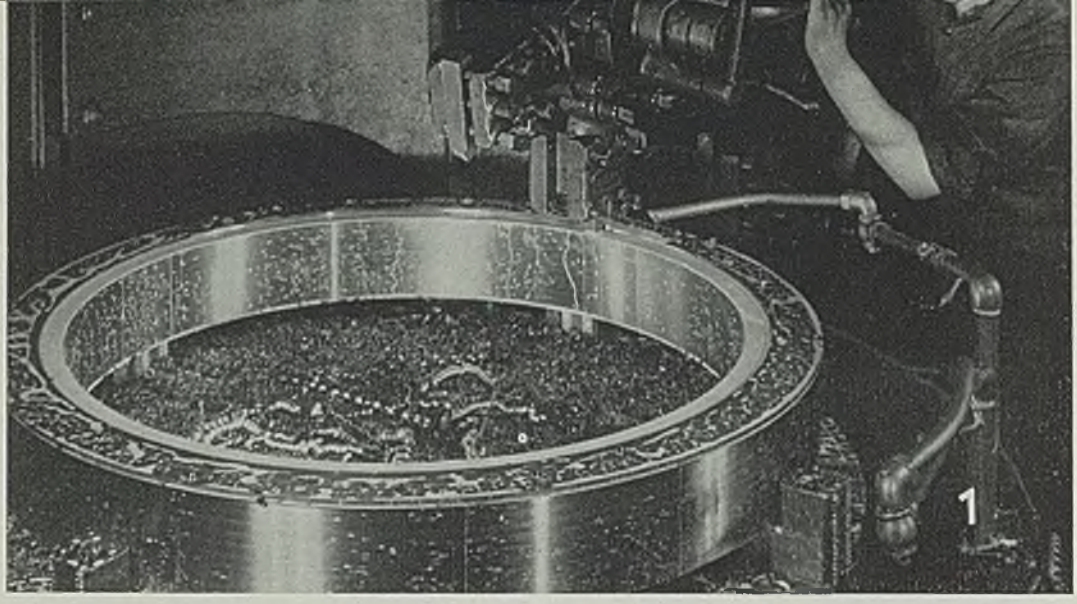
Spare rolls at G can be changed to accommodate a large range of tube diameters. Push-button controller H is provided as a disconnect switching device for all components of equipment except the tube drive motor. In another design for the same equipment where alternating current tube drive motors are utilized, this controller operates a contactor serving as a disconnect for the complete equipment.

Push-button starter I is provided for forward starting, manual stopping and reversing where a repeat test may be required on a particular tube. The equipment is completely reversible and so can be operated continuously in either direction, providing the demagnetizing equipment is supplied in duplicate. No demagnetizer is shown, although the transformer used to supply the demagnitizer is shown below the energizing coil.

Drive selector J provides choice between automatic and manual control. In the automatic position, the tube stops automatically when a defect is encountered. The tube then is started traveling through the machine again by means of the manual push-button starter. In the manual position, a defect is signaled by the visual signal but the tube continues through the machine without stopping. This is to save time in cases where tube with the defect is immediately condemned and further examination at that time is unnecessary.

The inspection lights K help the operator to visually inspect the nature of the defect when the defect is visible. In production work on high-quality tubing, only a small number of total defects are visible, however. See accompanying

(*Please turn to Page* 75)



Turning Costs Halved

■ AN EXTENSIVE experimental program with tungsten carbide tools at Nuttal works of Westinghouse Electric & Mfg. Co., Pittsburgh, shows that from the production point of view the reduction in tooling costs may be a stronger reason for their use than even the greater production speeds and higher accuracy they permit.

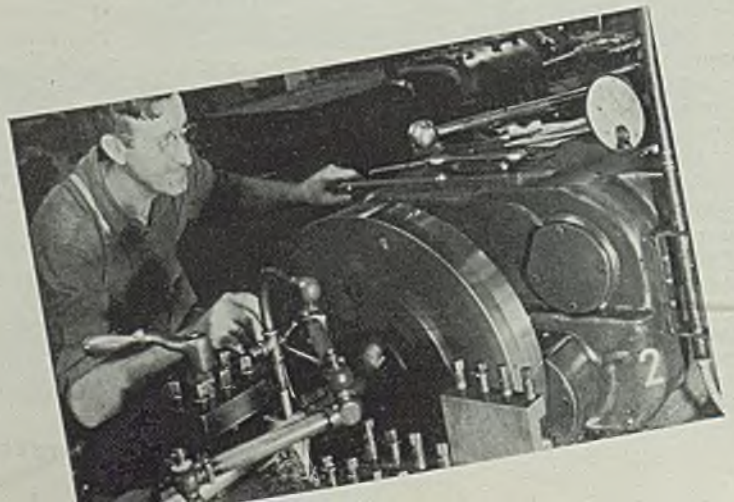
For example, Fig. 1 shows a ring gear made of 0.40 to 0.50 per cent carbon, heat treated to a hardness of 350 brinell. Some 218 cubic inches of metal is removed in turning. Cutting speed is 180 feet per minute, feed is 0.018-inch per minute. Carbide tools turn both inside and outside diameters as well as face of gear. Finish produced is smooth enough to meet close tolerances. Bore is accurate enough to obviate the usual grinding. On a comparable basis, costs of turning this gear with tungsten carbide and high-speed tools is:

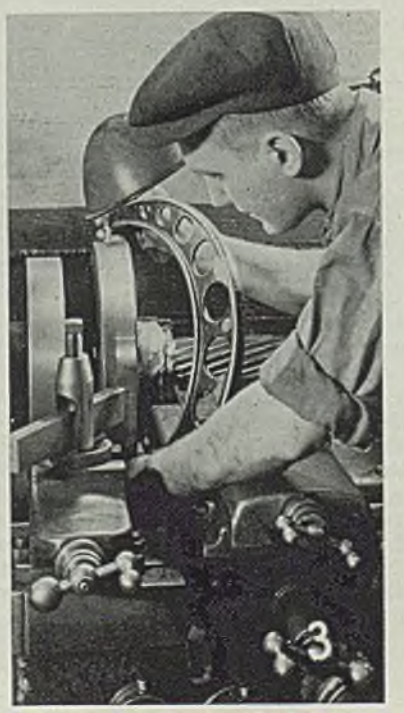
	½	3
Average number rings per tool grind		
Cubic inches metal removed for each tool grind	109	1090
Number of grinds per tool	30	17
Number of rings per tool	15	85
Average cost per tool	$8.00	$24.00
Turning	4.90	3.53
Hours allowed per ring		
Grinding bore	2.70	...
Tool cost per ring	1.06	.53
Tool grinding cost per ring	2.32	.19
Labor costs per ring	4.20	3.03
Total cost per ring	$7.58	$3.69

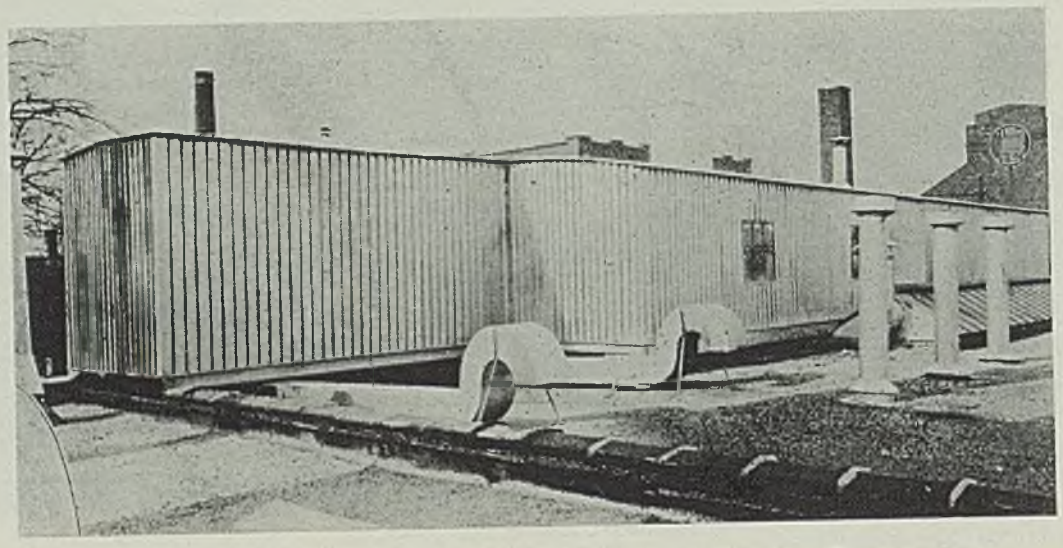
On this gear, then, the use of carbide tools instead of high-speed steel saved $3.89, or 51 per cent. Similar savings were discovered in many other case studies.

On lathes where carbide tools are employed, the operator keeps constant check on their sharpness by watching an ammeter, Fig. 2, which measures the current drawn by the driving motor. Should the current be too high, the operator knows instantly that it is time to insert a new carbide tool. Such facts are especially important for carbide tools as tiny hairline cracks are formed if heavy work is done with a dull cutting edge.

The lathe operator in Fig. 3 is measuring the outside diameter of gear blank being turned down to finished dimensions by carbide tools which have replaced grinding for this operation. A considerable time saving is possible because finished dimensions can be attained from a rough blank with one cut using carbide tools, whereas a number of grinds were formerly necessary to accomplish the same objective.







The new drying oven on roof of De Foe Finishing Co. plant, Chicago, is constructed entirely of steel. Photos courtesy R. C. Mahon Co., Detroit

Drying Oven on Roof Is Feature of Enlarged Finishing Plant

By erecting new continuous drying oven on roof, finishing plant saves cost of new land and building, yet it is enabled to triple production capacity and discard 10 box-type ovens. New multiple operator spray booth and 500-foot conveyor also part of system. Extra colors are applied to masked work as it spins on special fixtures in small auxiliary spray booth

By H. H. SLAWSON

■ STEEL played a stellar role in the new finishing facilities installed early this year in the plant of De Foe Finishing Co., 1752 North Kimball avenue, Chicago. Improvements include a new gas-fired drying oven of the continuous conveyor type and a new Hydro-Filter spray booth of the latest design, together with a continuous overhead trolley conveyor 500 feet long linking the spray booth on the ground floor with the oven on the roof. This complete finishing system was designed and installed by R. C. Mahon Co. of Detroit and Chicago.

The outstanding feature of the entire installation, from the standpoint of material used, is the drying oven on the roof. Built entirely of steel, this structure is 106 feet long with cross section dimensions of 9 x 12 feet. Interlocking steel sheeting of ribbed panel design is employed. Outer walls of the oven are of 20-gage galvanealed steel, each panel being 12 inches wide and "button punched" to adjoining panels.

Lining the oven inside is a second wall of 20-gage steel paneling attached to the outer wall by sheet metal clips every 3 feet along the length of the panel. Between these two walls is a 5-inch layer of blanket rock wool for insulation, supported by chicken wire netting.

Oven frame work is structural steel channels and I-beams supported on the factory's existing roof beams, which are built-up plate girders. Angle iron framing is used inside the oven to support the conveyor and serve as reinforcing for wall and roof panels. The oven floor is built of interlocking steel decking with 5½ inches of rock wool block insulation.

The equipment house, sheltering gas heater and blower fans, adjoins the oven proper and follows the same general construction design except that its walls and floor are not insulated.

For 30 years the De Foe Finishing Co. has performed a specialized industrial finishing service for manufacturers in Chicago and within a 200-mile radius of that city. Demand is made daily for the handling of an infinite variety of metal and plastic objects of all sizes, shapes and weights. These range from bulky beverage dispensing cabinets, stove parts, stoker housings, office furniture, accounting machines, radios, photographs and household appliances down to tiny novelties such as ash trays.

Prior to the modernization, 35 gas-fired box or truck ovens were used, which often necessitated much rehandling of products during finishing operations. Constant watch also had to be maintained over temperature conditions, subject always to the possibility of human error.

The new completely automatic oven has enabled the management to discard 10 of these older style ovens. At the same time, production capacity was greatly increased and automatic temperature control provided. So that nothing might be left to chance, much study was devoted to engineering and production problems prior to actual erection of the new facilities. The result, say De Foe executives, makes their modernized plant one of the outstanding industrial finishing establishments in the Chicago area.

"Selection of a site for the oven was one of the first problems to be solved," related Edward G. De Foe, company president. "Floor space in the factory was already taxed to capacity and it looked as if we might have to make an investment for additional land and a new building.

"At the rear of our 3-story main building, however, is a single-story

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TO relieve congested machine shops or press rooms, look for hidden plant capacity in your present production set-up. What is this hidden plant capacity? It is the hours lost at each machine through shutdowns caused by poor tool performance. Every time a tool must be re-ground or replaced, it ties up the production of one machine. Multiply this by the number of shutdowns caused by prematurely dull, broken or worn tools, and you will readily see how much hidden capacity is being tied up in your plant.

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extension whose roof is supported by heavy steel beams. Tests proved that these would be sufficiently strong to support the weight of the oven. This location is thus in space that would not otherwise be utilized. The rock wool insulation eliminates need for any auxiliary housing to prevent outdoor weather conditions from influencing oven temperature or to guard against loss of heat outward."

Had brick or other building material been used for oven walls, it was also pointed out, structural changes would have been necessary within the existing building at additional expense. Use of the prefabricated steel sheeting with its ingenious design of parts permitted rapid construction with consequent lower erection costs.

The heater unit, fans and motors for operating the oven are sheltered in the equipment house to which the gas for fuel is piped. On the heater are four burners which can be used singly or in combination and which have a heating capacity of 1,000,000 B.t.u. per hour, sufficient to produce temperatures up to 450 degrees Fahr. in the oven.

Before entering the heating chamber, air is filtered to remove dust and other foreign matter. After being raised to the desired temperature, it is delivered into the oven by a centrifugal fan. A complete duct system in the oven provides an even heat to every corner, and a large part of the air is then drawn back to the heater for reheating and recirculating. This recirculation feature affords considerable reduction in gas consumption as contrasted with what would be required if entire input had to be raised to oven temperature. Thermostatic temperature controls hold oven temperature to within 5 degrees of that desired.

On the ground floor, a temperature and safety control panel automatically controls the heater on the roof. It also gives instant warning of any failure, such as a fuse blow-out or stoppage of gas flow.

When operations begin in the morning, the flick of a switch starts the oven's supply and exhaust fans, which operate for 5 minutes to clear from the oven any volatiles that may have collected there over night, thus insuring against explosion hazards. Through a set of air flow switches, a time delay unit is automatically put into operation.

On the control panel a pilot light indicates when the fans have started and a second light indicates when the time delay cycle has elapsed. Then, and not until then, is it possible to ignite the gas burners through a push button on the panel. This is done manually as one more safety measure. A spark plug first ignites the gas pilot from which main gas burners in the heater are lighted.

Meanwhile, in the shop the product to be finished has been unpacked in the receiving room, sent to the degreasing or solvent vapor bath for cleaning and girls have placed it on the new overhead trolley conveyor, which travels continuously along the production line. This conveyor is a single strand of Link-Belt drop-forged steel chain suspended at intervals by ball-bearing trolleys from an I-beam track. It is designed to pass around abrupt turns in the horizontal plane and to climb in gradual vertical curves to the oven on the roof. Then, after making a complete circuit through that, it descends to the ground floor starting point.

This multi-plane operation, as pointed out by Link-Belt engineers, permits the load to reach the roof without transfer and to travel through the shop high enough overhead and out of the way except at points where the load must be reached from ground level. Valuable floor space is thus freed for other use and products in transit on the conveyor are removed from the hazard of scratching or abrasion.

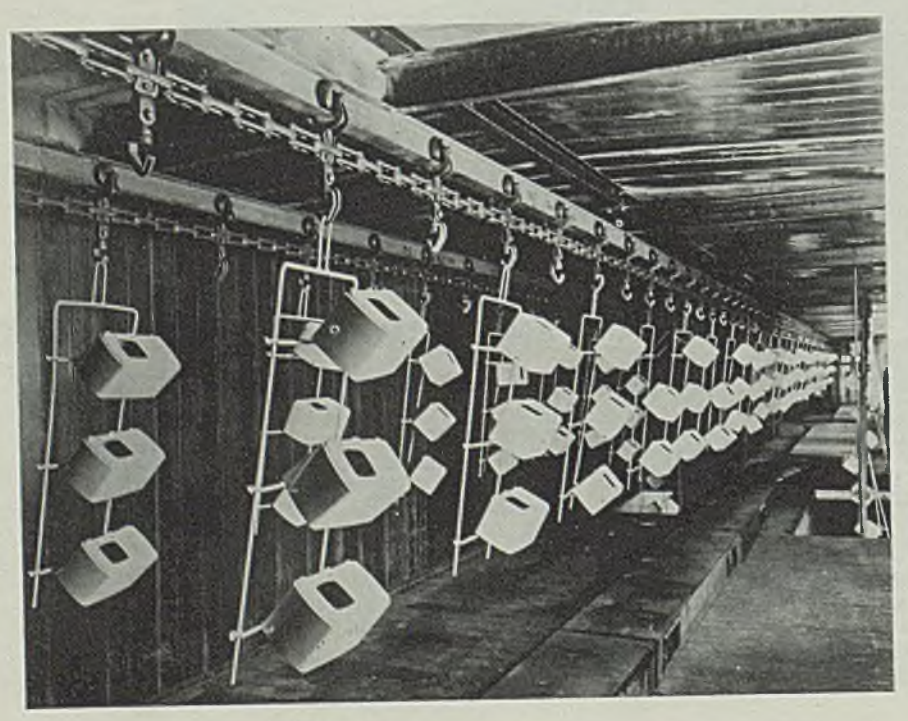
At 2-foot intervals on the steel chain belt are swiveled hooks from which are suspended racks or hangers to support the products to be finished. Specially designed to accommodate the varying sizes and shapes of articles handled, each rack will hold either a single large piece, such as a stoker housing, or a number of small items as shown in an accompanying illustration. Both conveyor capacity and oven heat can thus be utilized to greatest advantage and articles can be finished either individually or in batches.

Articles Taken to Spray Booth

From the loading point the conveyor carries the loaded rack around a turn to the new Hydro-Filter spray booth. This spray booth, 20 feet long and 8 feet high, accommodates easily a number of spray operators at one time.

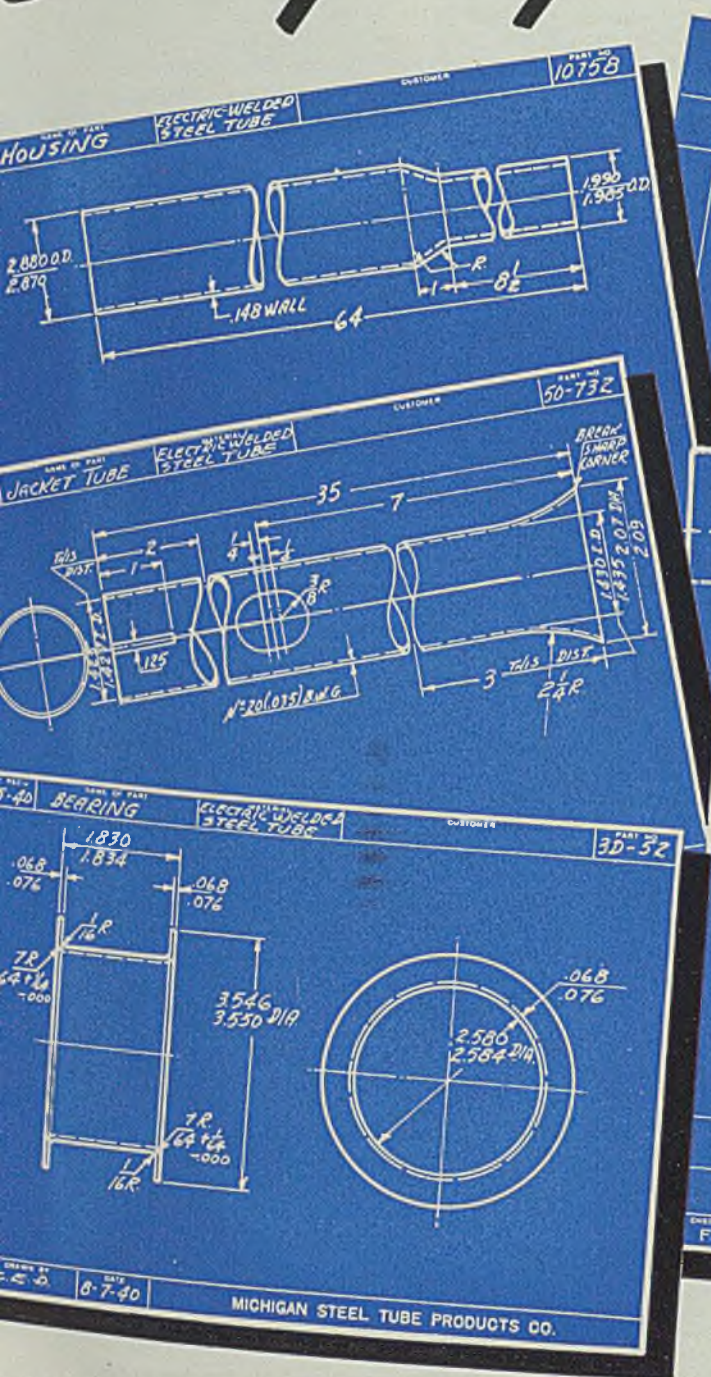
Forming its back wall flood sheet is a plate of auto body steel over which a thin sheet of water flows continuously and is recirculated to reduce water costs. As the spray operator directs his jet of liquid enamel or lacquer on the product which is passing along on the moving conveyor, the overspray strikes the water curtain and is deposited in a tank at its base, to be skimmed off and collected for disposal later. When one color is being used in considerable volume it is possible to salvage a portion of what would otherwise be wasted paint. At the same time, fumes from the spray are sucked into ducts at the base of the flood sheet and carried to the roof for discharge.

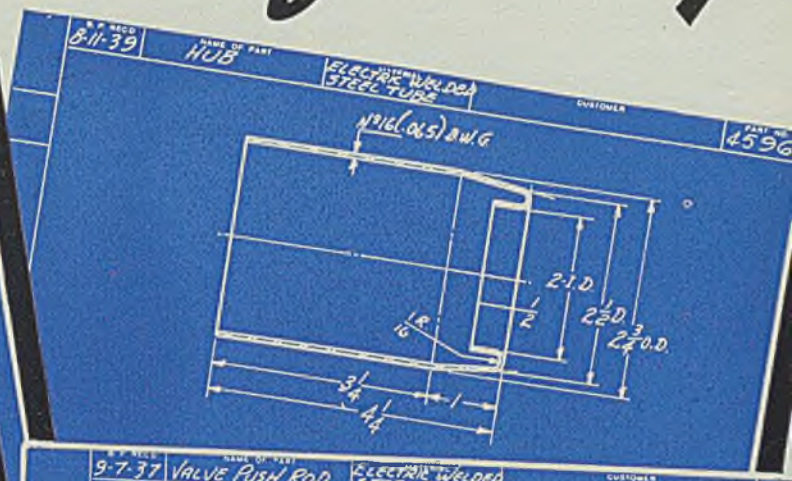
Noteworthy here is the "hump" in the conveyor rail which is contrived to lift the product on the rack to a height where its lower side can be reached conveniently for spraying, then to drop it for similar treatment of its upper side by another operator standing on the floor. The swiveled hook holding the rack permits the work to be

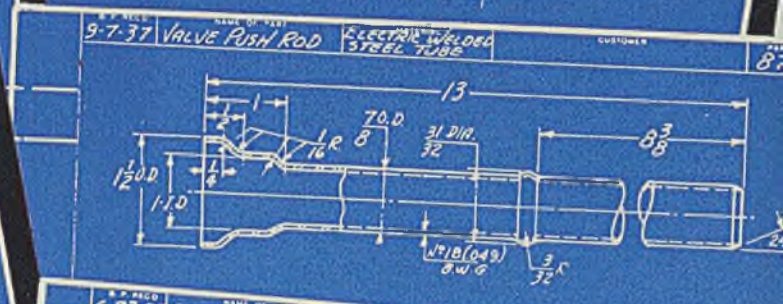


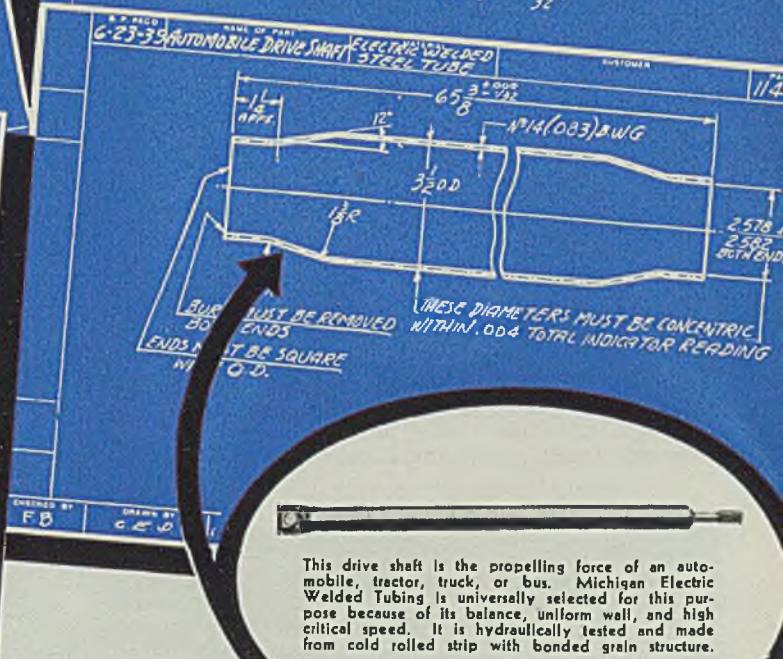
Interior of drying oven, showing rack loads of products suspended from overhead trolley conveyor which has brought them from floor below through opening in oven floor at right

Everyday line of Duty









This drive shaft is the propelling force of an automobile, tractor, truck, or bus. Michigan Electric Welded Tubing is universally selected for this purpose because of its balance, uniform wall, and high critical speed. It is hydraulically tested and made from cold rolled strip with bonded grain structure.

u do not have to look very far to discover in ese shop drawings of volume production parts pass- g daily through our plant, convincing evidence of r ability to produce shapes or supply analysis of el tubing to fit all your needs. Therefore, we are ying great stress on our product and our ability serve our government in the Nation's Defense ogram for such products as aeroplane tubing, echanical tubing, boiler and pressure tubing.

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swung around so all sides can be sprayed.

Leaving the spray booth, the conveyor gradually rises to the oven on the roof. Then, after passing down one side of the heated chamber and back on the other, it returns to the ground floor level.

Speed of the conveyor of course depends on time required for baking or drying in the oven. Since some finishes require more time than others, speed limits vary from 1.9 to 5.6 feet per minute so the precise time for baking any particular finish to the correct degree of hardness can be obtained.

Since each piece going through the oven receives identical drying and baking treatment, every article in any batch will come out with exactly the same finish and shade of coloring, an achievement which the experts consider a highly important characteristic of good finishing. Continuous travel also assures maximum utilization of the oven facilities.

All production operations throughout the shop are synchronized with the oven speed, but both the girls who load and unload the racks and the spray operators have ample time to complete their tasks. If necessary, however, when the oven conveyor is moving at the higher speeds, one operator can spray only one side of the product, and, as the line travels onward, the next operator sprays another side and so on until the finishing is complete.

For handling products involving two or more colors, the equipment includes a new but smaller spray booth of conventional design, except that it possesses another short Link-Belt conveyor equipped with heads on which the product rests as it moves automatically past the sprayer at work bench height. These heads spin around horizontally, so that after masks are adjusted on the work, the operator can readily reach all parts of the object calling for the extra colors. The short auxiliary conveyor extends beyond the booth walls on either side and so permits loading and unloading by a helper outside the spray zone.

It was because of a greatly increased volume of business last year that the company was impelled to undertake complete modernization of production facilities, Mr. De Foe explained.

"Naturally," he said, "we are very much pleased with the new equipment and the production system we have worked out in the plant. Eventually it will enable us to *triple* production volume capacity, handle a wider variety of products and do a finishing job on each that is uniform in quality, color and hardness of finish."

New Adjustable Die Sets Increase Production and Lower Costs

■ NEW ADJUSTABLE die sets which lower costs and reduce the time required to get into production for perforating and notching sheet metal are announced by S. B. Whistler & Sons Inc., 748-56 Military road, Buffalo. Made in various sizes, they permit much closer grouping of punches and strippers.

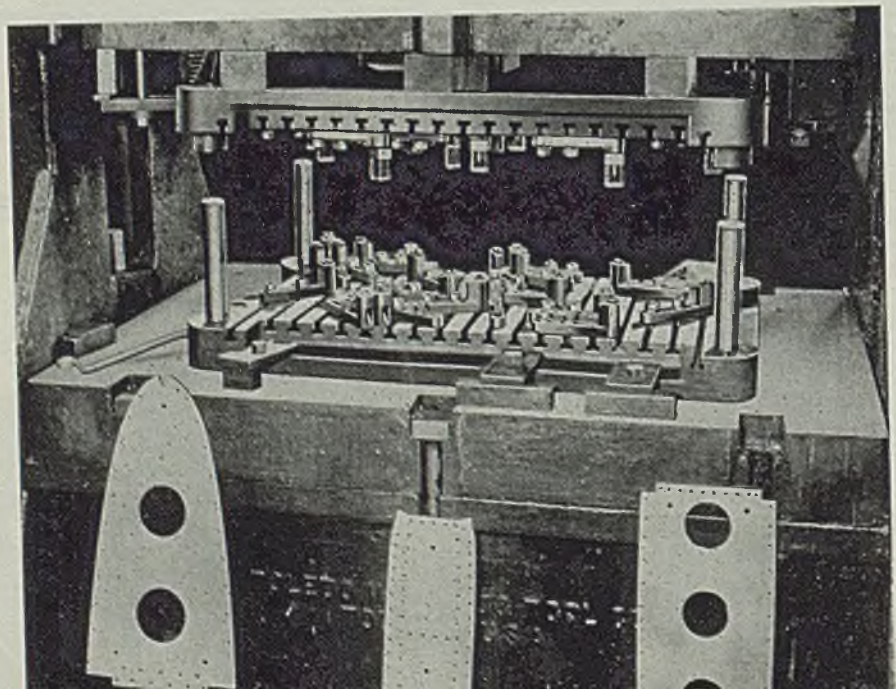
An Eastern plant recently had occasion to make profitable use of these die sets. It had the problem of producing quickly a limited quantity each of some thirty airplane wing and fuselage sections, some of these sections requiring more than fifty perforations. These new die sets, though specially made, were set up within three weeks' time, ready for production, and at a cost of approximately twenty times less than other methods.

Once in the possession of the user, these sets may be rearranged as often as the manufacturer desires. Various sizes of punches for perforating and notching can be arranged in different positions to suit requirements of the job in hand. Even a difficult arrangement may be completed and press operations started within a matter of hours. The setups can be made by the operator while the die set is right on the press.

Being available in stock sizes from 0 to 1¼ inches, most punching arrangements can be made without any loss of time, and, because of compact design, press operations are reduced to a minimum through permissibility of close grouping of a larger number of dies in a given area.

In the foreground of the accompanying illustration are several airplane parts perforated by Paul & Beekman, division of Philadelphia Lawn Mower Mfg. Co., Philadelphia.

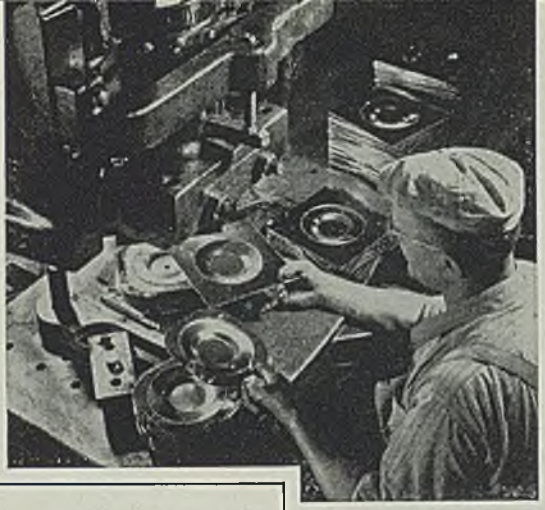
The illustration shows some of the new die sets on the bed of the press. In the foreground are several airplane parts perforated by these units

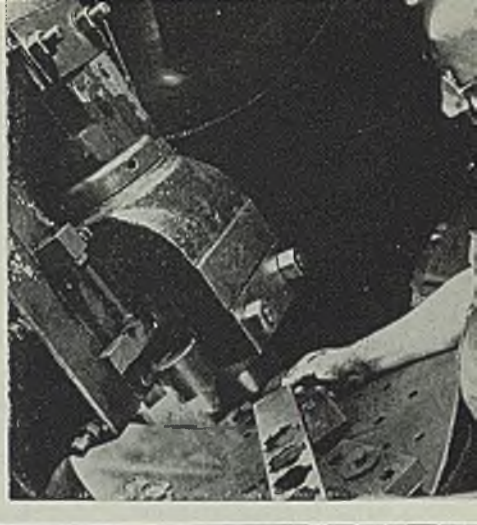


Nonrust Coating Protects Stored Steel

■ Wayne Chemical Products Co., 9502 Copeland street, Detroit, announces a spray pump and nonrust oil for use in protecting steel from corrosion. Two kinds of oils are offered for this purpose—No. 20 Protex and F. B. Protex. The former is used on bundles of steel stored from a few days to a few months, and the latter, on bundles being stored for longer periods.

With the pump one man can seal the outside edge of hundreds of tons of steel bundles. The pump will throw either a spray or stream and its tank holds 5 gallons of the solution. It also is equipped so that a worker may carry it on his back.





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Many manufacturers have discovered that American Quality Cold Rolled Strip Steel fabricates more easily and is doing an outstanding job in many places where more expensive metals were formerly used. The cold rolling process gives this product a smooth, eye-appealing surface which is available in a variety of finishes.

You will find it well worth your while to investigate the many ways in which American Quality Cold Rolled Strip can ease your production worries and cut costs. Our engineers and metallurgists have been helpful in planning the economical application of Cold Rolled Strip Steel to the needs of many manufacturers. They offer you a valuable service.

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Cast

Foundry metallurgists now have results of intensive research which show how defects due to entrapped gas and imbedded sand can be minimized. Cast gear blanks meet most exacting demands

■ COINCIDENT with the development of new engineering standards, low alloy steels have assumed a prominent position in the modern foundry. The use of low alloy steels for castings is perhaps no better evidenced than in the production of gears and blanks. The design engineer has today, by consultation with the foundry metallurgist, the choice of alloy steel gears to fit any service requirement, no matter how exacting the demands. Certainly, this form of manufacture allows the designer great freedom in the choice of alloy as well as the economical incorporation of many design features.

Table I lists a few of the steels currently produced in cast blank gear forms. It also shows the fields of application and reasons for their use. Several of the compositions are interchangeable in respect to physical properties by adjustment of heat treatments. However, each composition has proved highly satisfactory for the uses referred to and possesses some distinct advantage for those conditions. Cast steel gears have given excellent performance in widely varying fields.

It must be borne in mind, however, that while highly acceptable physical properties are obtainable by intelligent alloying, such properties of the steel itself are rendered worthless if the casting contains serious foundry defects.

The founder's major concern in the production of any casting is the avoidance of defects due to the presence of gas, sand inclusions, hot tears and shrinkage cavities. This statement is especially true when applied to the casting of gear blanks, for the following reasons:

Cast gears are thoroughly explored by machining operations.

Machining operations are in almost every case more expensive than the purchasing of the castings. These machining operations are, in the majority of cases, at the customer's expense thus placing upon the user the absolute necessity of obtaining sound castings. No amount of foundry sales effort will convince a buyer that he is justified in spending time and money in machining operations frequently only to find the casting unusable.

Service demands are severe, thus rendering even

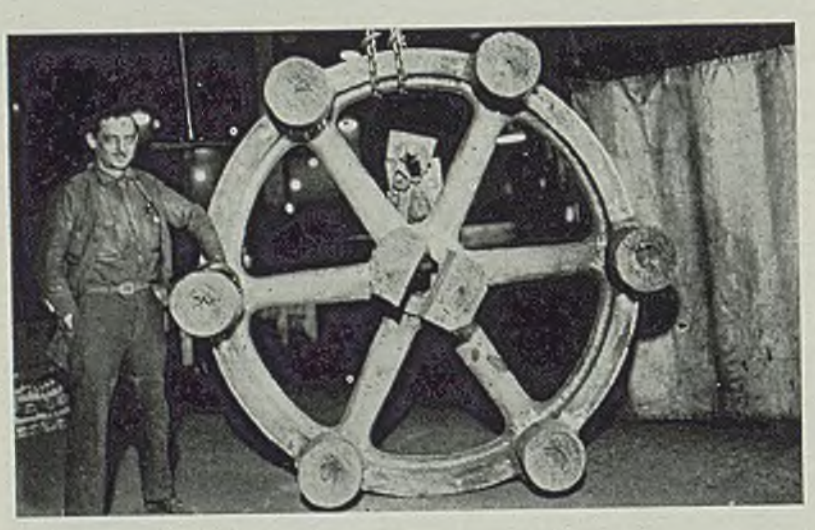


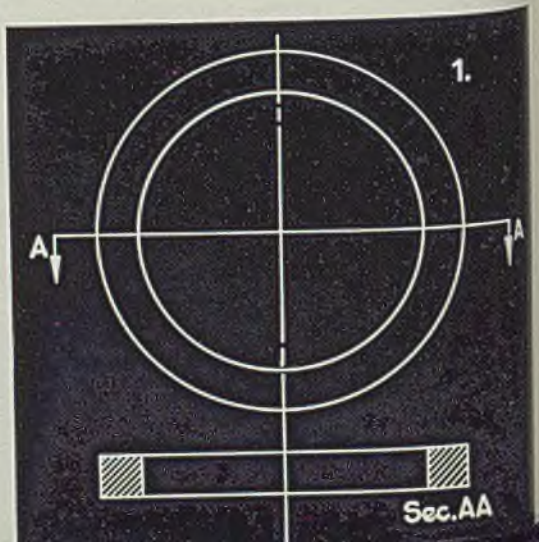
Fig. 1.—One type of gear blank—possibly the simplest

Fig. 2—Feeding method for use with blank, Fig. 1

Fig. 3—Feeding method for blank with hub integral

Fig. 4—This cross-section sketch illustrates the change in mass involved in a spoked blank

Fig. 6. (Left)—Spoked gear of large size, better designed as a ring or webbed blank



Steel Gears

By W. J. PHILLIPS
Sales Engineer
And
T. D. WEST
Foundry Supt.
The Symington-Gould Corp.
Rochester, N. Y.

slight defects objectionable from the standpoint of dependability.

A consideration of the above factors will show the cast steel gear is still a most economical answer to the question of dependable trouble-free power transmission. This enviable position of steel castings exists largely because of the control which the modern foundryman is able to exercise over his products.

Intensive research now has placed in the founder's hands information which was formerly totally lacking or incomplete. The results of investigations into methods of preparing steel for castings as well as methods of preparing sand and clays for molding purposes have rendered defects due to entrapped gas and imbedded sand a minimum danger.

However, the production of steel castings calls for much more than simply pouring gas-free metal into a properly prepared sand mold. The founder is confronted with the problem of controlling or alleviating the effects of three types of volume changes which take place during the cooling of the liquid metal from pouring temperatures to solid casting: A volume change due to liquid contraction, a volume change due to solidification, a volume change due to solid contraction.

The total of these may amount to as much as 10 per cent volume change during the process of casting a formation in the mold. The first volume change—that of liquid contraction—is of minor importance in determining the soundness of the finished casting. The second volume change, occurring during the change of metal phase from liquid to solid is by far the most important consideration of the steel founder. It is this change in phase, with accompanying decrease in volume, that is responsible for those major defects in improperly made castings—shrinkage cavities and internal tears.

It is this phase change also which, due to its magnitude in steel, accounts for the greater cost of such castings over those made from any other ferrous material.

It is true that the complexity of the problem of controlling the effects of this phase change varies in intensity from one casting design to another. Each individual pattern confronts the founder with a different problem in respect to the gating and heading to be employed in order to avoid the presence of tears and shrinkage cavities. It is in the solution of these problems that the steel founder may intelligently employ the principles developed by the researches of men such as Batty, Bull, Briggs and Gezelius.

Several illustrations of gear designs and foundry methods will serve to emphasize the above points.

Fig. 1 illustrates a gear type that is the simplest of all to produce sound and free from tears and shrinkage cavities. The feeding method employed in its production is shown in Fig. 2. This procedure was well described by George Batty, one of the first men in this country to demonstrate its effectiveness in the economical production of gear blanks. The solidification is controlled in an ideal manner; freezing starts at a point farthest removed from the feeding source and proceeds toward the head which is the last part to solidify, thus ensuring an ample supply of liquid metal to compensate for normal volume change from the liquid to the solid state.

The second general design type of blank is shown in Fig. 3. The feeding procedure here is the same as

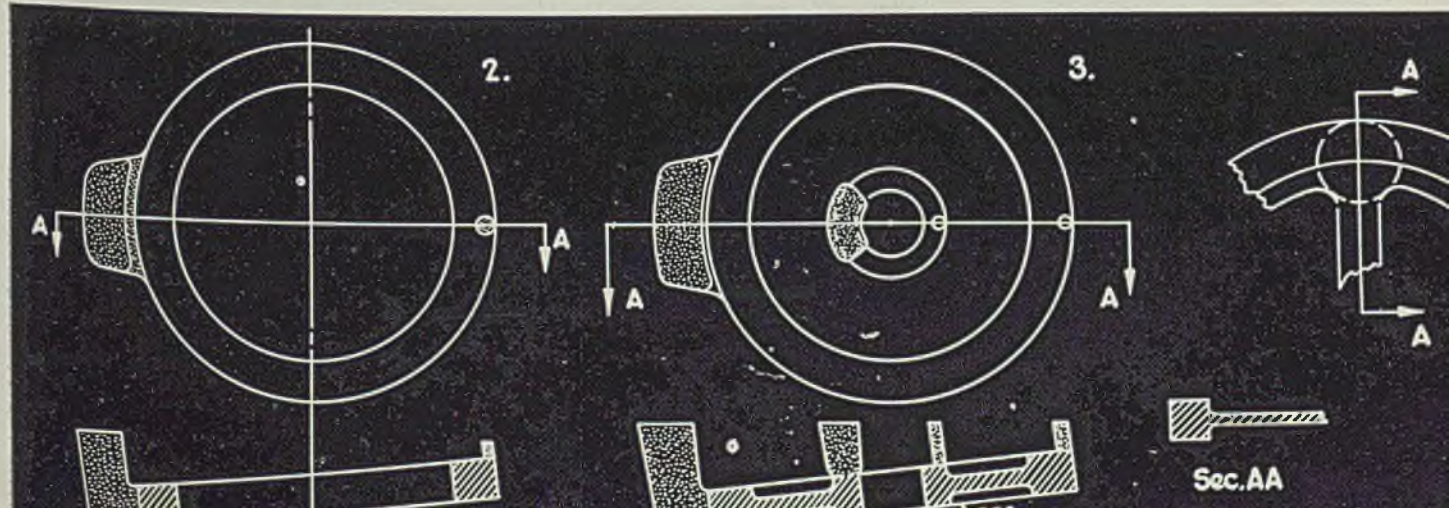


Fig. 5—Gear blank with hub and second riser as diagrammed in Fig. 3

that described in casting the ring gear, the only difference being the addition of a riser to the hub, Fig. 5. The hub riser is necessary in this case because of the abrupt changes in mass section from the rim to the web to the hub. It is necessary in this case to consider the hub of the gear as a separate casting distinct from the rim and web of the gear entity.

The third general gear design classification, the spoked gear, Figs. 4 and 6 presents a different picture entirely. It is not possible here to employ the principles of directional solidification as economically as in the first two instances mentioned. A comparison of the sketches shown will illustrate the fact that the foundry loss in unsalable metal is much greater in the case of the spoked gear than in either the ring or webbed blank. The reason for this is that solidification does not start at one point and proceed in one direction toward a riser.

The cross sectional sketch, Fig. 4, will readily illustrate the change in mass section encountered at each point where the spoke joins the rim. It can thus be seen (disregarding the freezing of the spoke itself) that final stages of solidification of the rim will start at a point in the rim midway between the spokes and proceed toward the junction of the spoke and rim.

Since the point of intersection of spoke and rim embodies the greatest mass concentration in the rim area, it will be the last part to solidify and will act as a feeder for the parts of the rim already freezing. Thus, unless ample provisions are made to dispose available liquid metal in the form of risers at these points, shrinkage cavities will occur and render the gear worthless.

There are, of course, various design ramifications embodied in the general term "spoked gears". The size and number of heads required to feed properly such gears will vary depending upon the ratio of the rim mass to spoke mass, upon the distance from one spoke intersection to another, and upon the possibility of using external chills to promote directional solidification.

A consideration of the sketches will readily illustrate the effect of design features upon foundry costs in gear production. Other forms of manufacture attempting to compete with the foundry in this field have not hesitated to recommend changes in design from spoked to webbed blanks. It should be the consideration of the design engineer that this change is also best suited to steel casting production. Cast steel gears have proved their worth over long years of service despite the fact that many such gears have been so designed as to tax the ingenuity of the steel founder in economically producing a dependable casting.

The data available today on methods of producing steel for castings as well as information on the preparation and handling of molding sands should, in well managed foundries, preclude the possibility of serious casting defects from these sources. It is then the responsibility of the founder to apply intelligently the principles of casting solidification and contraction so well expounded by Batty, Bull, Briggs and Gezelius to produce sound castings.

TABLE I—Alloy Steels Commonly Used for Gears

INTERMEDIATE MANGANESE

Chemical Composition

Carbon	Silicon	Manganese	Phos.	Sulfur
0.30-0.40	0.30-0.40	1.25-1.50	0.02	0.04

Heat Treatment

(a) Normalized and drawn
(b) Liquid quenched and drawn

Properties

	Tensile Strength, p.s.i.	Yield Point, p.s.i.	Elong. in 2" %	Red. of Area %
(a)	85000-95000	55000-60000	22-28	45-50
		Brinell—170 to 190		
(b)	90000-100000	60000-65000	22-25	40-50
		Brinell—190 to 210		

Applications: Machine tools, excavating and road machinery, general machinery gears.

Reasons: Low cost, greater strength and ductility than straight carbon gears, responds well to flame hardening.

INTERMEDIATE MANGANESE-MOLYBDENUM

Chemical Composition

Carbon	Silicon	Manganese	Molybdenum
0.25-0.35	0.30-0.40	1.25-1.50	0.30-0.50

Heat Treatment

(a) Normalized and drawn
(b) Liquid quenched and drawn

Properties

	Tensile Strength p.s.i.	Yield Point p.s.i.	Elong. in 2" %	Red. of Area %
(a)	90000-100000	65000-75000	25-30	55-60
		Brinell—190 to 210		
(b)	100000-110000	75000-85000	25-28	55-60
		Brinell—210 to 230		

Applications: Rolling mill machinery, mining machinery.

Reasons: Good impact resistance, excellent response to heat treatment, excellent machinability at high hardness.

COPPER-MOLYBDENUM

(SAE-4640 Analysis Modified)

Chemical Composition

Carbon	Silicon	Manganese	Copper	Mo
0.35-0.45	0.30-0.40	0.50-0.80	1.65-2.00	0.20-0.30

Heat Treatment

(a) Normalized and drawn
(b) Liquid quenched and drawn

Properties

	Tensile Strength p.s.i.	Yield Point p.s.i.	Elong. in 2" %	Red. of Area %
(a)	90000-100000	65000-75000	22-28	50-55
(b)	115000-125000	80000-90000	20-25	45-55
		Brinell—250 to 275		

Applications: Gears requiring high hardness with excellent resistance to impact and fatigue parts operating under high stress.

Reasons: Good response to heat treatment, excellent machinability at high hardness, lower cost than standard SAE-4640.

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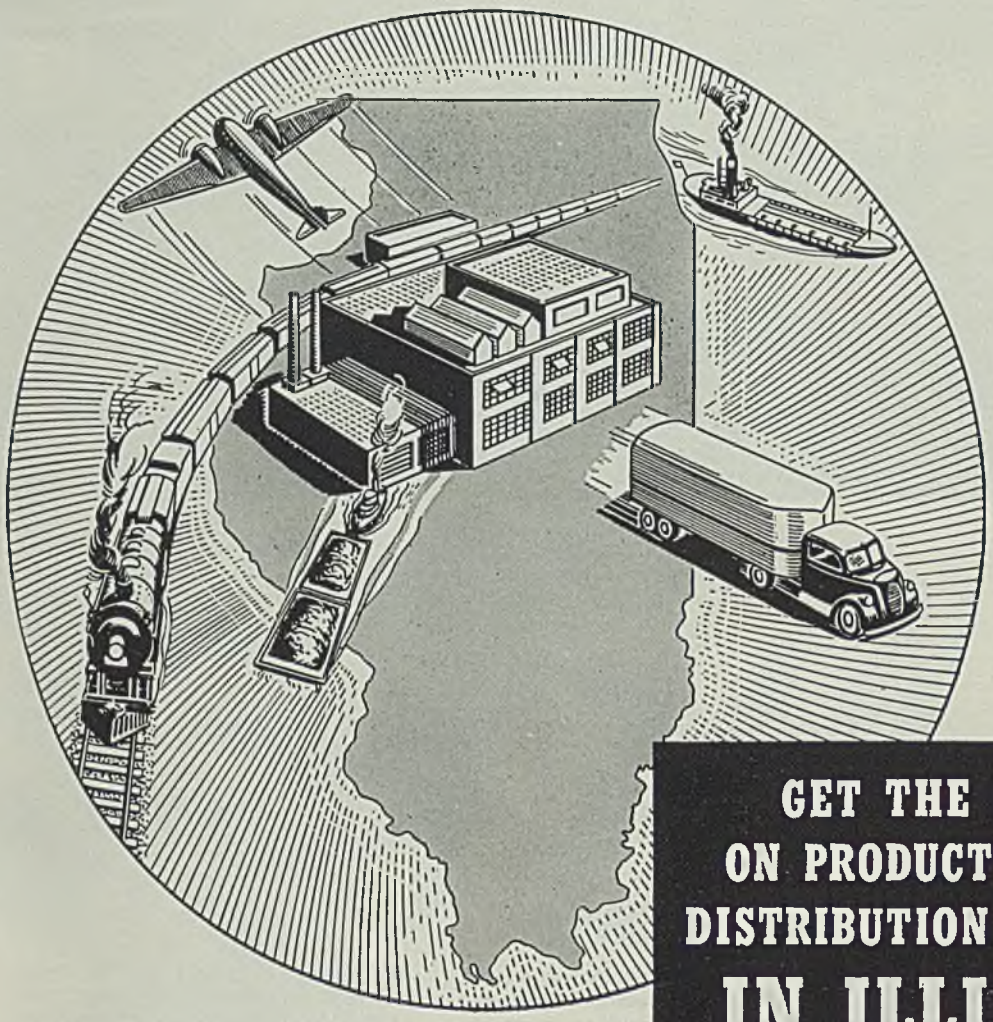


GET THE FACTS ON PRODUCTION AND DISTRIBUTION ECONOMY IN ILLINOIS

There is just one answer to the question of securing the most business from the huge Middle West Market. That is a plant or branch plant in Illinois, where the advantages offered to industry assure most profitable operations.

Production and distribution advantages are exceptional. Illinois produces or is the central receiving point for the raw materials essential to all types of manufacturing. The machinery requirements of industry are met by the many machine and tool manufacturers in Illinois, the second largest producing State of the Nation.

The transportation facilities of Illinois are unequalled. Illinois has the greatest railroad mileage of any industrial State, with direct service to all parts of the Nation. Illinois has the finest paved road system in the United States. Both rail and highway facilities serve all parts of Illinois, permitting a manufacturer to locate in whatever section of the State offers the most in accessibility to raw materials and labor supply. Both the Great Lakes-St. Lawrence Waterway, and the Lakes-to-the-Gulf Waterway serve Illinois, giving industries located in Illinois foreign trade advantages and access to the important Central and South American markets. Air services afford facilities for rapid transportation in emergencies, to all parts of the country.

Ample power supplies, abundant water, rich agricultural and mineral resources, low cost fuel, large labor supply, and the advantage of central location, are found in Illinois. Equitable labor laws contribute to industrial harmony. Illinois manufacturers pay NO State Income Tax, NO State Real Estate Tax, and NO State Machinery Tax.

Special Confidential Report to Executives

Get the facts on Illinois as they apply to your business. Write the Illinois Development Council at Springfield, Illinois, for data on raw materials, labor, taxes, power, fuel, transportation, and other facts pertaining to your business.

If you have some special problem in production or distribution, outline it in detail. If you desire a certain type of building, certain classification of workers, certain power requirements, or certain raw materials, state your needs and you will receive a special report on them. Your inquiry will, of course, be kept confidential. Write—

ILLINOIS DEVELOPMENT COUNCIL
STATE HOUSE • SPRINGFIELD, ILLINOIS

ILLINOIS

THE STATE OF BALANCED ADVANTAGES

Fig. 1. (Left)—Part of heat-treating department showing electric furnaces, gravity conveyors and automatic overhead cranes. Fig. 2. (Right)—Belt conveyors used for inspection and sorting permit a number of operators to work simultaneously to take care of a large belt load easily

BOLTS and NUTS

Production, heat treating, inspection and packing millions of small cold-forged parts daily makes handling costs extremely important. Automatic quenching from roller conveyors is typical of highly mechanized handling facilities which are employed to keep costs down to a minimum

By FRED B. JACOBS

■ PRODUCING millions of bolts, screws, threaded rods and many special cold-forged parts daily, Lamson & Sessions Co., at its West Eighty Fifth street plant, Cleveland, finds adequate mechanized handling facilities rate equal consideration with production equipment. With 225,000 square feet devoted to manufacturing operations, the plant includes a yard storage space, seven 1-story buildings, one 2-story building and a 4-story building.

The 1-story buildings include: Employment, cafeteria, rest rooms; machine and tool rooms; tool hardening and grinding, maintenance; presses and trimmers; wire drawing, cold heading, cold and hot bending; acid pickling; and power house.

First floor of the 2-story building is devoted to packing, shipping, cold-heading, wire and parts storage. Second floor provides for packing, roll threading and storage.

First floor of the 4-story building has facilities for cold heading and wire storage; the second floor for cold heading, drilling, slotting and tumbling; the third floor for pointing, cut threading, hand shaving, automatic drilling and screw machine work while the fourth floor is occupied by plating and heat-treating departments.

Adequate and efficient handling facilities for the tremendous volume of small parts made in such a plant include a number of interesting arrangements, some of which will be outlined briefly.

Raw steel stock in the shape of hot-rolled coils is shipped to the plant in gondola cars. Coils in 1-ton lots are picked up from these cars by a derrick with an electric hoist using a hook. Each ton hook load is placed on edge on the 4-wheel cradle trucks. Standing on edge, the coils can be removed easily by hooks or rolled off.

The trucks take the coils to the yard storage areas where they are stacked in sections according to size and materials. This is important as various sizes and materials must not become mixed. The coils are stacked in orderly piles, the coils being laid flat, one over another. The bottom coil of each pile rests on two 4 x 4-inch hard maple timbers about 4 feet long. Coils are of three weights—160, 300 or 600 pounds.

From yard storage, coils go to the pickling house using the same 4-wheel cradle trucks as for yard storage. In the pickling house, one of the 1-story buildings, all handling is taken care of by an overhead 2-ton electric trolley crane which is manipulated by hand push-button control. Pickling vat hooks are monel metal to resist the acid. From pickling and rinsing the coils are subjected to a liming operation and then are taken on steel cradle trucks to the wire drawing department in another nearby 1-story building.

In the wire-drawing department, the coils remain on the same trucks used to convey them from the pickling department, being stacked on edge so they can be removed readily as required. The coils are taken to the wire-drawing machine reels either by hand or by an overhead electric crane. The end of each coil is pointed. The wire-drawing machine draws the wire to the required size and coils the finished wire on a drum on the machine. Wire drawing is to reduce the hot-rolled stock to the correct finished size for the next manufacturing operation.

Cold-drawn coils are taken from wire-drawing machine drums and placed on skids or lift platforms by electric hoists. Each machine has its own jib crane and electric hoist. The skid platforms are picked up by lift trucks and conveyed to the cold heading departments where the coils are stored in piles in front of the cold headers. Cold heading is

LESS COST PER TON OF STEEL ROLLED

BARS

Pittsburgh Rolls Division manufactures rolls exclusively: It makes rolls for every rolling operation: It develops new and better rolls to meet changing trade conditions which require better rolled products. Only such intensive specialization can give satisfactory up-to-date roll service.

PITTSBURGH ROLLS

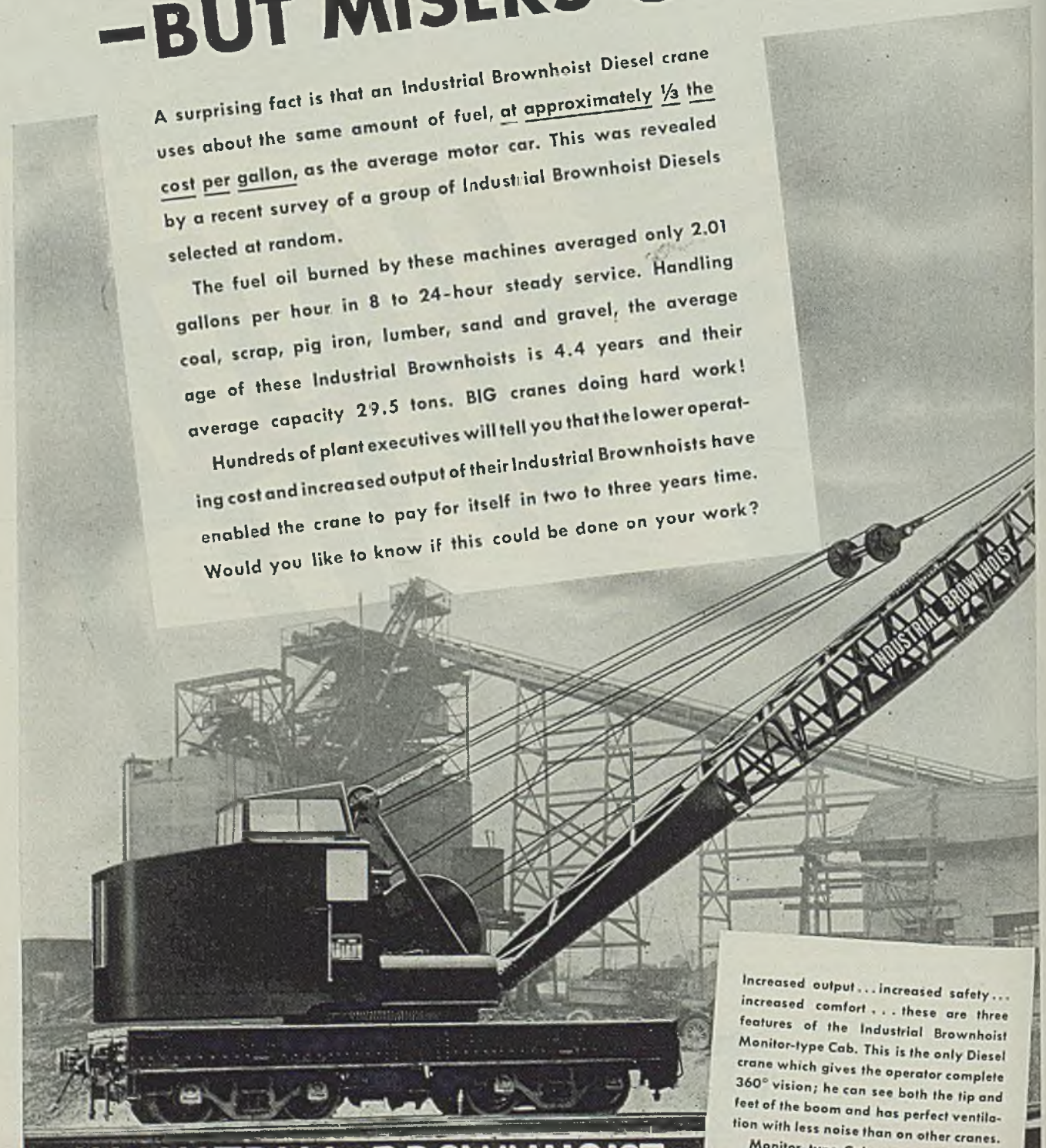
PITTSBURGH ROLLS DIVISION of BLAW-KNOX CO.—"Steel's Partner" • PITTSBURGH, PA.

GLUTTONS FOR WORK —BUT MISERS ON FUEL

A surprising fact is that an Industrial Brownhoist Diesel crane uses about the same amount of fuel, at approximately ⅓ the cost per gallon, as the average motor car. This was revealed by a recent survey of a group of Industrial Brownhoist Diesels selected at random.

The fuel oil burned by these machines averaged only 2.01 gallons per hour in 8 to 24-hour steady service. Handling coal, scrap, pig iron, lumber, sand and gravel, the average age of these Industrial Brownhoists is 4.4 years and their average capacity 29.5 tons. BIG cranes doing hard work!

Hundreds of plant executives will tell you that the lower operating cost and increased output of their Industrial Brownhoists have enabled the crane to pay for itself in two to three years time. Would you like to know if this could be done on your work?



Increased output . . . increased safety . . . increased comfort . . . these are three features of the Industrial Brownhoist Monitor-type Cab. This is the only Diesel crane which gives the operator complete 360° vision; he can see both the tip and feet of the boom and has perfect ventilation with less noise than on other cranes.

Monitor-type Cab cranes conform to standard clearances and provide ample head-room in the engine compartment.

INDUSTRIAL BROWNHOIST

BAY CITY, MICHIGAN

DISTRICT OFFICES: NEW YORK, PHILADELPHIA, PITTSBURGH, CLEVELAND, CHICAGO

Fig. 3. (Left)—Gravity conveyor station in packing department where parts are inspected, before being packed. Fig. 4. (Right)—Note two levels of this gravity roller conveyor in the packing department. These permit work to be dumped from tote boxes at one level into shipping kegs on the lower level and so facilitate packing operations

done in one of the single-story buildings, on the first floor of the 2-story building and on the second floor of the 4-story building. From the storage piles, the coils are rolled to the cold heading machines where they are placed on the machine reels by an electric monorail hoist. Sometimes, however, the coils are stored on the skid platforms which are then placed near the headers so the stock can be lifted directly by the electric hoist thus eliminating storage.

These handling operations are comparatively simple since wire coils are easily handled by good layout of machines, storage areas and monorail hoists. After the stock has been formed in the cold headers, one coil of wire has been made into thousands of bolts which fall into steel tote boxes underneath the machines. The tote boxes are placed on skid platforms and then lifted by hand-operated lift trucks of the regular type, which are pushed under the platforms. A platform load is from 1000 to 2000 pounds, depending on the size of individual pieces—the smaller the parts the heavier the box load. From 10 to 15 tote boxes are placed on each platform.

From the cold headers, the work is transferred in tote boxes on lift trucks to various other manufacturing departments such as threading, and so on; then to the heat-treating and plating departments on the fourth floor of the main building—providing heat treatment or plating is required. The parts are taken up an elevator on the lift trucks previously described, usually two trucks at a time.

In the heat-treating department, Fig. 1, electric hoists of 1-ton capacity run on overhead cranes and transfer the work in containers to and from the heat-treating furnaces to a roller conveyor for automatic quenching. From automatic quenching, the containers are delivered on a roller conveyor to an electric dump, where the product is again placed in tote boxes. The gravity conveyor that takes the tote boxes to the packing department is about 700 feet long and runs outside the building from the top floor of the 4-story building down to the second floor where the product is packed for shipping. From there, a spiral section takes care of the downward journey to the shipping department on the first floor.

In the plating department, also on the top floor of the 4-story building, work is handled by electric monorail hoists, the parts to be plated being placed in work baskets and carried to pickling tanks, rinse tanks and on to the plating barrels. The monorail hoists lift the plating barrels in and out of the plating tanks. It also handles the product to centrifuge baskets in which the work is rinsed in cold water, then in hot water, and finally centrifuged. Then the work is dumped into shop boxes which are placed on a roller conveyor. An automatic elevator conveys them to the roof from which they move on gravity rolls about 1000 feet to the packing department.

(*Please turn to Page* 72)

Biography of Thomas, Open Hearth Inventor

■ *Sidney Gilchrist Thomas*, by Lilian Gilchrist Thompson; cloth, 328 pages, 5¼ x 8 inches; published by Faber & Faber Ltd., London, for 12s 6d, net.

Andrew Carnegie once said of Sidney Gilchrist Thomas: "I never met a man who so carried me away, or who so completely separated in himself talent from that indescribable thing we call genius."

Thomas was only thirty-six when he died in 1885. Seven years before, while he was a minor clerk in a London police court, he had solved the problem of utilizing the phosphoric iron ores of England and the Continent, which before that time were thought to have little value. Today, fully 90 per cent of all steel made in the world is produced by the basic process which Thomas developed in collaboration with his cousin, Percy Gilchrist.

His biography, written by his sister, who is now 81 years old, is as much an autobiography as a biography. Almost the whole story of Thomas' life is told by means of his letters to his sister, to his cousins and others.

The book is a good deal more than an account of the developments leading to a major invention. It is the story of a man who, although a brilliant scientist, was also a keen observer and witty commentator on what went on around him in other than scientific fields. In particular, his accounts of two trips to America and of a round-the-world voyage would do credit to any reporter or professional travel writer.

Cold Rolled Strip Steel

Steel reduced under tension is more even in texture and more suitable for later processes that may be required in its utilization than when pressure rolling only is employed to impart proper temper

By T. B. MONTGOMERY

Switch Gear Division
Allis-Chalmers Mfg. Co.
Milwaukee

■ WHEN steel is cold reduced, it work hardens during the process, that is, its elastic limit or yield point approaches its ultimate strength. Thus, when tin plate stock, normally in coil form, leaves the cold-reducing mill at the desired gage, it is hard and brittle. In this condition, it cannot be formed satisfactorily by dies into tin cans, or other various products, and therefore, must be cleaned and annealed to reduce its hardness.

It is generally known that after steel has been heated and subsequently cooled, it is left with a dull surface and has little elasticity or ability to spring without permanent deformation; in other words, its elastic limit or yield point is reduced to a low value—its temper has been dissipated. This is far different from the condition which we are accustomed to see in the material after it has been formed into cans. There it has a highly finished surface and the required degree of elasticity or springiness.

Fig. 1 depicts the strip progressing from right to left through a 2-stand mill which takes coils from the annealing furnace and rolls them under tension to produce the desired surface finish and temper. The entry reel is used to provide back tension. This has been found to increase the effective work of the first stand of rolls which operate on the strip with relatively high pressure. This pressure is at times 2,000,000 pounds or more and is distributed over the width of the strip. Likewise, tension between the stands increases the effective work of stand No. 2.

In these stands the smaller rolls in contact with the strip perform work on it while the larger or backup rolls, lend rigidity to the work rolls. After leaving stand No. 2 the strip passes over the periphery of the two rolls of the delivery tension device. Here the torque of the motor is transmitted to the strip only by means of surface friction between the strip and roll. The strip then is recoiled by the delivery reel.

Except for the small percentage of torque used to overcome machine losses and bearing friction in the rolls and reels, the combined torque, produced by the delivery reel motor, the delivery tension motor and the entry reel drag generator, is utilized for producing tension in the strip.

Tension Device Is Used

Principally because of uneven mechanical distribution of tension over the width of the coil as the reel builds up, it is not practical to produce all of the tension on the delivery reel alone. If the strip thickness differs minutely at the edges from that at the center of the strip, this difference builds up with each succeeding lap. At increase diameter, the tension becomes uneven. Therefore, the delivery tension device is used since this provides equal pull over the whole width and pulls always in a horizontal line. The delivery tension device, therefore, makes it possible to use a relatively light tension on the reel.

However, as Nos. 1 and 2 stands do work on the strip from roll pressure, the input of the motor to stand No. 2 goes into work done on the strip, and a portion of it may go into the tension between the stands. The input to the motor of stand No. 1 is equal to the work done on the strip only if there is zero tension between the stands and zero tension on the entry reel or

From a paper presented in Allis-Chalmers *Electrical Review*, September, 1940.

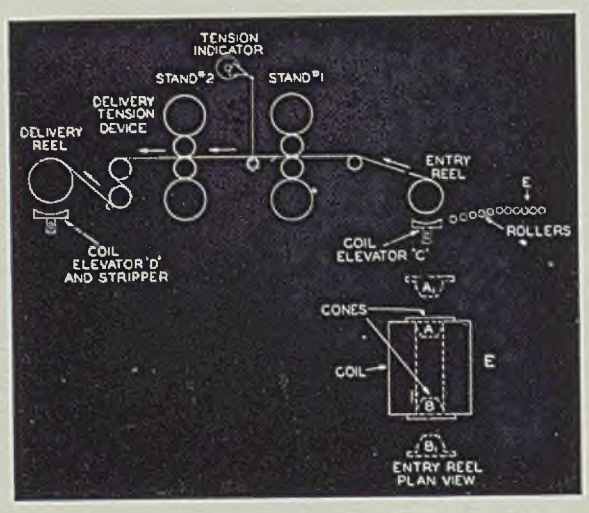


Fig. 1—Schematic diagram of tandem mill for tension rolling of strip steel

PRODUCTION BLOCKED BY A SLUG OF WATER

A Case Story

SOLVED WITH PREVENTIVE MAINTENANCE

TOMORROW—hundreds of plants may face a case like this: A midwestern manufacturer was suddenly swamped with orders. The plant had a good reserve capacity—yet, push as the management did, it failed to get the output needed.

The boilers and machinery were in excellent shape—but the steam lines were sluggish. The ailment was a common one—a condition that's quickly corrected with proper equipment.

That's how Preventive Maintenance entered the case. For, it's the only sure way of solving piping problems and keeping them solved. This simple technique guides you in installing and caring for pipe lines correctly; it helps you choose the right valves and fittings for every service.

This case shows how Preventive Maintenance works. While the management raved, the Superintendent put his hands on the trouble. The machines were not only slow in heating up, but they wouldn't stay hot. The drainage system was inefficient—it failed to remove condensate rapidly enough to keep the machines at maximum temperature.

The backlog of orders haunted the Superintendent. He saw that more than ordinary maintenance was necessary. "The Crane man," he said as he reached for a phone, "will help us solve this quickly and surely."

The two men reviewed the situation. To run the machines at top speed meant keeping them at maximum temperature. Condensate would have to be drained as rapidly as it formed. The correct solution, as Preventive Maintenance counseled, involved redesigning of the drainage system, and installing a Crane Inverted Float Trap on each machine.

Results: The condensate trouble was banished. Production was immediately doubled. Another user of piping knows the value of Preventive Maintenance. Also, knows that the best way to get most from piping maintenance dollars is to call in the Crane Man. Because, backed by Crane experience and the great Crane line of valves and fittings, he offers the means of a successful Preventive Maintenance program.

This case comes from the personal experience of W. F. C. —a Crane Representative in the Kansas City Branch

YOUR STEAM LINES KEPT HOT AND DRY WITH CRANE TRAPS

You are not getting the maximum heat and power from steam if your lines are not properly drained. You are straining the piping, shortening the life of valves, exposing steam-operated equipment to serious damage when condensate is not removed.

In steam lines up to 600 pounds pressure, the wasteful and damaging effects of condensate are completely eliminated with Crane Inverted Open Float Steam Traps. These sturdy, simple, and low-cost traps will pay for themselves many times over. Once installed they require minimum attention—yet, automatically, stop steam waste, step up efficiency.

For pressures up to 200 pounds, the Crane line of No. 981 traps will give maximum protection against condensate troubles.

1940 our 85th YEAR

CRANE

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

if these last two are equal in value.

The tension distribution throughout the mill is set by the operator, and the control is arranged to maintain constant tension at all operating speeds.

Energy required to accelerate the component rotating parts is stored in these parts on acceleration and must be dissipated on deceleration. Since the mill sections are mechanically connected through the steel strip, which is under tension, to hold accurate tension during these periods, the correct amount of torque must be added to each mill motor on acceleration and subtracted on deceleration; otherwise accelerating or decelerating torque must be supplied through the strip to the motors requiring more torque from those requiring less torque. Such change in tension is not permissible because of the resulting nonuniform production. Furthermore, this change normally would cause the strip to break or become "slack"—either of which would spoil the roll surfaces and would require regrinding, which is expensive, and would interfere with production.

The higher the mill speed and the faster the rate of acceleration, the more accurately these torque values must be controlled. Also, the more difficult becomes the problem.

In Fig. 2, the normal motor torques for driving the load at any speed are represented by T_1, T_2, T_3, etc. On the delivery reel, the torque is automatically changed by the control from T_1 to T_2, as the reel builds up. Likewise, it is changed from T_6 to T_7 on the entry reel proportionally as the coil diameter is reduced in unwinding. This control function is accomplished by holding the horsepower constant at any given mill speed but causing its value for various speeds to be reset automatically in direct proportion to the speed.

The relative magnitudes of inertia in a high-speed mill are represented by flywheels F_2, F_3, and F_4. These inertias can best be handled by reducing them to percentages of the full load motor torques required to accelerate them in a given time. IT_3, IT_4, and IT_5 represent the percentages of full load motor torques required to accelerate such a mill to full speed at a constant rate in eight seconds. The control is arranged to add these torques on acceleration and subtract suitable values on deceleration.

On the reels, however, the inertia depends on the amount of steel on them. Thus, on the delivery reel for a full width strip, the inertia is represented by the proportional size of flywheel F_1F for a coil of maximum diameter, while flywheel F_1E (dotted circles) gives the relative inertia for an empty reel. IT_2 represents the percentage of full load motor torque required for acceleration with a full coil and maximum strip width, while IT_1 gives this value for an empty reel. But inertia also depends on strip width. Fig. 3 shows inertia accelerating torques for various strip widths at various reel diameters. The strip width selector switch is set at the strip width being rolled, and the control is arranged to measure the reel diameter and give compensating torques as shown on the curves of Fig. 3. Like values apply to the entry reel.

All mill sections must be started at exactly the same instant. The various motors are required to develop sufficient torque to overcome static friction; and, since varying sizes of flywheels must be accelerated at the same rate without affecting the value of torque required at a steady state speed, variable voltage control is most suitable when the main mill motors are operated from the same generator. This type of control also lends itself admirably to the requirement of heavy torques at low speed. In fast accelerating mills, the torques during acceleration may approach the maximum available motor torques because of the requirements for overcoming inertia. Therefore, these considerations may determine the motor sizes to be used.

Specified temper in the steel and surface finish is produced by a combination of roll pressure and tension in the strip. The surface finish comes mainly from roll pressure. Therefore, the rolls of stands Nos. 1 and 2 are ground and polished to a smooth surface that imparts a high finish to the surface of the product.

As will be seen from Figs. 1 and 2, the normal load torques of the delivery reel and delivery tension

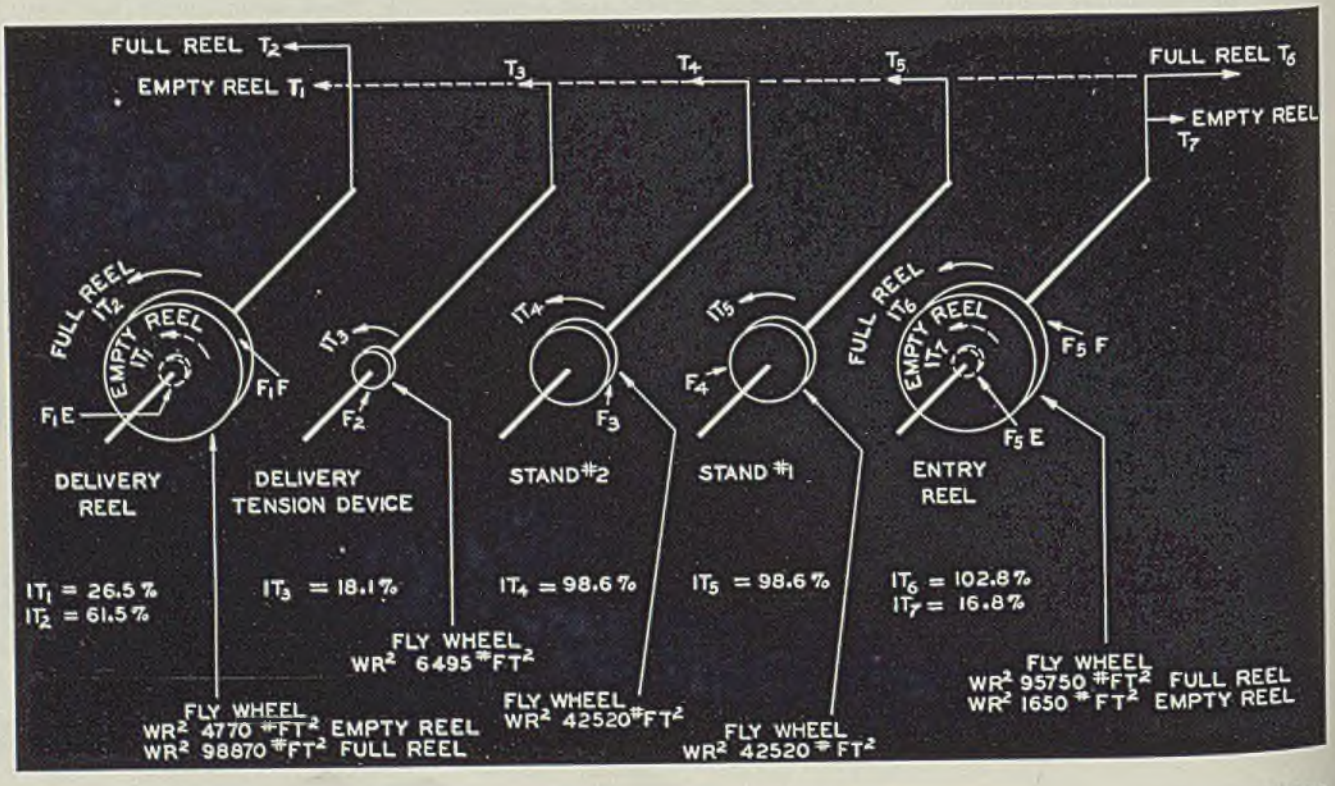
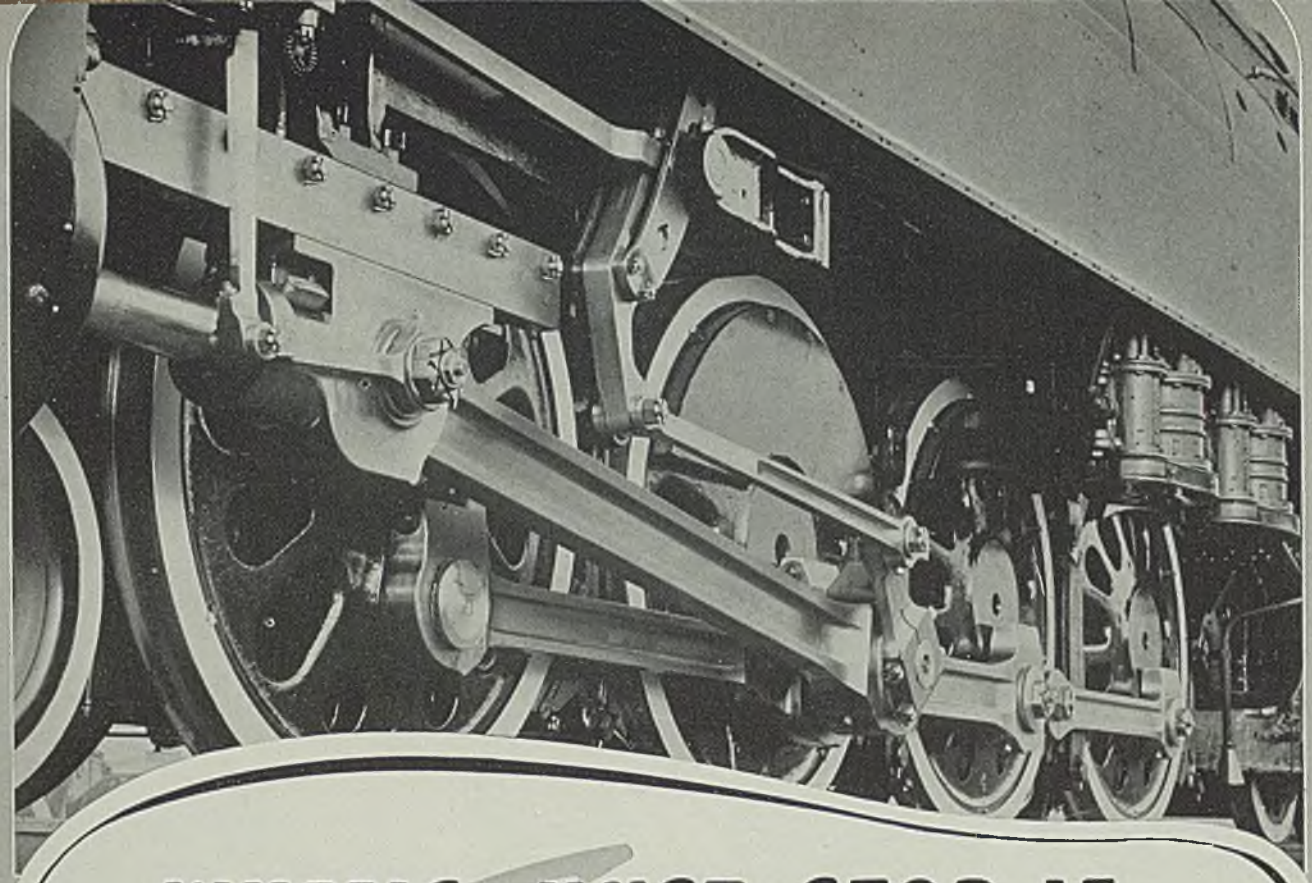


Fig. 2—Torques and inertias on a 2-high tandem mill served by reels, front and rear



WHEELS MUST STOP IF Steels — LIKE MEN - GROW TIRED -

● Overwork tires steels—causes fatigue—induces failures.

Larger sections to withstand the stresses do not invariably give the answer.

Today, weight and space limitations demand that smaller sections carry higher loads—safely—so the answer must be *alloy steels.*

Research into the behavior of steels subjected to repeated stress has taught steel users and makers that steels of the same tensile or hardness do not mean the same fatigue properties. Rather, the load-carrying ability of a steel depends upon the alloy constituents and the form of the structure at the time it is carrying the load.

This makes these attributes of Republic Alloy Steels worth your while to remember—

1. **They harden uniformly and easily.**
2. **They can be drawn back after quenching at a higher temperature for the same end point hardness.**
3. **The quench structure is more uniform than that of other steels.**
4. **The structure in the normalized and drawn state is more uniform.**

This table illustrates the importance of selecting the correct alloy, showing the fatigue limits on two steels treated to show the same tensile and hardness.

FATIGUE LIMITS—POUNDS PER SQUARE INCH

Steel and Treatment	On Polished Specimen	Specimen with notch 1/8" radius, 1/8" deep	Specimen with notch 1/16" radius, 1/16" deep
S. A. E. 1045 — normalized and tempered to tensile strength of 85,000 to 90,000	38,000	35,000	31,000
.25% carbon, 2.75% nickel steel—normalized and tempered to same tensile strength	52,000	47,000	41,000

From left to right in the table, the stress concentrations become increasingly severe and, under the worst conditions shown, the alloy steel has a fatigue limit higher than the un-notched and polished carbon steel specimens.

★ ★ ★

Since so many factors affect the "fatigue limit" of a part, the selection of the correct alloy steel and the details of its heat treatment is a matter in which the experience of the world's largest producer of alloy steels can help you. Write Republic Steel Corporation, Alloy Steel Div., Massillon, Ohio; General Offices, Cleveland, Ohio.

BERGER MANUFACTURING DIVISION • NILES STEEL PRODUCTS DIVISION
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REPUBLIC STEEL

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WORLD'S LARGEST PRODUCER OF ALLOY STEELS

Wheeling Steel's Yorkville Works — A Product of progressive Wean Engineering.

YOU'VE GOT TO PUT IT *ON*

• • • before *anybody* can take it *OFF!*

Judging by some of the dispatches we've read on conservation of essential imports, notably rubber and tin, garters will soon be a thing of the past and the scraping of tin from old food containers a national pastime. Seriously, however, a number of America's newest and largest tin stacks have been conserving this more than semi-precious metal ever since their new Kemp-fired equipment began production.

Take, for example, the new Tin House at the Yorkville Plant of the Wheeling Steel Company. These Yorkville tin stacks, planned, erected and equipped by the Wean Engineering Company, Inc., of Warren, Ohio, are the last word in efficiency. Here, too, Wean specified Kemp Immersion Melting for steady, high-speed production; for improved quality through the closest temperature control of tin and palm oil; for fuel economy that in previous installations has shown savings of 40 percent; and lastly, for phenomenal dross reduction that not only assures higher return on the investment but today is a significant step forward in conservation.

The details will interest you. Address **The C. M. Kemp Manufacturing Company, 405 East Oliver Street, Baltimore, Md.**

KEMP of BALTIMORE

motors and a portion of stand No. 2 motor torque, if not used completely to do work on the strip by roll pressure, add up to produce tension in the strip between the stands. This tension is balanced by the backward pull of the drag generators and that portion of the work done in stand No. 1 which is not supplied by its motor. For this reason, tension between the stands may be varied widely by variations in the energy delivered to or produced by the motor of stand No. 1. Where required, entry tension rolls similar to those in the delivery tension device shown in Fig. 1 are used between stand No. 1 and the entry reel to add to the "back pull."

As previously pointed out, the total torque delivered by the reel motors and tension device motors is used to produce tension in the strip when running at a given speed. Therefore, a measure of the motor input gives an accurate measure of the tension. On stands Nos. 1 and 2, however, the torque delivered is normally divided to go partly into tension and partly into work done on the strip by the rolls. The ratio between these components varies widely for different rolling conditions without definite relation to the value of the delivered motor torque.

Tension Indicator Provided

Therefore, as the tension between the stands cannot be effectively measured from the electrical values of the motor input, a tension indicator, as shown in Fig. 1, is used to measure and control the tension. This device deflects the strip upward a small distance by applying a vertical force to the idler roll, and this force is converted to electrical values, measured and calibrated to give the horizontal pull in the steel.

With this arrangement, roll pressure, total tension and tension distributions between the several mill sections are under the control of the operator; and the electrical control will hold such tension values constant at any desired setting.

This type of mill is not intended to reduce the steel in thickness but only to produce the desired Rockwell hardness, which is a measure of temper, and to give the desired surface. While acquiring these qualities, the steel undergoes a slight extension (approximately 1½ per cent) in stands Nos. 1 and 2 which is incidental. In thus treating the steel the tension must be high enough to exceed the elastic limit where necessary but not high enough to approach its ultimate strength, thereby making precision control imperative.

To start a temper mill, coils are deposited at E (Fig. 1) by a truck or conveyor. The entry reel usually is of the cone type, as shown at A and B, connected individually to drag generators on the same base and movable axially with the cones by motor-operated racks and pinions that shift the bases when desired.

The cones are separated to positions A_1 and B_1, by means of a control switch, which operates the motors that shift the cone bases. A coil then is rolled by gravity from E onto the hydraulic coil elevator, C, where it is raised or lowered by operating a switch, which controls the lifting cylinder, until the coil center opening is in line with the cones A and B. Then by operating the reel clamp switch, cones A and B are moved toward each other. Since they are slightly tapered they clamp the coil tightly onto their peripheries.

The elevator then is lowered to clear the coil since it is not further needed, and the coil can now be rotated in either direction by the drag generators acting as motors. A switch is used for running these motors at slow or "inch" speed with full torque available, and the leading strip end is fed into stand No. 1, which is rotated similarly in either direction. As the strip is being entered, both cones are moved simultaneously in an axial direction so that the coil is shifted and enters the end in the center of stand No. 1.

After the end of the coil has been entered in stand No. 1, full roll pressure is applied by means of push buttons, which operate the screwdown motors and turn the front mill screw and a similar one on the other end of the rolls to exert pressure on the roll bearings. These motors are clutched together, but to equalize this pressure, if necessary, push buttons are arranged to run one motor "up" while the other is run "down" for leveling. Where roll pressure has been applied, back tension is exerted from the drag generators and is read on an indicator and adjusted by operation of a rheostat.

Similarly, stand No. 2 is rotated slowly, and the strip entered by operating an inching switch; or both mills may be actuated from an inching switch. Tension between the stands can be adjusted by a rheostat and read on indicators. Push buttons are used to set the screwdown pressures. The delivery tension device is rotated slowly by an inching switch. The tension exerted by the tension device is adjustable from a rheostat and may be read on an indicator.

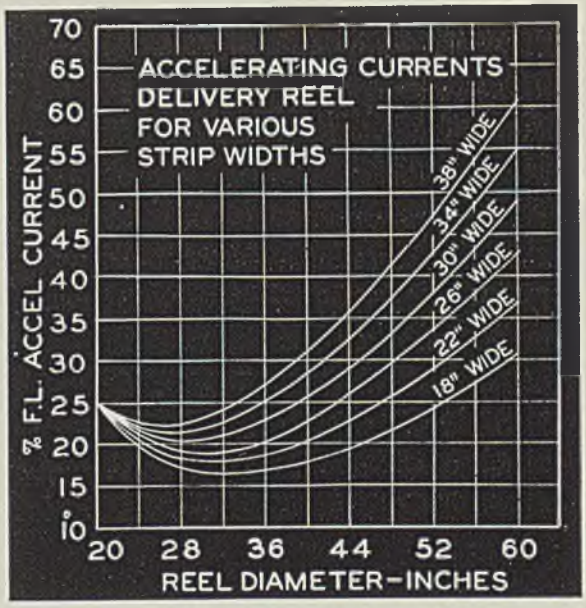

Fig. 3—Inertia accelerating torques for different steel diameters and widths of strip steel

Individual controls are also needed in setting or adjusting the mill, changing rolls, etc.; but normally all motors, except the delivery reel, are run slowly in the forward direction only to enter the strip from a switch so that the main operations are controlled through one switch.

The delivery reel is ordinarily of the collapsing type. In the collapsed state this reel has a "crack" in its periphery which, when the strip end reaches it, has previously been operated by the reel reset switch to the proper radial position to receive the strip. When the reel clamp switch is actuated, the reel is expanded and closes the "crank" to clamp the strip. The reel is then rotated slowly by means of the inch delivery switch to take out the "slack", and "stall" tension is applied from the reel motor through the medium of a stall tension push button. This tension is adjusted

(*Please turn to Page* 75)

Hard-Faced Dies . . .

Their Design and Fabrication

Precise hardness control, so essential in hard facing die parts, is obtained with only simple treatment. Metallic arc appears best weld method. Proper electrodes are now available for tool steel dies, hot-work dies, drawing and forming dies

Part II

By A. R. BUTLER
Welding Equipment & Supply Co.
2720 East Grand Boulevard
Detroit

■ *Oil-Hardening Types:* Fig. 4 shows hardness data for oil-hardening type of welds. Again in the as-welded condition, the atomic-hydrogen process shows a distinct drop in hardness at the weld due to the loss of carbon. The arc weld is normalized and shows there is little dilution, if any, of the weld metal in the base metal. The break in hardness at the weld shows a distinct, sharp curve upward instead of gradually sloping.

Hardness curves for the hardened pieces are similar to those in Fig. 3, Part I. The metallic arc weld is about the same hardness as the parent metal.

Again micrographs played an important part in correlating and checking the data. Oil-hardening rod as received was found to be spheroidized. As welded, the structure of the oil-hardening weld is coarse and has the appearance of a cast metal with a Widmanstatten structure. Upon heat treatment, however, this structure is displaced by a fairly fine-grained steel approaching the structure of the hardened base metal. An arc-welded deposit (normalized) shows a good even fine-grained structure of sorbite and the junction shows a good bond between the metals with little dilution. The base metal is spheroidized in the as-received condition. The arc weld when heat treated, however, produces even a finer grain of almost identical structure to the parent metal. Composition of the rod is such that the weld in the heat treated form is martensitic in structure. Carbide particles also are visibly dispersed throughout the structure.

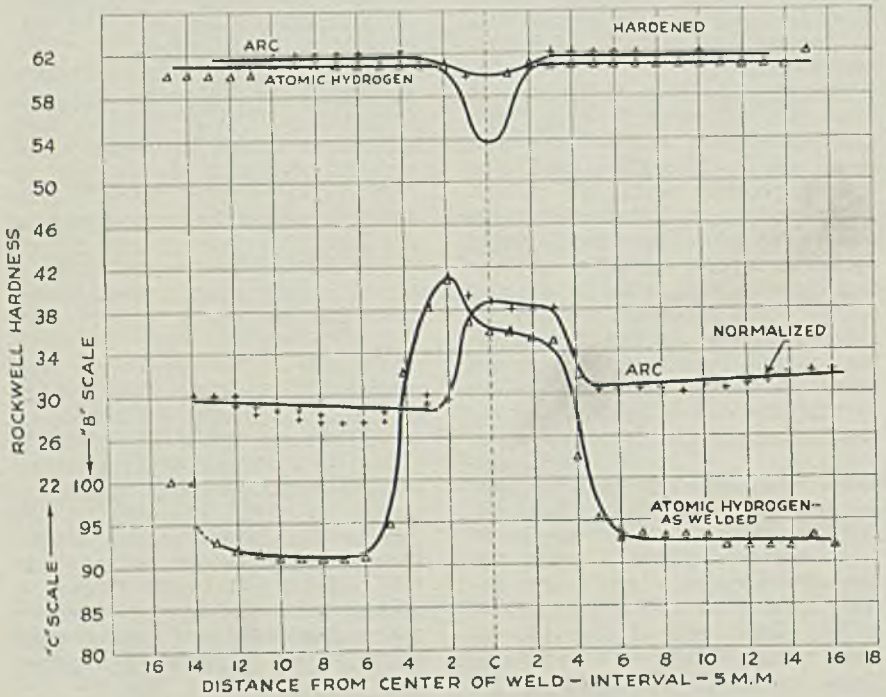

Fig. 4—Hardness of oil-hardening type welds and base metal at various distances each side of weld center. Note how curves differ for various weld processes and compare with Figs. 5 and 6, also Fig. 3, Part I

Air-Hardening Types: The hardness data for this type of deposit is shown in Fig. 5. Again there is a repetition of results only on a higher scale with regard to the as-welded condition. Atomic hydrogen weld again shows a pronounced decrease in hardness. Curves for the hardened steels show the deposit harder than the base metal, probably due to the chemical composition of the weld which is well in the cementitic region.

Micrograph studies of the air-hardening rod as received show a martensitic structure with carbides dispersed throughout. Both atomic-hydrogen and the metallic-arc welds as deposited show a coarse dendritic structure of the cementite and are columnar in nature. The junction, however, has evidence of

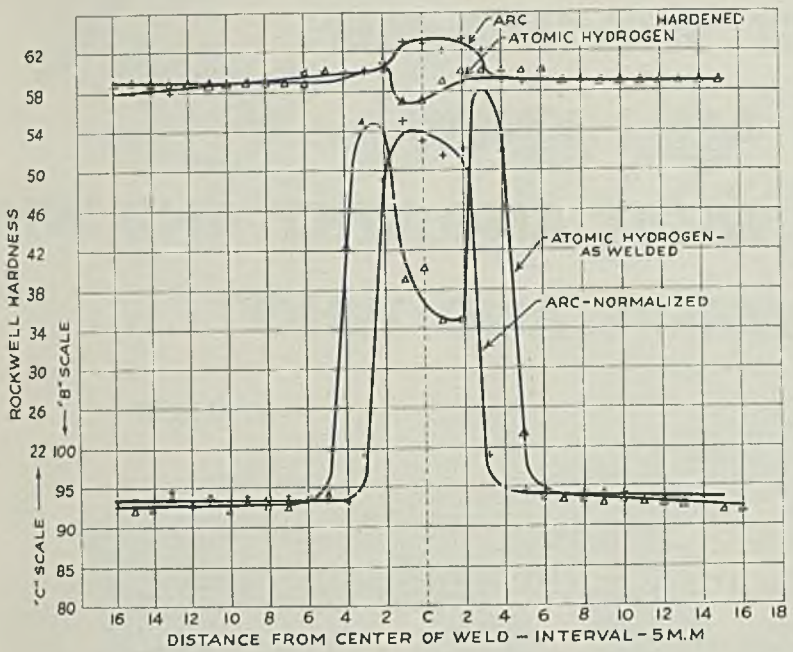

Fig. 5—Hardness curves for air-hardening type welds and base metal. Notice the difference between the metallic arc and atomic hydrogen welds

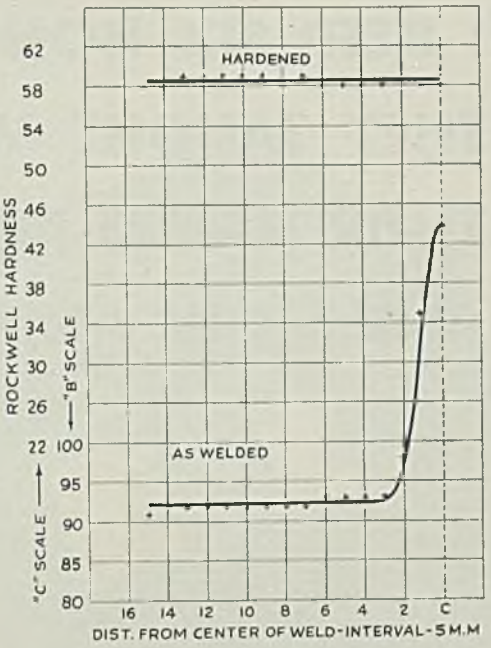

Fig. 6—Look at the uniformly increased hardness values obtained here by proper hardening treatment. These are for oil-hardening weld metal on an air-hardening base metal

having the grain structure refined and equi-axed. The base metal itself is spheroidized with other carbide particles dispersed through the area in streamer-like regularity. Hardening in each case refines the structure. Structure of atomic hydrogen weld is coarser than that of the metallic arc weld, due probably to the chromium content variation. Assuming that the chromium content of one of the welds is less than the other, they would each have different critical points because chromium tends to raise the critical transformation line. Therefore, when they are both quenched from the same temperature, one weld is higher above the critical than the other and, therefore, should have a slightly coarser structure, as was noted.

The air-hardened steel is martensitic with a large percentage of carbides visible.

Special Oil-Hardening Weld on Air-Hardening Steel: Hardness data is plotted in Fig. 4. The "as welded" condition is typical of the arc weld deposits with the hardest section in the center of the weld. The hardened sample, however, shows a distinctive feature in that it is of even hardness throughout.

A study of the microstructure shows that the center of the weld "as welded" is of fairly even grain size while the junction area is of the columnar structure. This may have been due to the high-chromium air-hardening steel base mixing with the oil-hardening rod and raising the critical range to such a degree that the heat from the overlay of weld did not affect it. Heat treatment does not refine the weld greatly, but it does change the structural components, probably due to interalloying action. The junction is particularly interesting in that martensitic structure is present (in a small amount) at the junction.

A micrograph at higher magnification of the as-welded oil-hardening deposit on air-hardening steel shows martensitic needle-like network throughout the dark patches. Troostite appears in the white portion.

General Discussion: From hardness readings and microstructures, the metallic arc-welded samples in all cases showed physical properties and structure very nearly like those of the parent metal. Atomic hydrogen welding approached that condition but fell behind in all fields. The gas welding of course was too limited to make any prediction. The fact that the arc weld appears so well, coupled with the fact that atomic hydrogen welding is more costly, makes metallic arc welding stand out even higher in this respect. Atomic hydrogen welding would probably suffice if a rod of higher carbon content were used. Another factor of importance is that alloying by means of a coating is possible in metallic arc welding and can improve the weld considerably.

A thorough study of the data for any particular application is now possible. Suppose that a blanking die requires a hard, wear-resistant surface together with a tough base or core. An alloy steel might solve the problem at a high cost. However, by welding it may be possible to construct the die of cheaper carbon steel and face it with an oil, air or water-hardening rod. The die can then be heat treated and drawn to specific requirements. In most cases, subsequent heat treatment is not necessary. However, if deposit is heat treated, the treatment should favor that recommended for the deposited metal and not the steel base. The result would naturally be a die with a hard surface and a tough shock-resistant base. Such applications permit cost of new dies to be reduced appreciably.

Conclusion: It may be concluded that the hard facing welds produced by metallic arc welding are the best type. The hardness and structure of this type of weld approach the properties and structure of a base metal of similar chemical composition. Atomic hydrogen gives fairly good results but in order to have a comparable structure, the carbon content of the rod should be increased by approximately one-third of the original carbon content.

Water, oil, and air-hardening tool steel metallic electrodes for the fabrication and repair of various types of tool steel dies are now procurable as also are electrodes for hot-work dies and alloy electrodes for drawing and forming dies.

Water-hardening electrodes of proper type will produce a deposit comparable to the best carbon-vanadium water-hardening steel and will take a typical water-hardening heat treatment. The self-hardening nature of the deposited metal gives an ultimate hardness of 58 to 60 rockwell on the C scale

**"I KEEP SIX HONEST SERVING MEN,
THEY TAUGHT ME ALL I KNEW.
THEIR NAMES ARE WHAT AND WHY AND WHEN
AND HOW AND WHERE AND WHO". . . .**

—KIPLING

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and it is not necessary to heat treat on repairs or new die construction if same lends itself to grinding.

Oil-hardening tool-steel electrodes correctly chosen will give a deposit having the properties of a typical nondeforming nonshrinkable steel. Characteristics of the deposit make it especially adaptable for effecting repairs to damaged or worn tools, regardless of the type of tool steel used in the original die. These electrodes are extremely versatile because of their nonshrinkable and nondeforming characteristics. An ultimate hardness 60 to 62 rockwell C is secured, depending somewhat on the type of underlying steel. Hardness developed from a deposit made with these electrodes as welded and after heat treatment will vary according to:

The admixture of the base metal and the deposit which will influence the hardness as welded and when heat treated.

Rate of cooling.

Pretreatment.

Technique employed.

In welding on machine or mild steel, two or more beads should be deposited to obtain the ultimate hardness. These electrodes are suitable for manufacturing dies with a mild or medium carbon steel as base metal. They can be used for repairing water-hardening steel, oil-hardening steel and air-hardening steel — including high-carbon high-chromium high-speed and similar steels.

Air-hardening tool-steel electrodes of proper design will give a typical air-hardening deposit with an ultimate hardness of 60 to 61 rockwell C. It is not necessary to heat treat on repairs or new die construction if the die lends itself to grinding.

Hot-work electrodes will give a self-hardening deposit with an ultimate hardness of 54 to 56 rockwell C by keeping the parent metal below the draw temperature of approximately 1000 degrees Fahr. It is not necessary to heat treat on repairs or new die construction if the die lends itself to grinding. The deposit is air hardening—hardens from a low temperature—does not scale excessively—withstands alternate heating and cooling without fire checking, and resists erosive action. These electrodes are used for all types of hot-work steels, such as those for die casting aluminum base alloys.

A special alloy electrode is recommended for all types of cast iron and medium hard steel drawing and forming dies. This electrode also is used on new drawing and forming dies to meet extraordinary wearing conditions that exist on sharp contours such as character lines, belt lines, sharp radii, and the like or where the average base metal does not stand up under these extraordinary conditions. They also are used on all sharp drawing contours which wear down due to frictional heat from drawing operations. The medium hard deposit from these electrodes will test between 240 and 260 brinell as welded and will work harden in use. The deposit is austenitic or nonmagnetic and does not pick up metal or residue that clings to ordinary draw or forming surfaces. The deposit also takes a high polish, which is of vital importance.

Procedure in welding all types of die steel is of utmost importance. The operator must have some basic knowledge of tool steel characteristics and heat treatment and should be informed as to the type of steel he is welding. The procedure and technique necessary as outlined by the manufacturer of a specific electrode must absolutely be adhered to and the operator should have all the necessary tools to do his work well.

While all welding should follow a specific routine, certain conditions may make it imperative that a short cut or minimum amount of time be employed in repairing certain tools to cut production delays. This is the period where areas adjacent to the actual weld area must be maintained as closely as possible to their original hardness.

Where more time is permissible in setup and procedure, the ultimate result that can be obtained by fabrication and repair should, by all means, be considered.

Requires Different Technique

Welding dies differs from usual work. Terrific abrasion and impact are encountered in small areas which call for exceptional qualities in the electrode deposit applied to these worn or damaged areas or areas subjected to these damaging conditions. That is why so much stress must be laid on preparation and technique. While it may seem complicated and tedious, it is really a case of applying a formula which becomes easy as familiarity is gained.

Below are listed general recommendations for the application of a metallic arc tool steel electrode on all types of tool steel.

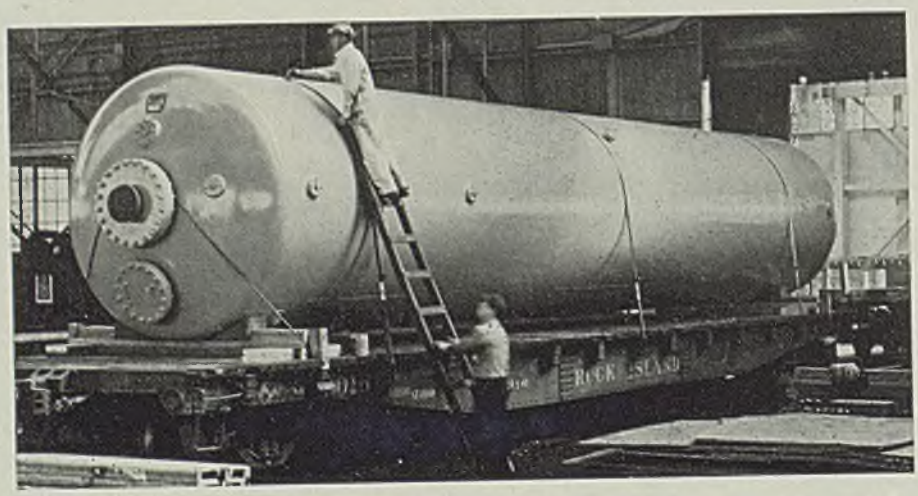
Application Recommendations: In welding any die steel precautions must be taken to *preheat* the base metal to just below the draw range of the particular type of base metal.

In welding cutting edges the electrode should be held favoring the top working face to allow the deposit to *flow* or *roll* over the cutting edge. To eliminate deep craters and the searing of sharp edges adjacent to the weld area when welding cutting edges, the arc should not be broken by pulling away the welding electrode rapidly. The arc should be pinched off, or the electrode lowered gradually to gain this effect.

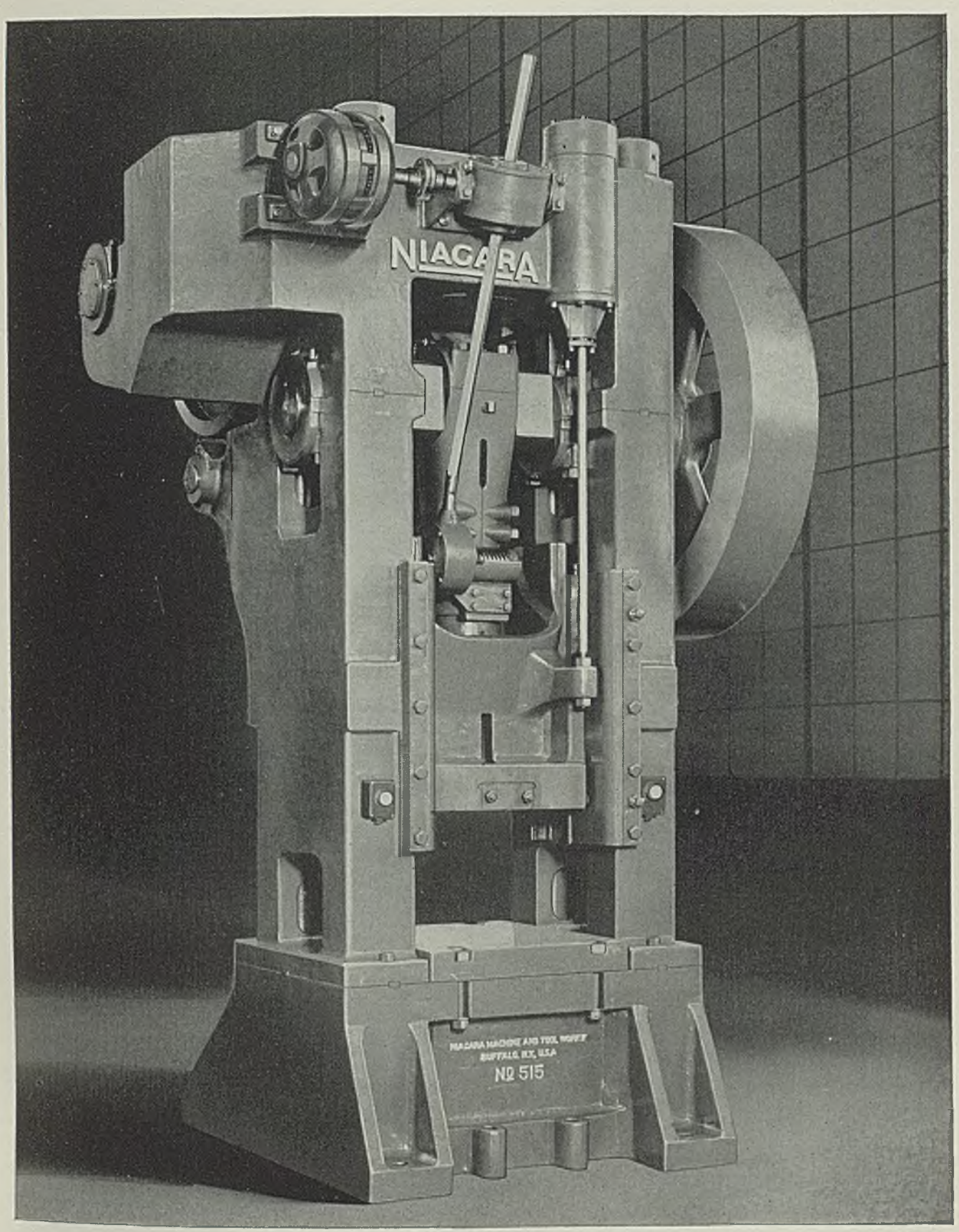
To eliminate craters and sear marks at extreme ends of the deposited metal when repairing parts of cutting edges, the welding bead should first progress in one direction to within a short distance of the other end of the worn or damaged edge. The weld bead then should progress in the opposite direction and overlap the first bead.

(*Concluded Next Week*)

Welds 45-Foot Pressure Vessel



■ **The accompanying illustration shows a 45-foot flange steel pressure vessel recently built by Chicago Bridge & Iron Co., 332 South Michigan avenue, Chicago, for the University of Iowa. Designed to house atom-smashing equipment and to withstand pressures of 125 pounds per square inch, this 8½-foot diameter unit is entirely of welded construction, all seams being butt welded and ground smooth on the inside to prevent unnecessary loss of electric potential**



Niagara Series 50 Single Crank Presses are widely used in the production of heavy stampings requiring a concentrated pressure.

Manufacturers are taking advantage of their versatility in performing many operations essential to modern production,—including punching, shearing, blanking, trimming, forging, bending, drawing and embossing. They are also suitable for broaching, reducing and redrawing when provided with long strokes.

Built in a complete range of sizes. Write for Bulletin 63-C. Niagara Machine & Tool Works, 637 Northland Ave., Buffalo, N. Y. Branches: Cleveland, Detroit, New York.

—Advt.

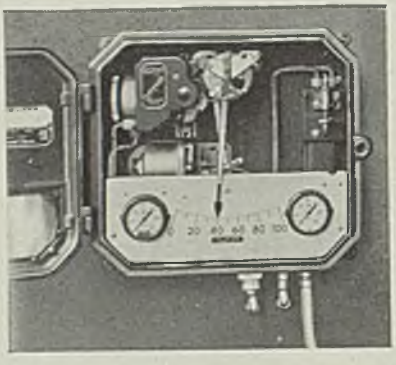
Speed Lathe

■ Schauer Machine Co., Cincinnati, has placed on the market a new high production speed lathe, featuring continuous motor operation. Both its collet and spindle are magnetically controlled and are engaged or disengaged by foot-treadle operation. Employed in the final finishing of

ball bearing races, headless set screws, gears, pinions, pulleys, spinning rings, screw machine products of all kinds, wire drawing dies and numerous other small parts, this lathe is credited with a substantial step-up in production. Special, built-in features are available to handle rods, tubes, and chuck stock or parts with the same degree of efficiency.

Transmission Systems

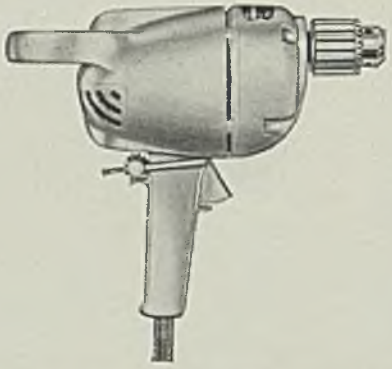
■ Taylor Instrument Cos., Rochester, N. Y., have placed on the market a remote pneumatic transmission system which correlates temperature, pressure, flow or liquid level data on a centralized panel or in a control room. It utilizes standard Taylor instruments and may consist of one or two transmitters connected to a receiver; or one or more receiving instruments, not necessarily near each other, and as far as 1000 feet from the transmitter. Transmitters or receivers may be indicating, recording or controlling types. Air pressure is the transmitting medium with ¼-inch outer diameter copper tubing as the means of connection. These systems are highly accurate—well within plus or minus 1 per cent of the scale range. The speed of response of the receiver to changes in output air pressure from the transmitter is largely dependent upon distance—the maximum lag being 1 second per hundred feet of connecting tubing. The hazards of electrical transmission are eliminated from these systems by doing away with electrical circuits in explosive atmospheres. For the operator out on the unit, one of these systems provides an indicating or recording instru-



ment for observation and eliminates the necessity of returning to the main control board to check the performance of the unit.

Power Drill

■ Skilsaw Inc., 5033 Elston avenue, Chicago, announces a new ½-inch model 80 drill for metal or wood. It weighs 8 pounds, is only 11½ inches long overall and 9¼ inches high. Its compact construction facilitates its



use in tight places. Every moving shaft is mounted on friction-free ball or needle-roller bearings. The drill has a no-load speed of 450 revolutions per minute and a full-load speed of 300 revolutions per minute. Its drilling capacity in steel is ½-inch and in hardwood 1¼ inches.

Lighting Unit

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed the Tufflite Concentrator, a unit using either a 300 or 500-watt PS-40 Mazda lamp for local floodlighting in railroad roundhouses, munition plants, electroplating plants, breweries, and around soaking pits, pickling vats and impregnating tanks. It consists of a copper housing, inner Alzak aluminum reflector, cast bronze socket housing assembly, swivel for ¾-inch conduit mounting, and a glass cover door assembly.

All hardware is bronze or copper, nickel plated. The heat-resisting glass spread lens is held securely in place against a graphitized asbestos gasket by eight bronze spring clips fastened with machine screws.

Broaching Machine

■ American Broach & Machine Co., Ann Arbor, Mich., announces improvements on its 3-way T-24 broaching machine for push broaching, pull broaching and surface broaching. It may now be supplied with a retrieving mechanism which is hydraulically operated for handling the broach, thus permitting the operator to have both hands free for manipulation of the machine. The retrieving mechanism is

mounted above the column of the machine, having its own slide and hydraulic cylinder, hydraulically controlled and timed, so as to operate in proper relation to the main operating cylinder. The illustration shows a close-up of the fixture. The machine is built in several tonnages, of which are the 4, 6 and 8-ton with 24-inch stroke. Larger sizes are now being developed. These will be offered to the trade shortly.

Die Casting Machine

■ Madison-Kipp Corp., Madison, Wis., announces a new die casting machine for zinc alloy. It is known as the Giant Kipp-caster model No. 500 and is about twice as large as the Standard. Its weight is more than four times that of the standard to provide the added strength needed for handling larger parts. The machine utilizes a combination of hydraulics and air. The die head ram is operated hydraulically through a special toggle arrangement. This is actuated by a hydraulic cylinder. The hydraulic system is the Vickers combination pump mounted on a 1½-horsepower, 1200-revolutions per minute motor. The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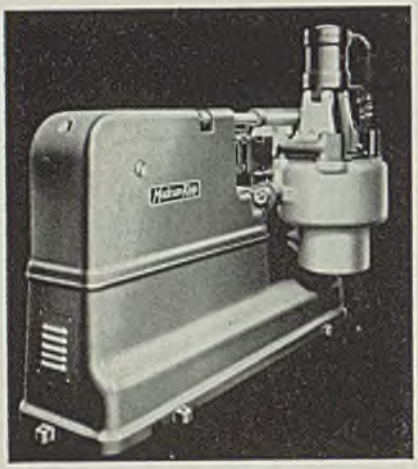
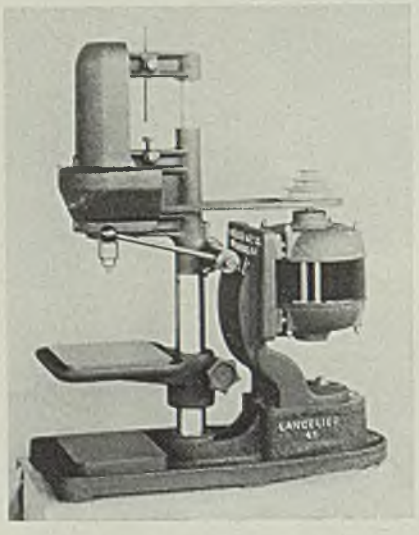
die head is 8 x 10 inches, but clearance is provided so that larger dies can be applied. Both the stationary and the movable dies may be of



two standard thicknesses either 3 or 4 inches. The stroke of the machine is 8½ inches. The gooseneck with plunger has a capacity for shooting a 3½-pound casting in zinc alloy—the pot capacity in zinc is 200 pounds. The length of the machine is 8 feet 1 inch, its width is 3 feet 8 inches. Main castings of this unit are of Meehanite A. The power parts are of heavy cast steel.

Ball-Bearing Drill

■ Langelier Mfg. Co., Providence, R. I., has introduced a No. 41 ball bearing drill which features a spindle mounting that eliminates belt pull. It has large sealed bearings that require no additional lubrication. These are used on the sleeve carrying the driving pulley and also

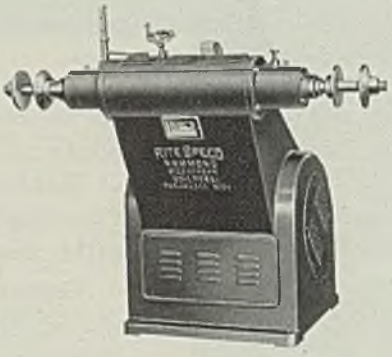


on the spindle end to take the drill thrust. The feed lever may be adjusted to several different positions, and the operating rack and pinion is protected by a guard.

For drilling to a fixed depth, a coarse setting is made, using a stop rod; then the final micrometer adjustment is obtained with a depth stop screw which has a fine thread and is checked in position. The drill's motor bracket is adjustable to produce the proper belt tension. The table and base are equipped with rims to retain oil and chips. Motors, complete with switch, cord and plug, as well as ¼-inch capacity chuck, are supplied as standard equipment.

Polishing Lathe

■ Hammond Machinery Builders Inc., 1611 Douglas avenue, Kalamazoo, Mich., have introduced a new VRO variable speed polishing and buffing lathe. It has an overhanging spindle, the front section overhanging 12½ inches from the lower front of the base, and is especially desirable on large bulky pieces.



Speed change of 1500 to 3000 revolutions per minute can be obtained by merely turning the hand wheel. This is accessible from the front of the machine. The indicator at the side of the hand wheel indicates the speed at which the lathe is running.

Portable Compressor

■ Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, has placed on the market a new CP 500 cubic foot diesel-driven portable compressor. It is furnished with all the latest features and is powered by a Caterpillar diesel engine. The compressor is designed as a V-8 having two low and two high pressure cylinders located on each side with an included angle of 90 degrees. One low and one high pressure connecting rod operate on each of the four crank pins. The unit features simplate valves, inlet-valve unloading, pressure lubrication, multiple-disk clutch and sectional intercooler. The engine speed varies automatically in direct proportion to the demand for air, between 50 per cent and 100 per cent of the compressor output. When the demand for air falls below half-capacity, the compressor is unloaded by holding open the inlet valves, while the engine continues to run at half-speed. When the air consumption increases, the compressor reloads at half-speed and then continues to operate at a speed required to meet the de-

mand. The engine is a 6-cylinder unit running at 1000 revolutions per minute. The compressor is available mounted on steel or pneumatic tires or as a skid mounted unit.

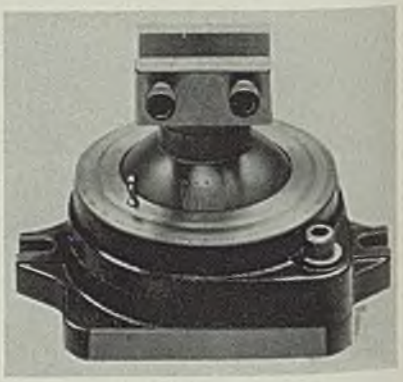
Wheel-Mounted Crane

■ General Excavator Co., Marion, O., has introduced a wheel mounted Supercrane for handling heavy materials. It features one operator, one cab, one engine and one set of controls. Travel speeds, four forward and four reverse, range up to 10 miles per hour and faster. The crane is rated at 15 tons capacity. It has load ratings of 5000 pounds at 50 feet radius in full circle operation. The machine may be used as a crane, clamshell, dragline, pull-shovel, and piledriver.

An outstanding feature of this crane is the wheel mount. It has 6-inch rear axles supported by 20-inch I-beams and 20-inch cross channels, the reinforcing plates being bolted and welded. The whole mount is supported by dual rubber tires.

Ball-Joint Vise

■ Engineering Service Inc., 6308 Pacific boulevard, Los Angeles, announces a Strickland ball-joint vise



recommended for chip breakers, curlers, rake angles, etc., on both carbide and other cutting tools. Its construction provides quick and accurate settings. Settings are obtained by matching the ball joint vertical degree graduation with the horizontal degree graduation re-

quired. The vise is 5 inches high and 5¼ inches wide.

Battery Booster

■ General Electric Co., Bridgeport, Conn., announces a new portable Tungar emergency booster, which will charge one 6-volt battery at 40 amperes, or two 6-volt batteries or one 12-volt battery at 2 amperes each. It charges an average battery in ½ to 2 hours, depending on its charged and physical condition. The booster can be plugged into any standard outlet of proper rating.

A time dial will cut the booster off automatically. The latter is equipped with long alternating and direct-current leads and two 99 x 45 Tungar bulbs. The ammeter indicates whether or not a battery is shorted or reversed, and has two charging zones for 20 and 40-ampere charging. Heavy clips provide tight connection between battery and booster. A convenient carrying handle enables the booster to be moved to any desired location. It is 24½ inches high, 13¾ inches wide, 10⅜ inches deep and weighs 84 pounds. Two ratings are available, either 110 or 220-volt.

Fixture Switch

■ McGill Mfg. Co., Valparaiso, Ind., announces a new fixture switch which embodies an arrangement for attaching wire leads to terminals. It is compact, strong and has a smooth, easy pull. It fits wall

thicknesses up to 5/16-inch and has 9-inch wire leads, stripped ¾-inch. Its overall dimensions are ⅝ x ⅞-inch. It is rated at 3 amperes, 125 volts and 1 ampere, 250 volts.

Air Compressor

■ DeVilbiss Co., Toledo, O., announces a portable type NKB air compressor for operating small, spray painting equipment. Rated at ½-horsepower, it is quiet in operation and weighs approximately 72 pounds.

It is equipped with four rubber-tired swivel casters. Actual delivery is 4.55 cubic feet per minute at 45 pounds pressure. It holds the medium spray guns at from 32 to 40 pounds, while maximum pressure is 50 pounds.

Liquid Flux, Dispenser

■ The Linde Air Products Co., unit of Union Carbide and Carbon Corp., 30 East Forty-second street, New York, announces a new liquid flux and its dispenser for use in bronze welding ferrous and nonferrous materials.

This new fluxing agent called Oxweld Brazo Vapor flux is of greatest value on production work where the bronze-welding operation is continuous, the metal sections being joined are relatively light and the joint is sufficiently exposed.

The flux must be used in conjunction with a special dispenser known as the Oxweld L-13 Vapor Flux dispenser. It is of the bubble type and provides a means for bubbling acetylene used through the liquid flux so that the flux in vapor form is picked up by the acetylene and carried through the hose and blowpipe to the point of welding.

Since application of the flux is automatically and mechanically controlled, only the required amount is deposited where it is needed.

Bolts and Nuts

(*Concluded from Page 55*)

Inspection takes place during the operations and also before the product is packed. Fig. 2, as shown, is one of the inspection methods which help assure a product of highest quality.

In the packing department, all transferring from shop boxes to kegs or cases including dumping, weighing, stenciling and nailing is done on roller conveyors, see Figs. 3 and 4. After packing, the materials are conveyed by a gravity roller conveyor to the shipping department on the floor below. The boxed and kegged material then is taken to railroad cars on the company's siding. In cases where it is necessary to take the materials to railroad freight depots the packed material is conveyed in trailer trucks pulled by a tractor. Of course, a certain amount of packed material goes into stock in which case it is moved on 2-wheel hand trucks.

♦

Use of Castor Oil in Paint Industry Widens

■ Castor oil is now being adopted in increased quantities by the paint industry to replace drying oils supplied by countries now at war or embargoed, according to Dr. John C. Weaver, Sherwin-Williams Co., 101 Prospect avenue, Cleveland. He points out that present indications are that the 1940 use of castor oil will be twice as much as 1939. A new process of dehydration, he states, makes an excellent drying oil from the castor bean. Most farm-grown oils such as oiticia, perilla, and tung are either slow in development or are not suited to the climatic conditions of United States, whereas new castor plantings can produce a good crop of beans in a single year.

Clear coatings and enamels for refrigerators, cabinets, collapsible tubes and many household products are now being made with castor oil. The castor oil enamels dry faster than perilla or oiticia enamels and have a far greater color retention and elasticity.

Philip Carey Improves Its Asphalt Tile

■ Philip Carey Mfg. Co., Lockland, Cincinnati, O., announces an improved asphalt tile which possesses specific advantages for use both as an industrial flooring and for protection of roof areas which are used for recreational or other purposes. Called Elastite asphalt tile, it is a compound of asphalt and mineral filler, reinforced with asbestos fibers, densely compressed and die cut to size.

It is available in standard black and standard red, in ⅛-inch thickness and in sizes 12 x 12 inches and 12 x 24 inches. The product is extremely dense, tough, highly resistant to compressive loads, dustless and quiet under wheel traffic. While hard, it is not rigid or unyielding. It may be applied to any properly prepared sub-base and is ready for use as soon as laid. It also is highly resistant to fire.

Its breakdown voltage of over 30,000 volts indicates an electric insulating value approximately equal to that of marble. In addition it is vermin and rot-proof and practically nonabsorbent in the presence of water.

Reader Comments

(*Concluded from Page 4*)

tected through local decentralization of plant units.

Geographically, plant units of war industries such as munitions, chemicals, airplanes, should be located as far from congested districts as possible. While life is as dear to suburbanite as to city dweller, fewer civilians would be endangered in an attack on a plant in a town of 25,000 than if the plant were in a city surrounded by tier upon tier of teeming, multi-story apartments. Ample evidence of this is shown daily in newspaper pictures portraying bombed city areas and huge casualty lists.

While trained workers are not as abundant in small cities as in metropolitan centers, they are in many cases more stable than city workers, who can easily change from one company to numerous others with little effort. Important to war industries, there is less chance for Fifth Column activities in small towns where everyone knows everyone else.

In geographically decentralizing plant units to manufacture for national defense, the same basic economic rules should be applied as for normal manufacture. The business man is still interested in profits. Transportation, including trucking, railroads, navigable waterways, roads, is particularly important in the case of firms producing defense materials. Psychological effect of dampness, cold or high humidity upon workers, as well as physical effect upon sensitive defensive products, must be considered. Moving south may do away with heating costs. But what about cooling costs in some industries?

With today's changing concept of warfare, what was profitable decentralization yesterday may not be so today. Military objectives have expanded to include practically all manufacturing sources whether located in the hinterland or deep within the country. Small plants locally and geographically decentralized are harder to bomb than their huge counterparts visible to enemy planes above anti-aircraft range.

ALAN H. GILLMORE

President,
Gillmore-Carmichael-Olson Co.,
Cleveland.

<< HELPFUL LITERATURE >>

1. Conveyor Screw

Lee Spring Co.—6-page illustrated folder, "Why Don't You Keep It Moving," presents features of the "Lee" conveyor screw, which is available in many sizes and designs and may be welded to any shaft. Features include lightness of weight, low cost, strength, adaptability and easy machining.

2. Drilling Machines

National Automatic Tool Co.—40-page illustrated bulletin No. 100, "Drilling, Boring and Tapping in the Aviation Industry," not only describes drilling, boring and tapping equipment, but shows by pictures and blueprints details of work performed. Each page is a case study of a particular operation.

3. Industrial Trucks

Ohio Galvanizing & Manufacturing Co.—4-page illustrated bulletin No. 232 covers freight and warehouse trailers and factory trucks. Various designs in capacities ranging from 2 to 10 tons are shown, as are rack cars which are made to specification.

4. Grinders & Motors

Sawyer Electrical Manufacturing Co.—16-page illustrated catalog No. A-39 is descriptive of the "Hi-Power" line of grinders, sanders, buffers, motors, rotors, stators, and accessories. Complete specifications and features are given on all equipment.

5. Lathes

South Bend Lathe Works—12-page illustrated catalog No. 16-T describes the new 16-inch swing series "S" "South Bend" precision lathe, which is back geared and uses belt drive to spindle. Full specifications of lathe and details of attachments, accessories, and tools are included.

6. Die Steel

Jessop Steel Co.—4-page illustrated bulletin is descriptive of "Windsor Special" air hardening die steel. Included are approximate analysis, hardening and tempering range, thermal expansion, magnetic properties, electrical resistance, specific heat, main absorption point, specific gravity, and hardness values.

7. Needle Bearings

Torrington Co.—32-page illustrated, spiral-bound catalog No. 24 deals with needle bearings and their application. Complete specifications are given on all types of bearings. Application data includes automotive, aircraft, power transmission, machine tool, textile, agricultural, conveying and elevating, and miscellaneous equipment.

8. Metal Cleaning

Cowles Detergent Co.—4-page publication, "Metal Cleaning Tips" is issued monthly. Current October issue is entitled "The Cleaning of Steel." Qualifications of an efficient steel cleaner, cleaning in steel mills, cleaning before electroplating, painting, enameling and lacquering and miscellaneous cleaning are covered.

9. Industrial Batteries

Gould Storage Battery Corp.—18-page illustrated loose-leaf bulletin No. 100 is entitled, "Gould Kathanode Glassklad Batteries for Industrial Trucks and Tractors." Complete data on design, application, construction and capacities are given.

10. Unit Heaters

Young Radiator Co.—4-page illustrated catalog No. 2540 is descriptive of "Vertiflow" unit heaters, designed for use in buildings which have high ceilings and are difficult to heat with ordinary types of equipment. Applications and capacities are given.

11. Bearing Metals

A. W. Cadman Manufacturing Co.—12-page illustrated engineering bulletin No. M-1 covers requirements of bearing metal, properties of "Cadman" metals, uses, and other helpful data. Microphotographs show bearing structure.

12. Alloy Castings

Electro Alloys Co.—16-page illustrated bulletin, "X-Ray Inspected Castings," presents grades and application, physical properties, micrographs and fractures, inspection practice and typical products manufactured of "Thermalloy" castings for heat and corrosion resistance.

13. Turret Lathe Tools

Warner & Swasey Co.—180-page illustrated spiral-bound catalog and manual No. 38 includes ordering instructions, selection and engineering data and complete description of chucking tools, bar tools, cross slide tools, holding devices, semi standard and special tools.

14. Vertical Motors

General Electric Co.—Two 4-page illustrated bulletins Nos. GEA-1368D and GEA-1412B deal with induction motors. The first gives complete specifications on vertical hollow-shaft, shielded dripproof construction units, and the second is devoted to features of solid-shaft motors in open, shielded, and totally enclosed fan-cooled designs.

15. Washers

Wrought Washer Manufacturing Co.—Illustrated stock list No. 55-D lists thousands of washer specifications in various materials, including steel, brass, copper, aluminum and fiber which are available from stock.

16. Speed Reducer

W. A. Jones Foundry & Machine Co.—16-page illustrated bulletin No. 55 describes various types of spur gear speed reducers. Included are tables giving horsepower ratings, motor speeds and ratios. Dimensions and complete specifications are given for each design.

17. Paste Solder

Wayne Chemical Products Co.—6-page illustrated folder, "A New Soldering Process," explains how "Meltomatic" paste solder reduces soldering time in most applications. Instructions for use of product and typical experiences are included.

18. Metal Finishing

Cincinnati Grinders Inc.—4-page illustrated bulletin No. G-455 presents a factual article on "The Use of Abrasives for Removing and Finishing Metals." Results from application of grinding in all types of industries are related.

19. Friction Clutches

Carlyle Johnson Machine Co.—10-page illustrated "Clutch" catalog contains revised data covering the "Johnson Standard" type as well as the "Super-Johnson" type expanding ring friction clutch, a compact design for light powered drives.

20. Sand Conditioning

American Foundry Equipment Co.—16-page illustrated "Sand Conditioning" bulletin contains a non-technical discussion of sand conditioning by "Sandcutter" method. Also presented are descriptions of four "Sandcutters" used in foundries of all sizes and types.

21. Industrial Pumps

American Manganese Steel Div., American Brake Shoe & Foundry Co.—24-page illustrated catalog No. 940 contains complete data on line of pumps for industrial application. Bulletin is written for engineering, operating and purchasing men.

22. Oil Circuit Breakers

Allis-Chalmers Manufacturing Co.—Two 4-page illustrated bulletins Nos. B-6003 and B-6093 on quick clearing, frame mounted, high voltage oil circuit breakers for outdoor service. First is descriptive of large units in ratings from 15 to 69 kilovolts, and second on small units in ratings from 15 to 23 kilovolts.

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<<< HELPFUL LITERATURE

(Continued)

23. Fluorescent Lighting

Hygrade Sylvania Corp., Miralume Div.—24-page illustrated bulletin No. M-143 describes and lists available models in "Miralume" line. Complete story of these fluorescent lighting units for all types of industrial and commercial lighting applications is told. Table gives recommended minimum standards of illumination.

24. Bearing Material

K. W. Atwater—4-page illustrated bulletin, "Lignalloy," gives complete specifications on this non-metallic bearing material, which is adaptable for heavy machinery, such as rolling mills. Material is stated as having very low coefficient of friction.

25. Electrical Materials

Allegheny Ludlum Steel Corp.—20-page illustrated blue sheet No. B202 covers such electrical materials as electrical sheets, coiled electrical sheets, relay steels, laminations, and various "Allegheny" products. Application data, physical and electrical properties are presented in detail.

26. Transmission Belts

Hewitt Rubber Corp.—6-page illustrated folder, "Cut your Power Costs", presents horsepower table, standard price list, and other useful information on "Monarch" straight edge transmission belts which are said to reduce power loss and prevent slipping.

27. Hardening Baths

A. F. Holden Co.—8-page illustrated bulletin, "A New Development", is descriptive of "Holden" high speed hardening baths, a method in which a ceramic pot performs an important function. With this system molybdenum steels can be hardened successfully, it is claimed.

28. Fastenings

Tinnerman Products, Inc.—16-page illustrated catalog No. 135 shows and explains 61 different spring tension "Speed Nut" applications in assembly of automobiles, radios, stoves, refrigerators, heaters, trucks, business machines, electrical apparatus and aircraft.

29. Oil Cushion Bronze

Boston Gear Works, Inc.—4-page illustrated bulletin No. A-40 gives complete sizes and prices of "Oilite" cushion bronze bar stock in cored, solid and plate form. This material is suitable for machining for all types of oil-less bearing applications.

30. Rack Coating

United Chromium, Inc.—4-page bulletin No. 1511 presents details on "Unichrome" rack coating-W, which is not affected by plating solutions. Advantages of this protective coating and testimonials of users also are included.

31. Roller Chain

Morse Chain Co.—92-page illustrated bulletin No. R-40 is a comprehensive catalog, engineering data book and price list on "Morse" roller chain. Construction of channel lubricated, interchangeable roller chain, details of adaptations and applications, selection and performance data are given. Specifications and recommendations on sprockets are included.

32. Cold Finished Bar

Joseph T. Ryerson & Son, Inc.—8-page illustrated bulletin, "Cold Finished Bars," gives complete description of wide range of bars available from stock. Chemical analyses, working properties, suggested applications and other data are included.

33. Nickel Alloy Steels

International Nickel Co.—40-page illustrated "Nickel Alloy Steels" section IV, data sheet No. 1 covers iron-nickel and related alloys of the "Invar" and "Elinvar" types. Physical properties, applications, and other engineering data are given on these alloys.

34. A. C. Welder

Westinghouse Electric & Manufacturing Co.—4-page illustrated catalog section 26-325 is descriptive of the type WT-4 alternating current welder, designed for general utility service and production welding. Features, accessories, electrical specifications and other data are given.

35. Bronze

Koppers Co., Bartlett Hayward Div.—Illustrated data sheet No. BB-1 describes and discusses engineering applications of "D-H-S" bronze. Recommended uses are listed and tables give minimum physical properties for "D-H-S" bronze No. 1, 2, 3 and 4.

36. Conveyor Equipment

Saginaw Stamping & Tool Co.—50-page illustrated catalog No. 140 includes details of complete line of overhead materials handling equipment. Full specifications and application data are given on line of wheels and trolleys for all types of overhead conveyor installations.

37. Production Tools

Illinois Tool Works—292-page illustrated catalog E. In addition to serving as a catalog of products, this book is a ready reference handbook of useful engineering data on metal cutting tools. Complete information is included on such tools as hobs, shaper, gear and milling cutters, miscellaneous tools, broaches, involute splines and machines, as well as "Shakeproof" fastenings, washers and stampings.

38. Stainless Steel

Republic Steel Corp.—20-page illustrated bulletin No. ADV 373 "The Welding of Republic Enduro Stainless Steel," contains data on welding of stainless steel by various commercial methods, including electric arc, atomic hydrogen, flash, projection, seam, spot, and gas. Brazing and silver soldering, as well as proper design of welded joints are treated.

39. Temperature Regulators

Sarco Company, Inc.—16-page illustrated catalog No. 52 covers self-operated temperature regulators for controlling flow of steam, gas, water or brine. Tables give capacities of different valve styles to meet control problems in connection with industrial process work, water heating, air conditioning and refrigeration.

40. Hydraulic Press

Colonial Broach Co.—6-page illustrated bulletin No. VBS-40 covers new line of "Senior" presses, which range in capacity from 1 to 10 tons and with stroke from 18 to 42 inches. These units are completely hydraulic in operation and designed for general purpose use, including assembly, straightening, and broaching work.

41. Tools and Blanks

McKenna Metals Co.—6-page illustrated bulletin No. 740 tells how "Kennametal" is manufactured and where it is used for machining steel up to 560 brinell hardness. Tables describe comparative physical properties, materials machined and recommended cutting speeds.

42. Metal Cutting Saws

Peerless Machine Co.—8-page illustrated catalog No. 51 describes and illustrates full line of "Peerless Universal" metal cutting saws. Phantom drawings show design and operating principle. Tables of cutting speeds are also given.

43. Speed Reducers

Link-Belt Co. — 40-page illustrated catalog No. 1524 is descriptive of worm gear reducers of all types. Specifications, horsepower ratings, engineering data, and selection guidance are given. Included is 8-page illustrated price list.

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Cold Rolled Strip Steel

(*Concluded from Page* 61)

from a rheostat and is read on an indicator.

With both front and back tension on the strip, the mill is accelerated to any speed and decelerated by throwing the main mill master switch, to the proper position. At this point, the whole mill is under the control of the operator at the delivery end, called the "roller"; and, through a series of meters he has an indication of all the necessary mill conditions.

At the end of the coil, the assistant "roller" at the back or entry end presses the slow down push button to decelerate the mill.

To remove the coil from the delivery reel, the coil hoist is raised to take the weight off the coil when it is collapsed by the operation of the reel clamp switch. Then it is moved off the reel axially by pressing the stripper switch and the cycle is repeated for the next coil.

If it becomes necessary to stop the mill quickly, push buttons are conveniently located to apply dynamic braking to bring the mill to a stop in the shortest possible time. To prevent possible injury to the operators working on the mill, the main motors can be cut out of service by means of three push buttons.

As these many various operations have been found necessary and desirable under mill rolling conditions, individual motors on component mill sections and auxiliaries are most essential.

In order to hold the operating personnel to a minimum and to have operators free for maintaining quality and maximum quantity of production, precise control must be had of all machines under every condition of speed, required tension, coil size, etc.

♦

Nondestructive Test

(*Concluded from Page* 40)

illustrations for details of typical defects readily detectable on this machine.

Other details of the machine include a base designed for handling the entire equipment as a unit. Overall dimensions are approximately 9½ feet long, 4½ feet wide, 6 feet high. Tube travel position is chosen for minimum effort by the operator when manual loading is required. Connected electric load depends on type of drive motor but does not exceed 7½ horsepower.

Tube materials which can be tested include electric-welded mild steel tubing, seamless steel tubing, as well as tubes of many other materials. While present equipment tests tube of a maximum diameter of 2½ inches, there appears to be no upper diameter limit for this method of testing.

Tiny Device Tames Shower Curtains

■ In order to make your shower curtain behave, Artcraft Waterproof Products Co., 64 West Twenty-third street, New York, has brought out a tiny device called the Hold-Rite magnetic attachment. It is designed to keep a shower curtain tight against the side of the tub, no matter how wet it may get or what breeze may come along.

The device consists of a small Alnico rustproofed magnet with an attached clip. The magnet is clipped to the curtain's bottom and placed against the side of the tub. It will cling to the ferrous material of which the bathtub is made, no matter how thick the porcelain or enamel which covers it. The magnet is a development of General Electric Co., Schenectady, N. Y.

Canadian War Orders Total $13,853,090

■ Canadian government is spending $3,000,000 for plant extensions to manufacture 750 large tanks for Canadian forces. Canadian Pacific Railway Co., Angus Shops, Montreal, is main contractor.

Orders are to be placed immediately for 3000 medium-size British-type tanks, 1200 for Canadian forces and the remainder for Great Britain.

C. D. Howe, Minister of Munitions and Supply, announced an order for six mine sweepers for Canadian navy has been placed with Canadian Vickers Ltd., Montreal, cost to be $3,600,000. This will bring number of vessels ordered through Canadian shipbuilders to 98 and total sum involved to above $60,000,000.

Navy Minister MacDonald stated last week that a British commission is to arrive soon to discuss building of merchant marine vessels in the dominion. Building of defense ships in Canada is well ahead of schedule, and 1941 contracts are being completed now, the Minister stated.

New contracts placed by department of munitions and supply aggregate $13,853,090, and orders placed with United States firms amount to $103,227. Awards include:

Machinery: Rudel Machinery Co. Ltd., Montreal, $8690; Williams and Wilson Ltd., Montreal, $74,669; Canadian Fairbanks-Morse Co. Ltd., Ottawa, $133,321; Sheridan Equipment Co. Ltd., Leaside, Ont., $87,230; Modern Tool Works, Toronto, $148,653; J. H. Ryder Machinery Co., Toronto, $118,987; A. R. Williams Machinery Co. Ltd., Toronto, $49,021; Williams and Wilson Ltd., Toronto, $56,286; Delamere & Williams Ltd., West Toronto, Ont., $48,600; Ford-Smith Machine Co. Ltd., Hamilton, $16,308; John Bertram & Sons Co. Ltd., Dundas, Ont., $556,332; Canadian Machinery Corp. Ltd., Galt, Ont., $7245; Ford Motor Co. of Canada Ltd., Windsor, $250,000; John E. Livingstone Machinery Co. Ltd., Windsor, $140,135.

Fire fighting equipment: LaFrance Fire Engine & Foamite Ltd., Montreal, $47,879.

Electric equipment: Aviation Electric Ltd., Montreal, $74,730; Canada Wire & Cable Co. Ltd., Montreal, $9544; Canadian Marconi Co., Montreal, $6823; Canadian General Electric Co. Ltd., Ottawa, $7348; Auto Electric Service Co. Ltd., Toronto, $6259; Canadian Telephones & Supplies Ltd., Toronto, $215,140; Federal Wire & Cable Co. Ltd., Guelph, Ont., $11,059.

Instruments: United States Gauge Co., Montreal, $23,925; Instruments Ltd., Ottawa, $5434; Stanley Mfg. Co. Ltd., Toronto, $24,459.

Shipbuilding: Ferranti Electric Ltd., Toronto, $8562; Imperial Oil Ltd., Toronto, $12,210; Burrard Dry Dock Co. Ltd., North Vancouver, B. C., $5500; Turner Boat Works, Vancouver, B. C., $26,460.

Dockyard supplies: British Admiralty, England, $13,500.

Mechanical transport: Canadian Lift Truck Co., Ltd., Montreal, $9620; Messrs. C. O. Monat & Co. Ltd., Montreal, $174,255; Dominion Rubber Co. Ltd., Ottawa, $6702; Four Wheel Drive Auto Co. Ltd., Kitchener, Ont., $384,540; Chrysler Corp. of Canada Ltd., Windsor, $5235.

Aircraft: Aviation Electric Ltd., Montreal, $60,506; Canadian Car & Foundry Co. Ltd., Montreal, $632,205; Noorduyn Aviation Ltd., Montreal, $21,944; Dunlop Tire & Rubber Goods Co. Ltd., Toronto, $12,950; Standard Tube Co. Ltd., Woodstock, Ont., $14,651.

Miscellaneous: General Steel Wares Ltd., Ottawa, $61,500; Woods Mfg. Co. Ltd., Ottawa, $100,170; Edouard Gohier Ltd., St. Laurent, Que., $48,857; Victor X-Ray Corp. of Canada Ltd., Montreal, $6196; Aluminum Co. of Canada Ltd., Montreal, $21,995; Dominion Rubber Co. Ltd., Ottawa, $18,750; International Silver Co. of Canada Ltd., Hamilton, $33,400; B. F. Goodrich Rubber Co. of Canada Ltd., Kitchener, Ont., $18,750.

Ordnance: War Office, England, $50,000; Turnbull Elevator Co. Ltd., Toronto, $44,675; Ford Motor Co. of Canada Ltd., Windsor, $12,060.

Munitions: Dominion Arsenal, Quebec, Que., $20,300; General Steel Wares Ltd., Montreal, $17,440.

Construction projects: Wheaton Bros. Ltd., Moncton, N. B., $33,467; Carter-Halls-Aldinger Co. Ltd., Toronto, $51,246; H. A. Wickett Co. Ltd., Toronto, $300,000; Piggott Construction Co. Ltd., Hamilton, $300,000; Barnett-McQueen Co. Ltd., Fort William, Ont., $321,260; North American Lumber & Supply Co. Ltd., Winnipeg, Man., $355,060; E. J. Ryan Construction Ltd., Vancouver, B. C., $29,559.

Died:

■ H. H. TIMKEN SR., 72, chairman of the board, Timken Roller Bearing Co., Canton, O., at his home in Canton, Oct. 14. Although still active in the business which he founded with his father and brother, in 1898, his two sons, H. H. Timken Jr., and W. Robert Timken in recent years have taken an active part in the management of the company. Mr. Timken attended public schools in St. Louis and spent many of his vacation periods in his father's carriage works. Following graduation from the University of California with a law degree, he practiced law in San Diego, but later gave it up to join his father who had re-entered the carriage and wagon-making field in St. Louis. In 1902 the business was moved to Canton, Mr. Timken becoming active head of the plant. He was a pioneer in the development of electric furnace steel. Mr. Timken was noted for his many philanthropies, his latest gift being the new Canton Timken vocational high school opened last year.

♦

Charles Andrew McCune, 61, research engineer and secretary, Magnaflux Corp., New York, in Atlantic City, N. J., Oct. 14. A native of Jersey City, N. J., Mr. McCune attended Cooper Union in New York and in 1900 became chief draftsman, Safety Car Heating & Lighting Co. Then, successively, he was assistant engineer and chief engineer, Commercial Acetylene Co.; sales engineer, Page Steel & Wire Co.; director of research, American Chain Co., and director of research, Welding Engineering & Research Corp. Since 1932 he had been associated with the Magnaflux Corp. Among Mr. McCune's technical achievements was the development of arc welding electrodes and development of cylinders for safe storage and transportation of acetylene. He was a past president, American Welding society, and International Acetylene association.

♦

Edgar Davis, 59, treasurer and director, Ingersoll-Rand Co., New York, and associated with the company 40 years, Oct. 14, in that city.

♦

William E. Gleason, 50, buyer for Cincinnati Planer Co., at his home in Cincinnati, Sept. 19. He had been employed by the company 25 years.

♦

Charles Edwin Clapp, 79, who retired in 1905 as a vice president of Crucible Steel Co. of America, New York, Oct. 5, at his home in Bedford Hills, N. Y.

♦

Fred Greenwood, 68, manager and for 40 years associated with W. E. Clark & Co., Boston, steel warehouse distributor, Oct. 12, at Winthrop, Mass.

♦

John H. Drew, 61, superintendent, W. D. Bidle Co., Cleveland, steel treating organization, Oct. 9, at his home in Lyndhurst, a suburb of Cleveland.

♦

Matthew C. Brush, 63, former president, American International Corp., in New York, Oct. 15. He was a director, Air Reduction Co., Vanadium Corp. of America, and other companies.

♦

Charles Porter Coffin, 82, retired steel company executive, Chicago, at his home in Evanston, Ill., Oct. 14. At one time he was secretary-treasurer, Minnesota Iron Co., and from 1902 to 1923 was credit manager, Illinois Steel Co.

♦

Thomas Neal, 82, who rose from a factory job to the presidency and board chairmanship of General Motors Corp., Detroit, 25 years ago, Oct. 5, in that city. He was chairman from 1913 to 1915, when, reorganization of the corporation having been completed, he resigned.

♦

Morrison Mills, 37, eastern district manager, construction equipment division, Chain Belt Co., Milwaukee, Sept. 25, in Philadelphia. Mr. Mills was service manager of the division from 1931 to 1937, and eastern district manager since that time.

♦

George Switzer, 40, prominent industrial designer, Oct. 8 in New York. At one time Mr. Switzer was a designer with Erwin Wasey & Co., Chicago advertising agency. He later went to New York, and in 1929 established his own offices as designer and consultant.

Steel Allocations Becoming Prevalent

Raw steel rationed within companies while finished items, among users. Preferential rating slips used. Ingot rate now 95

MARKET IN TABLOID ★

Demand
Heavy, tending to gain.

Prices
Strong for most products.

Production
Up ½ point to 95; best sinc June, 1929.

■ TIGHTENING of the steel supply becomes increasingly apparent from week to week. Within steelmaking companies raw steel is being rationed among finishing departments on a scale not attained since the World war.

The next movement expected along this line is the shipping of raw materials far afield to mills where some finishing capacity still is open, particularly among plants of the same organization. This will, of course, increase freight costs. The delivery span between the placing of an order and receipt of materials ranges from three weeks, in the case of certain sheets and plates, to 12 weeks for alloy steel.

Steel operations advanced a half-point to 95 per cent of capacity last week, the peak since June, 1929. Undoubtedly the greatest tonnage in history is now being produced.

Possible bottlenecks are still discussed though actually not felt keenly as yet, items and departments mentioned being coke, scrap, pig iron, fluorspar, electric furnaces, heat-treating and forging departments. Though the tendency is to sell only to regular customers more and more, there is still considerable available to outsiders in certain items.

What may prove the entering wedge towards priorities is the increasing prominence of preferential rating slips issued by Washington defense bodies to certain consumers. These slips are presented by consumers to steel producers, showing that the former are entitled to certain steel on certain dates for specific defense contracts to be filled.

Steelmakers expect that by second half of 1941 they will be unable to accept much commercial business, concentrating on defense. Export business has dropped off except in tin plate, mostly for large oil cans. Damage to British oil refineries creates a demand for refined oil imports.

There is a definite fear of a pig iron shortage, particularly among merchant producers. The composite scrap price is unchanged at $20.54 per ton, probably reflecting recent conferences between the trade and government.

Possibility is seen in some quarters that revision may be needed in a recent official estimate that the defense program will not exceed 7,000,000 to 8,000,000 tons of ingots annually. Under PWA contracts steel requirements came to about one ton per each $1000 expended. Under the defense program the ratio should be higher. Moreover steel which does not go directly into munitions, such as for plant additions, machinery, etc. may swell the total to far above the 7,000,000 to 8,000,000-ton figure.

Percentage of capacity operations in the machine tool industry during September, 94.9 per cent, was at the highest level recorded since the National Machine Tool Builders' association first compiled these data in January, 1939.

Automobile production for the week ended Oct. 19 is estimated at 114,672 units, an increase of 6715 over the previous week, comparing with 70,114 in the corresponding week of 1939.

Iron ore operators predict that 10,000,000 tons will be shipped down the lakes during October and 5,000,000 tons in November bringing the total to 63,235,000 tons. Some additional tonnage will be moved in December. Ore-carrying vessels were fully engaged on Oct. 15, the same as a month before, the performance of the two months establishing records. Ore is still being bought, an inquiry for 20,000 tons appearing.

With bookings of fabricated structural steel already well over 1,000,000 tons, total contracts for 1940 will probably top the 1,305,049 tons booked last year. Meanwhile reasonably prompt deliveries become more impossible, the building of plant additions having been the chief early phase of our defense program.

In steel generally price considerations have been forced into the background, with timely deliveries the chief consideration.

Operations in four districts gained the past week; at two substantial declines took place because of furnace repairs; while six remained unchanged. Pittsburgh rose 1 point to 90, Wheeling 1 point to 98, Chicago 1 point to 99, Youngstown 2 points to 90. On the other hand Cleveland dropped 2½ points to 85½ and New England 7 points to 85. Rates were held unchanged as follows: Birmingham at 97, St. Louis at 82½, Cincinnati at 90, eastern Pennsylvania at 93, Buffalo at 90½ and Detroit at 96.

COMPOSITE MARKET AVERAGES

	Oct. 19	Oct. 12	Oct. 5	One Month Ago Sept., 1940	Three Months Ago July, 1940	One Year Ago Oct., 1939	Five Years Ago Oct., 1935
Iron and Steel	$38.07	$38.07	$38.05	$37.93	$37.63	$37.62	$32.84
Finished Steel	56.60	56.60	56.60	56.60	56.60	55.90	53.70
Steelworks Scrap..	20.54	20.54	20.62	20.05	18.56	21.45	12.72

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

COMPARISON OF PRICES

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

Finished Material

	Oct. 19, 1940	Sept. 1940	July 1940	Oct. 1939
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Iron bars, Chicago	2.25	2.15	2.15	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.275
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.00
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.00
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	5.00	5.00	5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.50

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅜-inch, Pitts.	2.00	2.00	2.00	1.92

Pig Iron

	Oct. 19, 1940	Sept. 1940	July 1940	Oct. 1939
Bessemer, del. Pittsburgh	$24.34	$24.34	$24.34	$24.34
Basic, Valley	22.50	22.50	22.50	22.50
Basic, eastern, del. Philadelphia	24.34	24.34	24.34	24.34
No. 2 foundry, Pittsburgh	24.21	24.21	24.21	24.21
No. 2 foundry, Chicago	23.00	23.00	23.00	23.00
Southern No. 2, Birmingham	19.38	19.38	19.38	19.38
Southern No. 2 del. Cincinnati	22.89	22.89	22.89	22.89
No. 2X, del. Phila. (differ. av.)	25.215	25.215	25.215	25.215
Malleable, Valley	23.00	23.00	23.00	23.00
Malleable, Chicago	23.00	23.00	23.00	23.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	30.34
Gray forge, del. Pittsburgh	23.17	23.17	23.17	23.17
Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	105.33

Scrap

Heavy melt. steel, Pitts.	$21.50	$20.15	$19.55	$23.15
Heavy melt. steel, No. 2, E. Pa.	19.75	19.69	17.50	20.00
Heavy melting steel, Chicago	19.75	19.31	17.45	19.25
Rails for rolling, Chicago	24.25	21.37	21.65	21.90
Railroad steel specialties, Chicago	23.25	21.62	21.00	21.75

Coke

Connellsville, furnace, ovens	$4.75	$4.75	$4.75	$4.75
Connellsville, foundry, ovens	5.75	5.75	5.75	5.80
Chicago, by-product fdry., del.	11.75	11.25	11.25	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheet Steel

Hot Rolled

Pittsburgh	2.10c
Chicago, Gary	2.10c
Cleveland	2.10c
Detroit, del.	2.20c
Buffalo	2.10c
Sparrows Point, Md.	2.10c
New York, del.	2.34c
Philadelphia, del.	2.27c
Granite City, Ill.	2.20c
Middletown, O.	2.10c
Youngstown, O.	2.10c
Birmingham	2.10c
Pacific Coast ports	2.65c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast ports	3.70c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast ports	4.05c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.55c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.40c	4.00c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

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

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold strip	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.46c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.10c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast ports	2.65c

Steel Floor Plates

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

Structural Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast ports	2.75c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 20 tons or over)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast ports	2.80c

Rail Steel

(Base, 5 tons or over)

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

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

Iron

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

Reinforcing

New Billet Bars, Base

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

Rail Steel Bars, Base

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.50c

Wire Products

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

Standard and cement coated wire nails	$2.55
(Per Pound)	
Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c
Woven wire fencing (base C. L. column)	67
Single loop bale ties, (base C.L. column)	56
Galv. barbed wire, 80-rod spools, base column	70
Twisted barbless wire, column	70

To Manufacturing Trade

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

Bright bess., basic wire.	2.60c
Galvanized wire	2.60c
Spring wire	3.20c

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

Cut Nails

Carload, Pittsburgh, keg..$3.85

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

*Delivered.

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.70c

Detroit, delivered 2.80c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.70	3300	3.80
2500	2.55	3400	3.20

4100 0.15 to 0.25 Mo. 0.55

4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.20

5100 0.80-1.10 Cr. 0.45

5100 Cr. spring flats 0.15

6100 bars 1.20

6100 spring flats 0.85

Cr. N., Van. 1.50

Carbon Van. 0.85

9200 spring flats 0.15

9200 spring rounds, squares 0.40

Electric furnace up 50 cents.

Alloy Plates (Hot)

Pittsburgh, Chicago, Coatesville, Pa. 3.50c

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast ports	2.75c
Cooperage hoop, Young., Pitts.; Chicago, Birm..	2.20c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

½ x 6 and smaller 68 off

Do., ⅛ and ⅝ x 6-in. and shorter 66 off

Do., ¾ to 1 x 6-in. and shorter 64 off

1⅛ and larger, all lengths 62 off

All diameters, over 6-in. long 62 off

Tire bolts 52.5 off

Stove Bolts

In packages with nuts separate 72.5-10 off; with nuts attached 72.5 off; bulk 82 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts 60 off

Plow bolts 68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less.	66	70
⅝-1-inch	63	65
1⅛-1½-inch	61	62
1⅝ and larger	60	..

Hexagon Cap Screws

Upset 1-in., smaller 70.0 off

Square Head Set Screws

Upset, 1-in., smaller 75.0 off

Headless set screws 64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.85c
Pacific Coast ports	2.95c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.

Structural 3.40c

⅞-inch and under 65-10 off

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

Welded Iron, Steel Pipe

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

Butt Weld

In.	Blk.	Galv.
Steel		
½	63½	54
¾	66½	58
1—3	68½	60½
Iron		
¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel		
2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
Iron		
2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

	Blk.	Galv.
Steel		
1 to 3, butt weld	67½	
2, lap weld	60	
2½ to 3, lap weld	63	
3½ to 6, lap weld	65	
7 and 8, lap weld	64	
Iron		
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

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

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	.....
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	$ 7.82	$ 9.01
1¼" O.D.	13	9.26	10.67
1½" O.D.	13	10.23	11.79
1¾" O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼" O.D.	13	14.54	16.76
2¼" O.D.	12	16.01	18.45
2½" O.D.	12	17.54	20.21
2¾" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Pet Net Ton

6-in., & over, Birm.	$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00

Class A Pipe $3 over Class B Stnd. fitgs., Birm., base $100.00.

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

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

Forging Quality Billets

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

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago.	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl. (per 100 lbs.) $2.00

Do., over ⅜ to 11/32-in. incl. 2.15

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

Skelp

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

Coke

Price Per Net Ton

Beehive Ovens

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

By-Product Foundry

Newark, N. J., del.	11.38-11.85
Chicago, outside del.	11.00
Chicago, delivered	11.75
Terre Haute, del.	11.25
Milwaukee, ovens	11.75
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	11.25
Cincinnati, del.	11.00
Cleveland, del.	11.55
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	15.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	7.00c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

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

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birmingham, Ala.§	19.38	.....	18.38	24.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	.....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	...
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

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

Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	.....	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	‖Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	25.31	25.31	24.81	25.81
St. Louis, northern	23.50	23.50	23.00	.....
St. Louis from Birmingham	†23.12	.....	22.62	.....
St. Paul from Duluth	25.63	25.63	.....	26.13

†Over 0.70 phos.

Low Phos.

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

Gray Forge		Charcoal	
Valley furnace	$22.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

†Silvery

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

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

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

Refractories

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

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

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

Second Quality

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

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	26.00

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$50.00
Chem. bonded chrome	50.00
Magnesite brick	72.00
Chem. bonded magnesite	61.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$25.00-$26.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	19.00
Do. barge	19.00
No. 2 lump	20.00

Ferroalloy Prices

Ferromanganese, 78-82%, carlots, duty pd. $120.00
Ton lots 130.00
Less ton lots 133.50
Less 200 lb. lots 138.00
Do., carlots del. Pitts. 125.33

Spiegeleisen, 19-21% dom.
Palmerton, Pa., spot 36.00
Do., 26-28% 49.50

Ferrosilicon, 50%, freight allowed, c.l. 74.50
Do., ton lot 87.00
Do., 75 per cent 135.00
Do., ton lots 151.00
Spot, $5 a ton higher.

Silicomanganese, c.l., 2½ per cent carbon 118.00
2% carbon, 108.00; 1%, 133.00
Contract ton price $12.50 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.90-2.00

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 11.00c
Do., ton lots 11.75c
Do., less-ton lots 12.00c

67-72% low carbon:

	Carloads	Ton lots	Less ton
2% carb.	17.50c	18.25c	18.75c
1% carb.	18.50c	19.25c	19.75c
0.10% carb.	20.50c	21.25c	21.75c
0.20% carb.	19.50c	20.25c	20.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do., less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do., spot 145.00
Do., contract, ton lots 145.00
Do., spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do., spot 160.00
Do., contract, ton lots 160.00
Do., spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do., ton lots 8.00c
Do., less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk 7.00c
Do., ton lots 7.50c
Do., less-ton lots 7.75c
Do., less 200 lbs. 8.00c
Spot, ¼c higher.

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.50
Do., smaller lots 2.60

Vanadium Pentoxide, contract, lb. contained $1.10
Do., spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 84.00c
Do., spot 89.00c
88% chrome, contract 83.00c
Do., spot 88.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads, bulk, freight allowed, ton $69.50
Ton lots 79.50
Less-ton lots, lb. 3.75c
Less 200 lb. lots, lb. 4.00c
Spot ¼-cent higher.

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton 102.50
Do., spot 107.50

34-40%, contract, carloads, lb., alloy 14.00c
Do., ton lots 15.00c
Do., less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do., 100-200 lb. lots 2.75
Do., under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant $0.00c

WAREHOUSE STEEL PRICES

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

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: S.A.E. 2300	Cold Drawn Bars: S.A.E. 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.66	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.30	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.25	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.05	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.00	3.22	3.75	8.40	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	....	4.45	....	3.65	8.15	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.42	3.20	3.75	8.40	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.23	4.30	4.64	3.20	3.80	8.70	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	...	5.00	....	4.42	....	....
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.47	4.00	8.50	7.20
Chicago	3.50	3.40	3.40	3.55	3.56	5.15	3.05	4.10	4.60	3.30	3.75	8.15	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	....	4.76	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.70	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.33	4.33	5.93	3.99	....	5.71	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.88	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....	....	....	....
Seattle	4.00	3.85	5.20	3.65	3.75	5.75	3.70	6.50	5.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.60	6.45	4.00	4.00	6.40	4.30	6.50	5.25	....	6.60	10.55	9.80
San Francisco	3.50	4.00	6.00	3.35	3.35	5.60	3.40	6.40	5.15	....	6.80	10.65	9.80

	S.A.E. Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.20	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

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

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

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Official Rates of Exchange

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports	Continental North Sea ports gross tons‡‡: Quoted in dollars at current value	Continental North Sea ports gross tons‡‡: **Quoted in gold pounds sterling
	£ s d		£ s d
Foundry, 2.50-3.00 Si.	....	$33.23	3 18 0
Basic bessemer	....	.....	.....
Hematite, Phos. .03-.05	....	.....	.....
Billets	....	$31.95	3 15 0
Wire rods, No. 5 gage	....	60.71	7 2 6
Standard rails	....	$48.99	5 15 0
Merchant bars	2.66c 14 15 0	2.77c	7 6 0
Structural shapes	2.48c 13 15 0	2.83c	7 9 0
Plates, ¼ in. or 5 mm.	2.68c 14 17 6	3.53c	9 6 0
Sheets, black, 24 gage or 0.5 mm.	3.40c 18 17 6	2.98c	7 17 0°
Sheets, gal., 24 ga., corr.	3.98c 22 2 6	3.94c	10 7 6
Bands and strips	....	2.76c	7 5 0
Plain wire, base	....	3.15c	8 6 3
Galvanized wire, base	....	3.75c	9 17 6
Wire nails, base	....	3.56c	9 7 6
Tin plate, box 108 lbs.	$ 5.61 1 7 9	.....	.....

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French ‡‡Francs		Belgian ‡‡Francs		Reich ‡‡Mar
Fdy. pig iron, Si. 2.5	$24.24	6 0 0(a)	$17.18	788	$31.44	950	$25.33	63
Basic bess. pig iron	22.83	5 13 0(a)	.....	...	29.79	900	27.94	(b) 69.50
Furnace coke	6.77	1 13 5	4.91	225	10.92	320	7.64	19
Billets	42.42	10 10 0	26.62	1,221	42.20	1,275	38.79	96
Standard rails	2.30c	12 15 6	1.69c	1,692	2.06c	1,375	2.38c	132
Merchant bars	2.78c	15 8 6††	1.53c	1,530	2.06c	1,375	1.98c	110
Structural shapes	2.46c	13 13 0††	1.49c	1,487	2.06c	1,375	1.93c	107
Plates, †¼-in. or 5 mm.	2.55c	14 3 0††	1.95c	1,951	2.42c	1,610	2.29c	127
Sheets, black	3.49c	19 17 6§	2.30c	2,295‡	2.85c	1,900‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.07c	22 12 6	3.59c	3,589	4.80c	3,200	6.66c	370
Plain wire	3.83c	21 5 0	2.34c	2,340	3.00c	2,000	3.11c	173
Bands and strips	2.91c	16 3 6††	1.71c	1,713	2.48c	1,650	2.29c	127

†British snip-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price.

British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel.

(a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed.

††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. ‡‡No quotations.

IRON AND STEEL SCRAP PRICES

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

HEAVY MELTING STEEL

Birmingham, No. 1.	18.00
Bos. dock No. 1 exp.	17.00-17.50
New Eng. del. No. 1	17.00-17.50
Buffalo, No. 1	20.00-20.50
Buffalo, No. 2	18.00-18.50
Chicago, No. 1	19.50-20.00
Chicago, auto, no alloy	18.50-19.00
Cincinnati, dealers	17.00-17.50
Cleveland, No. 1	20.50-21.00
Cleveland, No. 2	19.50-20.00
Detroit, No. 1	†16.50-17.00
Detroit, No. 2	†15.50-16.00
Eastern Pa., No. 1	20.50-21.00
Eastern Pa., No. 2	19.50-20.00
Federal, Ill., No. 2	16.50-17.00
Granite City, R. R. No. 1	17.25-17.50
Granite City, No. 2	16.00-16.50
Los Ang., No. 1 net	13.00-13.50
Los Ang., No. 2 net	12.00-12.50
N. Y. dock No. 1 exp.	†17.00
Pitts., No. 1 (R. R.)	23.00-23.50
Pittsburgh, No. 1	21.00-22.00
Pittsburgh, No. 2	19.50-20.00
St. Louis, No. 1	17.50-18.00
St. Louis, No. 2	16.50-17.00
San Fran., No. 1 net	13.00-13.50
San Fran., No. 2 net	12.00-12.50
Seattle, No. 1	15.00
Toronto, dirs., No. 1	11.00-11.25
Valleys, No. 1	21.00-21.50

COMPRESSED SHEETS

Buffalo	18.00-18.50
Chicago, factory	19.00-19.50
Chicago, dealers	17.50-18.00
Cincinnati, dealers	16.00-16.50
Cleveland	20.00-20.50
Detroit	†18.25-18.75
E. Pa., new mat.	21.00
E. Pa., old mat.	17.50-18.00
Los Angeles, net	9.50-10.00
Pittsburgh	21.00-22.00
St. Louis	14.00-14.50
San Francisco, net	9.50-10.00
Valleys	19.50-20.00

BUNDLED SHEETS

Buffalo, No. 1	18.00-18.50
Buffalo, No. 2	16.50-17.00
Cleveland	15.00-15.50
Pittsburgh	19.50-20.00
St. Louis	13.00-13.50
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	14.00-14.50
Cincinnati, dealers	11.50-12.00
Detroit	†14.75-15.25
St. Louis	12.25-12.75
Toronto, dealers	9.00

BUSHELING

Birmingham, No. 1.	14.50
Buffalo, No. 1	18.00-18.50
Chicago, No. 1	18.50-19.00
Cincin., No. 1 deal.	13.00-13.50
Cincin., No. 2 deal.	7.25- 7.75
Cleveland, No. 2	14.00-14.50
Detroit, No. 1 new	†17.50-18.00
Valleys, new, No. 1	19.50-20.00
Toronto, dealers	5.50- 6.00

MACHINE TURNINGS (Long)

Birmingham	7.50
Buffalo	13.50-14.00
Chicago	13.75-14.25
Cincinnati, dealers	9.75-10.25
Cleveland, no alloy	13.50-14.00
Detroit	†10.00-10.50
Eastern Pa.	14.50-15.00
Los Angeles	4.00- 5.00
New York	†9.00- 9.50
Pittsburgh	15.50-16.00
St. Louis	10.50-11.00
San Francisco	5.00
Toronto, dealers	7.25- 7.50
Valleys	14.00-14.50

SHOVELING TURNINGS

Buffalo	14.50-15.00
Cleveland	14.00-14.50
Chicago	14.00-14.50
Chicago, spcl, anal.	15.00-15.50
Detroit	†12.25-12.50
Pitts., alloy-free	17.00-17.50

BORINGS AND TURNINGS
For Blast Furnace Use

Boston district	†7.50- 8.00
Buffalo	13.00-13.50
Cincinnati, dealers	8.00- 8.25
Cleveland	14.00-14.50
Eastern Pa.	13.00-13.50
Detroit	†12.00-12.50
New York	†8.75- 9.00
Pittsburgh	14.00-14.50
Toronto, dealers	7.00- 7.25

AXLE TURNINGS

Buffalo	16.50-17.00
Boston district	†12.00-12.50
Chicago, elec. fur.	19.00-19.50
East. Pa. elec. fur.	19.50-20.00
St. Louis	23.25-23.75
Toronto	7.25- 7.50

CAST IRON BORINGS

Birmingham	8.50
Boston dist. chem.	†9.75-10.00
Buffalo	13.00-13.50
Chicago	13.50-14.00
Cincinnati, dealers	8.00- 8.25
Cleveland	14.00-14.50
Detroit	†12.00-12.50
E. Pa., chemical	14.50-15.00
New York	†8.75- 9.00
St. Louis	10.00-10.50
Toronto, dealers	7.25- 7.50

RAILROAD SPECIALTIES

Chicago	23.00-23.50

ANGLE BARS—STEEL

Chicago	22.00-22.50
St. Louis	20.50-21.00

SPRINGS

Buffalo	24.50-25.00
Chicago, coil	24.00-24.50
Chicago, leaf	23.00-23.50
Eastern Pa.	25.00-26.00
Pittsburgh	28.00-28.50
St. Louis	22.25-22.75

STEEL RAILS, SHORT

Birmingham	19.50
Buffalo	25.50-26.00
Chicago (3 ft.)	22.75-23.25
Chicago (2 ft.)	23.50-24.00
Cincinnati, dealers	23.75-24.25
Detroit	†23.00-23.50
Pitts., 2 ft. and less	27.00-27.50
St. L. 2 ft. & less	23.75-24.25

STEEL RAILS, SCRAP

Birmingham	17.00
Boston district	†14.50-15.00
Buffalo	22.00-22.50
Chicago	20.50-21.00
Cleveland	24.00-24.50
Pittsburgh	24.00-24.50
St. Louis	20.25-20.75
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net	13.00-13.50
Cincinnati, dealers	12.75-13.25

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	14.00-14.50
Cincinnati, dealers	12.25-12.75
Eastern Pa.	18.00
New York	†12.00-12.50
St. Louis	14.00-14.50

RAILROAD WROUGHT

Birmingham	16.00
Boston district	†9.50-10.00
Eastern Pa., No. 1	20.00-20.50
St. Louis, No. 1	15.00-15.50
St. Louis, No. 2	16.50-17.00

FORGE FLASHINGS

Boston district	†12.00-12.25
Buffalo	18.00-18.50
Cleveland	19.00-19.50
Detroit	†16.50-17.00
Pittsburgh	19.50-20.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	23.25-23.75

LOW PHOSPHORUS

Cleveland, crops	23.50-24.00
Eastern Pa., crops	25.00-25.50
Pitts., billet, bloom, slab crops	28.00-28.50

LOW PHOS. PUNCHINGS

Buffalo	24.00-24.50
Chicago	22.75-23.25
Cleveland	21.50-22.00
Eastern Pa.	25.00-25.50
Pittsburgh	26.50-27.00
Seattle	15.00
Detroit	†20.00-20.50

RAILS FOR ROLLING
5 feet and over

Birmingham	20.00
Boston	†17.50-18.00
Chicago	24.00-24.50
New York	†18.50-19.00
Eastern Pa.	25.00-26.00
St. Louis	23.50-24.00

STEEL CAR AXLES

Birmingham	18.00
Boston district	†18.50-19.00
Chicago, net	24.00-24.50
Eastern Pa.	25.00-25.50
St. Louis	24.00-24.50

LOCOMOTIVE TIRES

Chicago (cut)	22.50-23.00
St. Louis, No. 1	20.50-21.00

SHAFTING

Boston district	†19.00-19.25
New York	†19.50-20.00
Eastern Pa.	25.00-25.50
St. Louis, 1¼-3¾"	19.75-20.25

CAR WHEELS

Birmingham, iron	15.00
Boston dist., iron	†15.50-16.00
Buffalo, steel	24.50-25.00
Chicago, iron	20.00-20.50
Chicago, rolled steel	23.50-24.00
Cincin., iron deal.	20.00-20.50
Eastern Pa., iron	21.50-22.00
Eastern Pa., steel	25.50-26.00
Pittsburgh, iron	22.00-22.50
Pittsburgh, steel	28.00-28.50
St. Louis, iron	20.00-20.50
St. Louis, steel	22.00-22.50

NO. 1 CAST SCRAP

Birmingham	17.00
Boston, No. 1 mach.	†16.75-17.25
N. Eng. del. No. 2	15.50-16.00
N. Eng. del. textile	20.00-21.00
Buffalo, cupola	18.50-19.00
Buffalo, mach.	20.00-20.50
Chicago, agri. net	15.50-16.00
Chicago, auto net	18.25-18.75
Chicago, railr'd net	17.00-17.50
Chicago, mach. net	17.00-17.50
Cincin., mach. deal.	20.75-21.25
Cleveland, mach.	22.50-23.00
Detroit, cupola, net	†17.00-17.50
Eastern Pa., cupola	22.50-23.00
E. Pa., No. 2 yard	19.00-19.50
E. Pa., yard fdry.	19.50
Los Angeles	16.50-17.00
Pittsburgh, cupola	20.50-21.00
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	19.25-19.75
St. L., No. 1 mach.	19.75-20.25
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break.	†15.25-15.50
New England, del.	16.25-16.75
Buffalo, break	17.50-18.00
Cleveland, break, net	16.50-17.00
Detroit, auto net	†17.25-17.75
Detroit, break.	†15.00-15.50
Eastern Pa.	21.00-21.50
Los Ang., auto, net.	13.00-14.00
New York break	†16.00-16.50

STOVE PLATE

Birmingham	10.00-11.00
Boston district	†11.50-11.75
Buffalo	17.00-17.50
Chicago, net	13.00-13.50
Cincinnati, dealers	12.75-13.25
Detroit, net	†12.00-12.50
Eastern Pa.	17.50
New York fdry	†13.50
St. Louis	†13.25-13.75
Toronto dealers, net	12.00

MALLEABLE

New England, del.	22.00-23.00
Buffalo	22.50-23.00
Chicago, R. R.	23.00-23.50
Cincin. agri., deal.	18.25-18.75
Cleveland, rail	23.50-24.00
Eastern Pa., R. R.	22.50-23.00
Los Angeles	12.50
Pittsburgh, rail	25.00-25.50
St. Louis, R. R.	20.00-20.50

Ores

Lake Superior Iron Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	10.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos	nom.
Spanish, No. African basic, 50 to 60%	nom.
Chinese wolframite, net ton, duty pd.	$23.50-24.00
Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c
F.O.B. Rio Janeiro.	
Scheelite, imp.	$25.00
Chrome ore, Indian, 48% gross ton, cif.	$28.00-30.00

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	.....
So. African, 50-52%	54.00-55.00
Indian, 49-50%	54.00
Brazilian, 46%	50.00
Cuban, 50-51%, duty free	67.50

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

—The Market Week—

Sheets, Strip

Sheet & Strip Prices, Pages 78, 79

Pittsburgh—Sheet buying continues to gain slightly. Automotive releases are good. Miscellaneous buying is fairly active and substantially ahead of last month. Operations are now close to 80 per cent on sheet mills, with narrower strip mills about 70 per cent. Galvanized sheet output is up to 80 per cent of capacity, the highest rate of the past decade. Government demand for galvanized material is the prime interest, principally for defense needs in connection with army housing, although fairly good tonnage is being produced for agricultural work, principally corn cribs.

Cleveland—Purchasing by automobile makers continues light, but a revival by the middle of November is looked for here. However buying by miscellaneous users is increasing, though not at the rate of heavy steels. Makers of refrigerators have stepped up production considerably, using more sheets. In the strip market minimum delivery periods are about as follows: Hot-rolled, three weeks; cold-rolled, six to eight weeks; stainless steel, ten to twelve weeks.

Boston—Narrow cold strip bookings are adding to mill backlogs despite heavy shipments and increased rerolling schedules. Consumption is mounting, but volume of placements strongly points to considerable buying for inventory against possible future delays in deliveries, which are lengthening on some finishes and specialties, with low carbon procurable in around five weeks.

Philadelphia—Sheet orders are expanding gradually, partly reflecting a tendency for buyers to anticipate needs further ahead. Mill backlogs are expanding though some producers still are able to offer relatively early delivery compared with the delayed situation in heavy products.

New York—Sheet consumers step up orders to meet requirements for work in sight and to build up stock. Delivery schedules expand, and many believe the situation will become tighter. Some expect priorities on government work will further complicate. Despite efforts of jobbers to keep stocks rounded, some items have become low. Recently it was virtually impossible to obtain 36 by 96-inch galvanized sheets, and one or two other items were almost as scarce. Galvanized sheet deliveries run several weeks, where producers can not draw on stocks.

More narrow cold strip tonnage

is being booked for first quarter delivery at open prices. As deliveries on some alloy and specialty items lengthen, tendency to place protection orders is more widespread. Orders to fill defense contracts are bginning to filter in, but most such tonnage is yet to be bought.

Buffalo—Capacity rolling schedules six days a week are necessary to keep sheet and strip order backlogs from getting out of bounds. Deliveries are being extended from four to five weeks, which is about the best showing in rolled products, but there are no indications of the situation tending to ease.

Cincinnati—Sheet and strip buying last week nearly balanced production, without extending backlogs. Mills announce a fair tonnage on national defense demand, believed a forerunner of larger requirements. Automotive specifications tend to taper, with recent commitments not heavy.

St. Louis—Specifications and buying of steel sheets and strip tend upward. Improvement extends to most descriptions, but has been heaviest in galvanized. Deliveries on strip and enameling stocks have been further extended.

Birmingham, Ala.—Strip is only fairly active, but movement of sheets continues to show improvement in nearly all items. Delivery dates are further extended.

Toronto, Ont. — Orders for sheets are increasing from war equipment makers and inquiries indicate still greater demand as work gets under way. Mills report booking for delivery into second quarter, and it is learned that no sheets are available for delivery on new orders in less than 90 days.

Plates

Plate Prices, Page 78

Pittsburgh—Specifications and orders are still running ahead of shipments, with heaviest portion of output going to marine work. New facilities are being rushed to completion on armor plate, and it is expected this will ease the jam somewhat by the first of the year. Most current buying is for delivery next year, with buyers attempting to protect themselves as far as possible.

Cleveland—December is about the best delivery obtainable by buyers. Purchasing is well distributed among tank, car, shipbuilding and miscellaneous trades. The opening of the all-weather highway from Harrisburg to Pittsburgh is expected to enable makers at Harrisburg and points east to increase sales into this district. A large consumption is going into the manufacture of net tenders on a $7,500,000 government contract placed here.

Boston—Plate specifications are maintained by shipyard, construction and miscellaneous releases with more car-lot shipments specified.

Fabricating shop, boiler and structural buying is somewhat spotty, but slightly improved, the same applying to railroads, although the latter hold close to maintenance needs. Jobbers are getting better volume. Light tank plates can be delivered in two to three weeks; heavier and alloys around eight.

New York—Plate demand is increasingly active, with inquiry diversified. The principal movement, however, is into the shipbuilding field, although building construction and railroad equipment requirements are becoming increasingly prominent. Export demand from England has eased somewhat,

although sellers regard this as only temporary, and report that there is increasing inquiry fom South Africa, South America and the Dutch East Indies. With domestic demand expanding sellers are becoming less interested in foreign business and have recently increased export prices $4 a ton to 2.35c f.a.s., freight allowed. An advance has also been made in shapes, which are now holding at 2.35c.

Philadelphia—October bookings of plates are well ahead of a month ago and are in excess of shipments, with backlogs accumulating. Work related to defense is the dominant factor but miscellaneous buying is active. Export shipments are fairly heavy but little new British buying is noted. Railroad needs are increasing. Delivery is most extended on heavy plates though unfilled orders on other gages are increasing.

San Francisco—Interest centers around the outcome of bids just opened on 4900 tons of plates for ten seaplane tenders for the navy. Several inquiries are out and include one lot of over 1000 tons for a Seattle interest. Awards aggregate 860 tons, bringing the total for the year to 166,489 tons, compared with 89,206 tons for the corresponding period in 1939.

Plate Contracts Placed

345 tons, tanks, Steel Tank Construction Co., Magnolia, Beaumont, Tex., to Petroleum Iron Works Co., Sharon, Pa.

210 tons, tanks, Quincy Oil Co., Quincy, Mass., to Chicago Bridge & Iron Co., Chicago.

195 tons, storage tanks, Sherwin-Williams Co., Gloucester, N. J., to Sharpsville Boiler Works Co., Sharpsville, Pa.

160 tons, pressure holder, Utility Management Corp., Flemington, N. J., to Tippett & Wood, Phillipsburg, N. J.

125 tons, 51½-inch water main extension for Seattle, to Puget Sound Machinery Depot, Seattle.

Unstated tonnage, gas-holder, Edgewood arsenal, Maryland, to Graver Tank & Mfg. Co., East Chicago, Ind., $14,878.

Plate Contracts Pending

Unstated, digesters and other equipment, plant extension Puget Sound Pulp & Timber Co., Bellingham, Wash.

Unstated, storage system and disposal plant, McChord Field, Wash.; Allen & Early, Tacoma, general contractor.

Tin Plate

Tin Plate Prices, Page 78

Pittsburgh — Operations have gained slightly to 42 per cent, principally on buying by packers on material which will not be slated for delivery until next year. There has also been a normal seasonal increase in general line material and some export business has developed unexpectedly, principally in oil cans.

Bars

Bar Prices, Page 78

Pittsburgh — Local bar mills, while not yet at full capacity in some cases, are nevertheless beginning to feel considerable pressure on deliveries. Principal source of new business is the defense program, with inquiries increasing from producing companies now at work on armament orders. Automobile demand is heavy; miscellaneous buying fairly good. Prices are strong.

Cleveland—Incoming business is at about the rate of production. Raw steel is now being rationed in somewhat miserly fashion among the various finishing departments, with that alloted to bar manufacture not quite as much as wanted. Demand for bars is well diversified, with automobile makers buying fair quantities. Some sales carry late Novem-

ber deliveries; others run well into December.

Boston—Deliveries are a mounting factor in bar demand, alloys presenting the more difficult problem. More consumers are covered through, and sometimes beyond, the end of the year. Heavier consumption brings intensified pressure for deliveries. Some system of priority shipment on defense contracts is predicted, with machine and aircraft shops getting favored positions by mills and secondary distributors. Broken-sized gaps in stocks of electric furnace and special finished alloy bars are being filled with more difficulty. Specifications are more diversified.

New York—Demand for bars is becoming increasingly diversified, and while by far the major portion in this district is being consumed by the machine tool and airplane equipment industries, there are growing requirements from railroads, government shops, bolt and nut manufacturers and manufacturers of marine hardware and from the ship yards themselves.

Philadelphia—Merchant bar shipments are still being extended. Some consumers have been unable to accumulate larger inventories and are pressing mills for deliveries. Miscellaneous users account for an increasing share with heavy shipments to machinery and equipment manufacturers, cold drawers and warehouses.

Birmingham, Ala. — Demand for bars continues unabated, with concrete reinforcing leading the field. Merchant bar deliveries are deferred.

Toronto, Ont. — Further expansion in merchant bar demand is reported. Booking now fully covers this year's output and orders are spreading into 1941. Canada's war industry largely is responsible for much of the new demand and large tonnage orders are being placed on this account.

Pipe

Pipe Prices, Page 79

Pittsburgh—Oil country business has begun to decline seasonally, and there are signs that line pipe also will begin to slow up. However, several major projects are being considered, some of which may mature before the year is out. Standard pipe demand is still good, with backlogs heavy and showing no signs of declining. Pressure tubing, both from power plants resulting from industrial expansion now going on and from marine work, continues quite active.

Cleveland—Business in merchant pipe is called good enough, but not of the feverish proportions of many steel items, this being somewhat the off-season for merchant pipe. Business in casings is distinctly poor because of the unfavorable oil situation, particularly low prices in crude oil.

Boston—Demand for merchant steel pipe is expanding. Prompt delivery for government construction, plus better inquiry for general building are lowering nearby distributors' inventories at an accelerated pace. Resale prices tend to strengthen with mills taking a firmer stand on replacement tonnage. Not all shading has disappeared, however. Most steel pipe volume is on small diameters, six-inch and over improving less actively. Detroit Seamless Steel Tubes Co., Dearborn, Mich., has been awarded 19,200 feet, seamless steel tubing, at 9.01c, delivered Springfield, Mass., armory, under inv. 106.

New York—Odd lot requirements for extension of army camp facilities are resulting in a few orders for cast pipe, but buying by municipalities is seasonally light. Ex-

port demand is fair, including substantial purchases for Panama and shipments to South America. For gas main extensions, utilities are placing scattered tonnage.

Birmingham, Ala.—Pipe demand continues in excellent volume. Government projects are taking substantial quantities, and the west coast orders are heavy.

Seattle—Construction of a $7,500,000 national guard cantonment at Fort Lewis, Wash., involves considerable cast iron pipe. General contracts have been placed and subawards are expected immediately. Demand for pipe and accessories has imprmoved during the past month and promises to continue to the end of the year.

Cast Pipe Placed

890 tons, 8 to 16-inch, Springfield, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

550 tons, 4 to 10-inch, quartermaster, Fort Benning, Ga., to United States Pipe & Foundry Co., Birmingham, Ala.

500 tons, 16-inch, cement-lined, bell and spigot, Panama, schedule 4378, class 1, to United States Pipe & Foundry Co., Philadelphia, $25,125, delivered; also 100 tons, under schedule 4377, bids Oct. 7, to same foundry.

275 tons, 4 to 10-inch, Fresno, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

2500 tons, 6 to 20-inch, Los Angeles; United States Pipe & Foundry Co., Burlington, N. J., American Cast Iron Pipe Co., Birmingham, Ala., and Pacific States Cast Iron Pipe Co., Provo, Utah, low on certain schedules.

425 tons, Panama, schedule 4385, bids Oct. 8, American Cast Iron Pipe Co., Birmingham, low.

315 tons, 10-inch, cement-lined, Panama, schedule 4428, bids in Oct. 18, Washington.

120 tons, 4 to 12-inch, government housing, Newport, R. I.

Steel Pipe Pending

167 tons, copper-nickel alloy condenser tubes, bureau of supplies and accounts, navy department, schedule 3707; bids Oct. 29, deliveries Brooklyn, Philadelphia and Norfolk, Va.

Wire

Wire Prices, Page 79

Pittsburgh—Prices are firm in the merchant wire market, with demand good from jobbers, principally on construction items. Manufacturers' wire releases from automotive sources are good. Export demand is heavy, principally on merchant products. Some miscellaneous buying has been seen as principally going into inventory and wire users generally are buying for protection up to three or four months.

New York—Wire mill backlogs continue to build up, volume of incoming orders heavier than current shipments. Deliveries are more extended on some products, with mills voluntarily giving goods entering into defense articles preference. Producers are uncertain as to ability to clear all tonnage originally booked for fourth quarter shipment before the end of the year. Demand for spring wire is active with several substantial orders placed for army cots and bedding.

Boston—From widely diversified consumers, incoming wire orders continue ahead of current shipments which for some finishing departments are at capacity. As a result backlogs are increasing with additional tonnage being booked for first quarter delivery at open prices. Forward covering is more prevalent and consumers who first bought heavily for inventory several weeks ago are re-ordering.

Behind the Scenes with STEEL

Needless Worry

■ It's nice to be back again and we hope none of you three guys who wade through this stuff each week have worried over us unduly. As a matter of fact we've been hale and hearty for the last week and a half, having been running up and down the eastern half of the country just about two jumps ahead of Wendell Wilkie. For a while we thought all the bunting and brass bands were for us but not for long after a big, tough Providence cop stared us back onto the sidewalk with the rest of the flag wavers.

Picture Radio

■ Highspot of the trip to us was getting in on an hour's television broadcast in Schenectady at the congenial home of G. E.'s Bob Gibson. Several experimental sets are scattered about town and each Friday night the show is on from the G. E. studio. We were in on a news commentator (with pictures), a one act play, a movie short and some singing and tapdancing. To put it mildly, it's the nertz, even though it's in the same stage the automobile was when we were crawling underneath our first flivver to check the oil and putting paper between the dry cells to prevent shorting.

"Air" Mail

■ Every Friday at midnight up in Schenectady, G. E. contacts the Byrd Expedition down in Little America and carries on a two-way conversation with the Snow Cruiser and two of their bases. The families and friends of the boys down there send their mail over to Schenectady and the letters are read to them each Friday. Latest news from "down under" is that everything is going along swell.

Two-Bit Consolation

■ Richard M. Machol, *Business Week* statistician, apparently didn't flunk his chemistry in college. He calls a "boner" on us in the October 7 issue where we said that gold resists the action of all acids with the exception of a combination of muriatic and hydrochloric, which he explains correctly are the same. Unfortunately Mr. M. is also trying to collect two bucks on the basis of our one-issue offer of a few weeks ago. We're appeasing him quietly with a two-bit cigar.

Early Thanksgiving

■ In this campaign of badges, the newest one we've seen adorns the neat lapel of Bill Eisenman, generalissimo of the whopping big Metal Show getting under way at Cleveland's Public Auditorium. It reads: *Thanksgiving Day, Nov. 5.* Very subtle and also very non-committal.

Don't Miss It

■ And, incidentally, if by the time you read this you haven't planned on being in town for the Show, call the little woman right now and tell her to pack your bag. We've been in and out of there all week and can unconditionally guarantee the biggest and very best exposition yet.

Our Own Knitting

■ "When writing to prospective subscribers of *The Feminine Way* your tone must be either sedate, conservative, progressive, colloquial, jaunty or breezy" says a letter this morning from a list house trying to sell us "the most responsive list of feminine magazine subscribers anywhere." With a nice breezy approach we could undoubtedly get Mrs. Popkins and friends to overdraw hubby's account and send us $4 for a year of STEEL but it's no go. STEEL is read up and down the line in just a few thousand companies that are accounting for over 90 per cent of all the metalworking and metalproducing business in the country. That's the reason advertisers of things like steel or motors or welding rods find STEEL such an effective proposition and why, we suppose, our space salesmen can't get a bit of that Nylon hosiery business or even a single page from Pepsodent. SHRDLU.

Rails, Cars

Track Material Prices, Page 79

Carriers are about to enter the market for rails for their 1941 program and considerable tonnages are likely to be placed soon. Chicago & North Western plans to buy 16,000 tons, the Chicago, Milwaukee St. Paul & Pacific 20,000 tons, and the Chicago, Rock Island & Pacific 35,000 tons. The Erie, inquiring for 20,000 tons, may buy only 15,000 tons this fall, the remainder in the spring.

Car Orders Placed

Baltimore & Ohio, 1000 gondolas; 750 fifty-ton to American Car & Foundry Co., New York, and 250 sixty-five-ton, without ends, to Bethlehem Steel Co., Bethlehem, Pa.; in addition to 1000 wagon-top box cars, noted in a recent issue as being placed with own shops in Cumberland, Md., with trucks and underframes to be supplied by Bethlehem Steel Co.

Chicago, Burlington & Quincy, 1000 box cars, to own shops.

Great Northern, 2000 box cars; 1000 to Pullman Standard Car Mfg. Co., Chicago; 500 to American Car & Foundry Co., New York, and 500 to Pressed Steel Car Co., Pittsburgh.

Lehigh Valley, 750 freight cars; 500 fifty-five ton steel-sheathed, wood-lined box cars, to Pressed Steel Car Co., Pittsburgh; also 250 heavy-duty, mill-type, drop end gondolas, to Bethlehem Steel Co., Bethlehem, Pa.

Pere Marquette, 200 sixty-ton mill-type gondolas, to Bethlehem Steel Co., Bethlehem, Pa.

Southern Railway, 47 streamlined coaches, to Pullman-Standard Car Mfg. Co., Chicago.

Car Orders Pending

Alaska railroad, department of interior, twenty 50-ton flat cars, bids Nov. 1.

Atchison, Topeka & Santa Fe, 1000 to 3000 freight cars; contemplated.

Chief of army engineers, Washington, twenty 50-ton box cars and four 50-ton flat cars, bids Oct. 24.

Erie, 70 caboose cars, bids asked; in addition to 1200 miscellaneous freight cars, noted in a recent issue as being figured.

Lehigh-New England 300 hopper cars; bids asked.

Oliver Iron Co., 30 cubic yard air dump cars, pending.

Rail Orders Pending

Chicago & North Western, 16,000 tons.

Chicago, Milwaukee, St. Paul & Pacific, 20,000 tons, part of 1941 requirements.

Chicago, Rock Island & Pacific, 35,000 tons, including bridge steel and track accessories; court permission granted.

Erie, 20,000 tons; bids asked.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

Bolt, nut and rivet demand has reached a new peak for the year. Reflecting particularly industrial expansion, a much heavier tonnage

is now going to the construction field and a further gain is noted in shipbuilding requirements. Railroad specifications also are heavier. Much additional buying of this character is anticipated.

Shapes

Structural Shape Prices, Page 78

Pittsburgh—Inquiries and awards are heavy and unplaced tonnage remains virtually static. Projects which will come up soon are increasing, which indicates there will be little seasonal drop.

Philadelphia—Pressure for delivery is still intense but mills are unable to make headway against backlogs. Shipments generally are six to eight weeks.

Seattle—Important tonnages are expected to be in the market shortly for proposed plant extensions for Boeing Aircraft Co., Seattle, and Aluminum Co. of America, Vancouver, Wash. Fabricating shops are well booked and backlogs are rising. Poole & McGonigle, Portland, will supply 600 tons involved in the Tongue Point, Oreg., naval air base.

San Francisco—Fabricators are encouraged that more than 34,000 tons is pending, with prospects of numerous heavy projects being released for figures before the end of the year.

Toronto, Ont. — While war construction projects, including new plants, are responsible for brisk activity in structural steel, building activities by private enterprise also add large volume. Structural shape awards are exceeding 10,000 tons weekly and there is no indication of sharp reduction in prospective business. Industrial expansion projects financed by the federal government will call for upwards of 30,000 tons.

Shape Contracts Placed

10,000 tons, buildings D and E, Glenn L. Martin Co., Middle River, Md., to Fort Pitt Bridge Works, Pittsburgh.

4500 tons, including 2500 tons fabricated material, remainder of plain beams, grade crossing elimination, contract 6, Long Island railroad, Atlantic Ave., Brooklyn, N. Y., American Bridge Co., Pittsburgh, and Carnegie-Illinois Steel Corp., Pittsburgh, through Arthur A. Johnson Corp. and Necarro Corp., New York, joint contractors.

3000 tons, additional shipyard extension, Electric Boat Co., Groton, Conn., to Bethlehem Steel Co., Bethlehem, Pa., placed direct.

2500 tons, subway, section 5, contract 4, Atlantic avenue improvement, Brooklyn, N. Y., Long Island railroad, to American Bridge Co., Pittsburgh.

2400 tons, assembly and repair shop, revised plans, naval air station, Quonset Point, R. I., to Ingalls Iron Works, Birmingham, Ala., through Merritt-Chapman & Scott Corp. and George A. Fuller Co., New York, joint contractor.

2200 tons, duPont nylon plant, Martinsville, Va., to Belmont Iron Works, Philadelphia.

2000 tons, sheet steel piling, foundations, bridge over Connecticut river, Hartford, Conn., to Carnegie-Illinois Steel Corp., Pittsburgh, through A. I. Savin Construction Co., East Hartford, Conn.

1900 tons, 32 warehouse buildings, Arsenal, Utah, to Duffin Iron Works, Chicago.

1800 tons, addition grandstand, race track, Jamaica, N. Y., to American Bridge Co., Pittsburgh, through Robert Nash Co., New York.

Shape Awards Compared

	Tons
Week ended Oct. 19	50,930
Week ended Oct. 12	36,034
Week ended Oct. 5	36,353
This week, 1939	24,104
Weekly average, year, 1940	27,166
Weekly average, 1939	22,411
Weekly average, Sept.	66,171
Total to date, 1939	954,617
Total to date, 1940	1,140,991

Includes awards of 100 tons or more.

1700 tons, sheet piling, East River drive, Forty-first to Forty-ninth street, New York, to Bethlehem Steel Co., Bethlehem, Pa., through Reiss & Weinsier Inc., New York.

1500 tons, ship fitters' shop, Philadelphia navy yard, to Bethlehem Steel Co., Bethlehem, Pa., through Hughes Foulkrod Co., Philadelphia.

1050 tons, hangar, Coco Solo, Panama, to United States Steel Export Co., New York, through Hegeman-Harris Co., New York.

1000 tons, railway and highway bridges, Kettle river gorge, Boyds, Wash., bureau of reclamation, to Pittsburgh Des Moines Steel Co., Pittsburgh.

900 tons, extension Sikorsky Aviation Corp., Stratford, Conn., to Bethlehem Fabricators Inc., Bethlehem, Pa.

900 tons, hangar for port of Oakland, Oakland, Calif., to Judson-Pacific Co., San Francisco.

900 tons, two storehouses, specification 10034, naval fleet supply depot, Oakland, Calif., to Judson-Pacific Co., San Francisco.

750 tons, plant addition, Aluminum Co. of Canada Ltd., at Kingston, Ont., to Hamilton Bridge Co., Hamilton, Ont.

690 tons, buildings, projects 11 and 29, naval air station, Quonset Point, R. I., to Harris Structural Steel Co., Plainfield, N. J.

650 tons, 9 ammunition magazines, Edgewood, Md., for army, to Belmont Iron Works, Philadelphia.

600 tons, office building for Canadian National Railways at Winnipeg, Man., to Dominion Bridge Co. Ltd., Winnipeg, Man.

600 tons, aircraft assembly plant at Edmonton, Alta., for department of munitions and supply, Ottawa, Ont., to Dominion Bridge Co. Ltd., Edmonton, Alta.

600 tons, naval air base, Tongue Point, Oreg., to Poole & McGonigle, Portland; Austin Co., general contractor.

600 tons, aqueduct race track extensions, New York, to Belmont Iron Works, Philadelphia.

500 tons, plant addition for Canadian Locomotive Works Ltd. at Kingston, Ont., to Dominion Bridge Co. Ltd., Lachine, Que.

500 tons, extension to power house, Toledo Edison Co., Toledo, O., to American Bridge Co., Pittsburgh.

475 tons, factory building, Bendix Aviation Corp., Scintilla Magneto division, Sidney, N. Y., to American Bridge Co., Pittsburgh.

445 tons, addition, building 625, Aluminum Co. of America, Alcoa, Tenn., to Converse Bridge & Steel Co., Chattanooga, Tenn.

435 tons, bridge FAGM-844B (1), St. Louis county, Missouri, to American Bridge Co., Pittsburgh.

425 tons, highway bridge, North East, Pa., to Bethlehem Steel Co., Buffalo, through Border Building Co., Buffalo.

380 tons, highway bridge 189, Chagrin Falls, O., for Cuyahoga county, to Fort Pitt Bridge Works, Pittsburgh.

375 tons, roof trusses and beams, military residence, Compton, R. I., army engineers' office, to American Bridge Co., Pittsburgh.

350 tons, addition to building, Elliott Co., Jeannette, Pa., to Fort Pitt Bridge Works, Pittsburgh.

335 tons, bridge, B1 of 79-13-5, Caro, Mich., to R. C. Mahon Co., Detroit.

320 tons, fabricated roof trusses and roof beams, U. S. engineer, Providence, R. I., delivery Little Compton, R. I., to American Bridge Co., Pittsburgh, $26,200; bids Oct. 2, inv. 39.

310 tons, 15 magazine structures, Edgewood arsenal, Maryland, to Dietrich Bros. Inc., Baltimore.

300 tons, extension to factory building, Hoover Co., N. Canton, O., to Burger Iron Co., Akron, O.

300 tons, factory building, Timken Roller Bearing Co., Canton, O., to American Bridge Co., Pittsburgh.

295 tons, bridge CWR-286, Hays-Caldwell counties, Texas, to Virginia Bridge Co., Roanoke, Va.

285 tons, miscellaneous structural material, Perkins Homes housing project, Baltimore, to Dietrich Bros. Inc., Baltimore.

270 tons, retail market buildings, Brooklyn and Bronx, N. Y., two contracts, city projects, to Dreier Iron Works Inc., New York.

270 tons, addition, building 57, Aluminum Co. of America, Lafayette, Ind., to Bedford Foundry & Machine Co., Bedford, Ind.

255 tons, bridge, contract 320, Williamson county, Texas, to Austin Bros., Dallas, Tex.

255 tons, service building, Chevrolet Motor Co., Flint, Mich., to American Bridge Co., Pittsburgh.

220 tons, additions to machine shop, Cincinnati Bickford Machine Tool Co., Cincinnati, to Austin Co., Cleveland.

220 tons, grade crossing elimination, Orchard Park, Erie county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Bero Engineering & Construction Corp., North Tonawanda, N. Y., contractor, $137,179.25; bids Oct. 2, Albany.

195 tons, factory addition, J. L. Lucas & Son Inc., Fairfield, Conn., to Porcupine Co., Bridgeport, Conn.

185 tons, manufacturing building, Standard Corrugated Case Corp., Ridgefield, N. J., to H. R. Goeller Inc., Newark.

180 tons, runway, American Foundry Equipment Co., Mishawaka, Ind., to Mississippi Valley Structural Steel Co., Decatur, Ill.

180 tons, launching ways, New York Shipbuilding Corp., Camden, N. J., to Belmont Iron Works, Philadelphia.

180 tons, factory building, Standard Corrugated Case Corp., Ridgefield, N. J., to H. R. Goeller Inc., Hillside, N. J.

175 tons, state bridges MB-1 and 4, 73-21-25, Saginaw, Mich., to Wisconsin Bridge & Iron Co., Milwaukee.

165 tons, crossings at Kettle Falls, Marcus and Powell, Wash., to Paxton & Vierling Iron Works, Omaha, Nebr.

165 tons, building addition and alterations, American Locomotive Co., Auburn, N. Y., to Seneca Engineering Co., Montour Falls, N. Y.

160 tons, bridge project 8-G-3, Saltese, Mont., for government, to Pittsburgh Des Moines Steel Co., Pittsburgh.

150 tons, magazine building, Picatinny arsenal, New Jersey, to Bethlehem Fabricators Inc., Bethlehem, Pa., through John Lowry Inc., New York; 650 tons additional to be placed for other buildings.

150 tons, Erie railroad grade crossing elimination, Athol Springs-Hamburg, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; C. B. Whitmore Co., Lockport, N. Y., contractor, $138,050.20; bids Sept. 4, Albany.

140 tons, storage garage, Boston Elevated Railway, Boston, to A. O. Wilson Structural Co., Cambridge, Mass.

140 tons, highway bridge, Hamburg, N. Y., to Bethlehem Steel Co., Buffalo, through C. B. Whitmore Co., Lockport, N. Y.

125 tons, extension to plant, Louisville Gas & Electric Co., Louisville Ky., to Louisville Bridge & Iron Co., Louisville, Ky.

125 tons, bridge, St. Regis river, Mineral

county, Montana, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

105 tons, highway bridge FAP-247-D, Bruceville, Md., to Dietrich Bros. Inc., Baltimore.

100 tons, addition to foundry building, Fairbanks, Morse & Co., Beloit, Wis., Cunningham Bros., Beloit, Wis., contractor, to Milwaukee Bridge Co., Milwaukee; bids Oct. 8.

100 tons, telephone building, Vallejo, Calif., to Golden Gate Iron Works, San Francisco.

Unstated, 760-foot steel and concrete state bridge, Medicine river, Montana; to unnamed eastern interest; W. P. Roscoe, Billings, general contractor.

Unstated tonnage, outlet works superstructure, Winsor dam, Belchertown, Mass., to West End Iron Works, Cambridge, Mass.; Chandler Construction Co., Boston, contractor.

Shape Contracts Pending

14,000 tons, crane runway, navy, Philadelphia.

12,000 tons, crane runway, navy, Portsmouth, Va.

9500 tons aircraft plant expansion, Republic Aviation Corp., Farmingdale, N. Y.; bids in to Detroit engineer.

8500 tons, aircraft plant, near Lockport, Ohio, Curtiss-Wright Corp., Paterson, N. J.; bids in.

6000 tons, heavy cast iron tunnel segments, river section only, Battery-Brooklyn tunnel, New York; bids Oct. 29, New York tunnel authority.

5420 tons, bridge over Mississippi river at Jefferson Barracks, Mo.; Sverdrup & Parcel, St. Louis, engineers; previously reported at 7000 tons.

2000 tons, additions to grandstand, Metropolitan Jockey club, Jamaica, N. Y.

1500 tons, additions to public schools. No. 40 Jamaica, 147 St. Albans, 156 Laurelton, New York; bids Oct. 29, 30, 31, to New York board of education.

1360 tons, specification 9981, shipfitters assembly shop, Puget Sound navy yard, Bremerton, Wash.; Pacific Car & Foundry Co., Seattle, low.

1300 tons, 14-story apartment, 220 Madison avenue, New York, John Lowry Inc., New York, contractor.

1000 tons, state bridge 637, Durand, Wis.

975 tons, Spokane river bridge, Stevens and Lincoln counties, Washington, for state; bids Oct. 22.

950 tons, addition to warehouse, Central Steel & Wire Co., Chicago.

925 tons, state bridge 638, Menominee, Wis.

800 tons, state bridge PSC-4775, Duane, N. Y.

800 tons, mess, recreation and dispensary buildings, naval air station Quonset Point, R. I.

750 tons, highway bridge, Schenectady, N. Y.; bids Oct. 20.

700 tons, weld shop, Harvey, Ill., Whiting Corp.

650 tons, apartment house, Joseph Perlbinder, New York.

550 tons, addition, Free synagogue, New York.

525 tons, penstock liners, Cherokee dam, Jefferson City, Tenn., Tennessee Valley authority.

518 tons, undercrossing, Santa Fe tracks, Arcadia, Calif., bids Oct. 31.

487 tons, engine repair shop, invitation 6812-41-9, Hickam Field, T. H.; Walker & Moody, Honolulu, T. H., low on general contract at $301,281.

475 tons, extension to open hearth building and crane runway, Sharon Steel Corp., Struthers, O.

465 tons, grade elimination, Cuyahoga county, Ohio, for state.

440 tons, extension to plant, Hoover Co., N. Canton, O.

304 tons, undercrossing, Sunol, Alameda county, Calif., for state; bids Oct. 30.

300 tons, H-piling, Pittsburgh Plate Glass Co., Barberton, O.; bids in.

260 tons, spare lock gates and strongback, Mississippi and Illinois river locks, for government.

250 tons, pony truss bridge, Clearfield county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 25.

239 tons, Pajaro river bridge, Santa Clara and San Benito counties, California, for state; bids Oct. 30.

210 tons, 3-span WF beam bridge and re-erection plate girder bridge, Woodford, Vt.; Ryan & Densmore, Claremont, N. H., contractor, $74,122.30; bids Oct. 11, Montpelier.

200 tons, exhibition barn, fair grounds, Wausau, Wis., for city.

200 tons, state bridge RC-40-86, Delhi, N. Y.

195 tons, state bridge 540, Babcock, Wis.

190 tons, underpass, Ray, N. Dak., for state.

170 tons, launchway girders and columns, New York Shipbuilding Corp., Camden, N. J.

160 tons, signal corps warehouse, Day-

ton, O., for war department.

142 tons, Wenatchee river bridge, Chelan county, Washington, for state; bids Oct. 22.

140 tons, additions to Canal station, Louisville Gas & Electric Co., Louisville, Ky.

135 tons, magazine buildings, etc., Picatinny arsenal, Dover, N. J., for war department.

125 tons, state bridge 699, Blue River, Wis.

125 tons, steel for Grand Coulee dam, Washington, specification 1434-D; American Bridge Co., Pittsburgh, low.

120 tons, telephone building, Chesapeake & Potomac Telephone Co., Beckley, W. Va.

115 tons, bus terminal, Central Greyhound Lines, Syracuse, N. Y.

105 tons, extension to boiler house, International Harvester Co., S. Chicago, Ill.

105 tons, office building, De Laval Steam Turbine Co., Trenton, N. J.

100 tons, ash tower, Waterside station, New York, Consolidated Edison Co.

100 tons, I-beam underpass, Huntingdon county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct.25.

100 tons, undercrossing, Spokane county, Washington, for state; bids Oct. 22.

Reinforcing

Reinforcing Bar Prices, Page 79

Pittsburgh—Prices are slightly weaker in some eastern sections, although the slippage is scattered and tonnages involved are relatively small, considering the heavy unplaced tonnage. Inquiries are active, with considerable interest centering in housing work in various sections of eastern states. Prices from Ohio westward are generally weak, with few new jobs of consequence being offered.

Cleveland—The best demand in a long time is experienced for reinforcing steel and mesh, particularly for highway and housing projects. This partially compensates for the reported winding up of large jobs in the country generally. Producers admit that prices are weak, as usual, though several comment that they are beginning to strengthen. Rarely, however, is the full price of 2.15 cents being paid, apparently. The more attractive projects here are running 200 to 400 tons each.

Chicago — Reinforcing bar market is relatively quiet, most current business being for small building construction jobs and highway work involving less than 100 tons each. A number of jobs in the 100 to 400-ton range are up for bids. These include postoffices, additions to office buildings and plant extensions.

New York—Reinforcing steel lettings are estimated at 5000 tons. Most distributors are experiencing improved demand for small lots for prompt shipment. Concrete bar prices continue to maintain strength, shading now being the exception. Mill deliveries are gradually slipping to around 60 days.

San Francisco—Movement of reinforcing bars in large lots continues quiet although numerous projects requiring from 20 to 80 or 90 tons have been sold.

Concrete Bars Compared

	Tons
Week ended Oct. 19	15,934
Week ended Oct. 12	5,705
Week ended Oct. 5	18,191
This week, 1939	9,439
Weekly average, year, 1940	9,661
Weekly average, 1939	9,197
Weekly average, Sept.	10,611
Total to date, 1939	410,978
Total to date, 1940	405,772

Includes awards of 100 tons or more.

Reinforcing Steel Awards

3000 tons, housing project, Philadelphia, Sweet's Steel Co., through Construction Corp., New York.

1250 tons, bridge substructure, Connecticut river, Hartford, Conn., to Truscon Steel Co., Youngstown, O.; A. I. Savin Construction Co., Hartford, contractor; bids Sept. 17, Hartford.

1050 grade crossing eliminations, Atlantic ave., Brooklyn, N. Y., two sections, Long Island railroad, to Carnegie-Illinois Steel Corporation, Pittsburgh, through district distributor, with Arthur A. Johnson Corp. and Necarro Corp., New York, joint contractors.

1000 tons, du Pont smokeless powder plant, Charlestown, Ind., to Bethlehem Steel Co., Bethlehem, Pa., through Colonial Supply Co., Louisville, Ky.

1000 tons, Marion housing project, Jersey City, N. J., to Joseph T. Ryerson & Son Inc., Chicago, through George Siegler Co., contractor.

700 tons, Edgewood arsenal buildings, Hartford county, Va., to Bethlehem Steel Co., Bethlehem, Pa., through Cummins Construction Co.

625 tons, state highway project, RC-40-83, Sharon-Sloansville, Schoharie county, New York, to Truscon Steel Co., Youngstown, O.; Arute Bros., Inc., New Britain, Conn., contractor, $796,313.00, bids Oct. 2, Albany.

600 tons, state highway project, RC-40-82, Malone-Duane, Franklin county, New York, to American Steel & Wire Co., New York; Lane Construction Corp., Meriden, Conn., contractor, $640,912.75, bids Oct. 2, Albany.

600 tons, Felix Fuld housing project, Newark, N. J., to Bethlehem Steel Co., Bethlehem, Pa., through Fatzler Co., Newark, N. J.

600 tons, machine gun factory, Frigidaire division, General Motors Corp., Dayton, O., to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, Chevrolet Motors service building, Flint, Mich., to Bethlehem Steel Co., through A. A. Albrecht Co., contractor.

400 tons, East River drive, Forty-first to Forty-ninth street, New York, to Bethlehem Steel Co., Bethlehem, Pa., through Reiss & Weinsier Inc., New York.

400 tons, aviation facilities, contract 4164, Coco Solo, Canal Zone, to Bethlehem Steel Co., Bethlehem, Pa.

388 tons, Pennsylvania highway, project R-55, section 6, Huntingdon county, Pa., to Bethlehem Steel Co., through L. M. Hutchinson, contractor.

350 tons, housing project, New Britain, Conn., to Truscon Steel Co., Youngstown, O., through Rathgeb-Walsh Inc., Port Chester, N. Y.

300 tons, Armour Co. plant expansion, Kansas City, Kans., to Truscon Steel Co., Youngstown, O., through Swenson Construction Co., contractor.

300 tons, Bank of America building, San Francisco, to Bethlehem Steel Co., San Francisco.

300 tons, Presidential Heights housing, New Bedford, Mass., to Truscon Steel Co., Youngstown, O., through Rathgeb-Walsh Inc.

250 tons, Frankford arsenal, Philadelphia, to Truscon Steel Co., Youngstown, O., through Henry W. Horst Co., Philadelphia, contractor.

204 tons, paint warehouse, Sherwin-Williams Co., Chicago, W. E. O'Neil Construction Co., Chicago, contractor, to Calumet Steel Co., Chicago.

200 tons, highway project, route 29, section 2D, Union county, New Jersey, to Shultz-Sickles Co., Newark; LaFera-Grecco Contracting Co., Newark, contractor; bids Oct. 4, Trenton, N. J.

200 tons, building, Viterbo college, La-Crosse, Wis., to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, Coca-Cola building, Oshkosh, Wis., to Bethlehem Steel Co., Bethlehem, Pa.

174 tons, Pennsylvania highway, project R-117, section 5, Fayette county, Pa., to Truscon Steel Co., Youngstown, O., through Midwest Construction & Asphalt Co., contractor.

165 tons, invitation 6813-41-51, air base, Alaska, to Gilmore Fabricators Inc., San Francisco.

154 tons, Pennsylvania highway, project R-359, Armstrong county, Pa., to Bethlehem Steel Co., Bethlehem, Pa., through Porterfield-Binger Co., contractor.

150 tons, Red Owl store building, Minneapolis, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, bars and mesh for ordnance building, Philadelphia, to Truscon Steel Co., Youngstown, O., through M. & L. Construction Co., Philadelphia, contractor.

150 tons, Mineral Industries building, Morgantown, W. Va., to West Virginia Rail Co., Huntington, W. Va., through Baker & Coombs, contractor.

138 tons, state highway project, RC-40-81 Amenia-Sharon Station, Dutchess county, New York, to Wickwire-Spencer Steel Co., New York; John Arborio, Inc., Poughkeepsie, N. Y., contractor, $183,737.70, bids Oct. 2, Albany.

130 tons, building for Atlantic Refining Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa., through Lauter Construction Co., Philadelphia, contractor.

121 tons, bureau of reclamation, invitation 21, 190-A, Falk, Idaho, to Pacific States Steel Co., San Francisco.

105 tons, Cass river bridge, Caro, Mich., to Taylor-Gaskin Inc., Detroit, through A. T. Barnes contractor.

105 tons, navy yard, Philadelphia, to Carroll-McCreary Co., Brooklyn, $4338.51.

Reinforcing Steel Pending

1400 tons, Panama Canal, schedule 4450; bids Oct. 29.

1130 tons, cold storage building, specification 9974, naval fleet supply depot, Oakland, Calif.; K. E. Parker, 135 South Park street, San Francisco, low on general contract at $595,600.

820 tons, final section Outhwaite Homes, Cleveland, James McHugh Sons Inc., Chicago, low; bids Oct. 10.

710 tons, federal housing project in Cincinnati, general contractor, J. & E. Warm Co., Cincinnati.

550 tons, housing project, New Haven, Conn.

500 tons, Bellevue square housing, Hartford, Conn.

500 tons, U. S. veterans hospital, Marion, Ill.; Ring Construction Co., Minneapolis, low on general contract.

414 tons, Clayton, Mo., bridge over Mississippi river near Jefferson Barracks, Mo.; bids Oct. 28; Sverdrup & Parcel, St. Louis, engineers.

400 tons, Lindberg boulevard bridge, St. Louis.

392 tons, United States postoffice, Cairo, Ill., Henke Construction Co., Chicago, contractor.

350 tons, naval reserve buildings, Washington; Charles Tompkins Co., contractor.

348 tons, administration, cafeteria and heating plant, specification 9973, naval fleet supply depot, Oakland, Calif.; bids opened.

300 tons, Edgewood housing, Akron, O.; bids Oct. 23.

300 tons, Norfolk & Western railway yard improvements, Roanoke, Va.

265 tons, Panama, schedule 4406, U. S. Steel Export Co., Washington, low; bids Oct. 14, Washington.

260 tons, housing project, Danville, Ill.; George Sollitt Construction Co., contractor.

250 tons, bridges, R-2015-34, Putnamville, Ind.; R. McCalman, contractor.

237 tons, Ohio state highways, Jackson county, Project 302; bids Oct. 19.

225 tons, mesh, state highway project, Tioga county, New York; bids in Oct. 16, Albany.

210 tons, grade elimination, PSCC 4775, Schenectady, N. Y.; bids Oct. 16.

200 tons, Chicago subway S-10-D, Chicago; bids Oct. 24.

200 tons, United States postoffice, Charleston, W. Va.; T. G. Eagen Engineering Co., low.

200 tons, Illinois Bell Telephone Co. building, Chicago.

168 tons, Pajaro river bridge, Santa Clara and San Benito counties, California, for state; bids Oct. 30.

150 tons, Westinghouse Electric & Mfg. Co., light fixture plant, Cleveland; Austin Co., contractor.

145 tons, undercrossing, Arcadia, Los Angeles county, California, for state; bids Oct. 31.

138 tons, Ohio state highways, Trumbull county, Project 304; bids Oct. 19.

135 tons, underground magazines, Hamilton Field, Calif.; Louis C. Dunn, Maonadock building, San Francisco, low on general contract at $107,974.

130 tons, Qunnipiac housing, West Haven, Conn.

114 tons, improvement Los Angeles river between Randolph and Stewart streets, Los Angeles; bids opened.

108 tons, addition to office building, A. C. Nielson Co., Chicago.

100 tons, Consolidated Water Power &

Pump Co., Wisconsin Rapids, Wis.

100 tons, Cuyahoga county, Ohio, project 301, SHD; bids Oct. 19.

Unstated tonnage, Lincoln Park housing, Columbus, O.; bids Oct. 30.

Pig Iron

Pig Iron Prices, Page 80

Pittsburgh—Although there has been little change there is a growing conviction that before the winter is over a substantial shortage in merchant iron can be expected. For that reason some buyers have been increasing commitments and are making plans to speed deliveries as much as possible to secure protection against such possibility.

Cleveland—Iron producers and consumers watch closely advances in steel scrap prices. The New York Central recently secured $22.50 per ton for melting steel scrap, which is equivalent to $23, delivered, on basic pig iron. Normally scrap should be some $4 per ton cheaper, iron men say. Possibility of pig iron price advance is recognized, though regarded as improbable for the next few weeks, especially since the scrap trade has promised government bodies to make no more scrap advances. Some look for higher wages and hence higher iron prices. Buying is fairly brisk but not commensurate with finished steel. Foundry melt is increasing gradually. Though some producers will sell only to regular customers, selling in the main is still free.

Boston — Substantially heavier melt with prospect of continuation stimulate buying and shipments. Likelihood of higher prices, possible shortages or delayed deliveries also help demand. Shipments are on the up trend against fourth quarter commitments. Spot buying is also appearing from melters with moderate reserve stocks.

Philadelphia—Pig iron shipments continue ahead of September, with active deliveries indicated for the remainder of the quarter on tonnage under contract. Foundry operations are increasing moderately but a number of melters are able to accommodate additional business. High scrap prices are encouraging the use of a larger share of pig iron in the melt.

Buffalo—Even though demand continues to grow and indications point to a complete clearance by the end of the year of heavy fourth quarter bookings, producers appear less apprehensive over supplies than consumers and see no reason for placing restrictions on deliveries.

Cincinnati — The melt is holding close to 70 per cent of foundry capacity and the slight increase in shipments of pig iron this month may be traced to desire for larger inventory. Spot orders are more numerous although principal consumers are well covered by contracts for quarter needs.

St. Louis—Interest in pig iron continues to grow, and while so far there has been no hitch in regularity of shipments, blast furnaces are apparently preparing to take care of regular customers first. According to sellers a number of customers failed to make full provision for fourth quarter and these have been purchasing substantial tonnages. On the other hand, many large operations are amply supplied for this quarter and well into next year.

Scrap

Scrap Prices, Page 82

Pittsburgh—Prices are unchanged here, with some mill buying being done in almost every grade at the quoted range. In other districts, however, railroad specialties have weakened slightly, and there has been a decline in interest in open-hearth grades. Some factors are inclined to believe the reaction is psychological, based largely on the reports of hearings being held in Washington. It is significant that few, if any, local factors are short of the market, in spite of the apparent lack of interest on the part of mills.

Cleveland — Trading is quiet as dealers await clarification of prices in view of recent Washington conferences. Following recent railroad closings cast and malleable grades have advanced 75 cents to $1. Valley prices are said to be soft but quotations here are firm.

Chicago—Quiet rules the steel and iron scrap market here, steelmaking grades being unchanged. A small tonnage of No. 1 heavy melting steel was sold recently at $20 after that figure had been refused previously. Some specialty items show strength, but prices generally are unchanged.

Boston—More district foundries are buying scrap or taking better shipments. Tonnages bought are conservative but the aggregate is unchanged to heavier. Shipments to eastern Pennsylvania are fair. Prices are firm with few minor rises on cast grades, turnings and other items.

New York—Domestic shipments continue substantial with scattered new buying by steel works and foundries tending upward. Export prices are unchanged with buying somewhat curtailed due to lack of cargo space. Domestic quotations are steady but inclined upward on a few grades, rails for rolling, steel shafting and stove plate being slightly stronger. Wrecking of buildings at world's fair is expected to aggregate close to 30,000 tons but not all will go to scrap as some will be used again for miscellaneous construction. Board of

transportation taking bids Oct. 28 on 690 tons steel scrap, including car wheels, rails and miscellaneous.

Philadelphia—A strong and relatively stable scrap market continues. Some mills are inactive in buying, apparently they hope several recent developments will contribute to easier prices but sustained demand in filling contracts and absence of heavier offerings are holding principal steelmaking grades firm. Likelihood of somewhat lighter supplies is seen with approach of winter.

Buffalo—Mixed tendencies appear to be creeping into the market. Washington discussions over prices are having some effect on sentiment. The market displays a strong tone with business restricted to minor tonnage. With the close of the navigation season near receipts from upper lake areas are expanding and competing with local supplies.

Cincinnati—Dealers in iron and steel scrap have raised bids 25 cents on most items and otherwise are aggresive in search of tonnage. Mills are buying more freely as a reflection of continued high operations. Consumer pressure on prices has relaxed somewhat.

St. Louis—Steel and iron scrap is quiet as contrasted with recent weeks and prices, with a few minor exceptions, are unchanged. Buying activity is confined almost exclusively to dealers, covering sales. Shipments are coming in more freely.

San Francisco—No further weakness is noted in the scrap market and No. 1 heavy melting steel holds at $13.00 to $13.50 a net ton, f.o.b. cars metropolitan areas of Los Angeles and San Francisco while No. 2 is quoted at $12.00 to $12.50 a net ton. The flow of scrap remains strong and open-hearth producers continue to buy in fairly heavy lots.

Warehouse

Warehouse Prices, Page 81

Cleveland—Buying of structurals and plates features, which is unusual for this area. Mills no longer want small tonnage orders, which diverts sales to the retailers. Prices generally are firm, even galvanized sheets being relatively strong.

Chicago—Sales continue unabated, with prospects that October will total considerably heavier than September. Alloy and certain grades of high carbon bars are in best demand. The buying volume is made up of orders from all directions, with no field outstanding.

New York—Demand for steel from warehouse is brisk. While trucking strikes in the metropolitan district have been a retarding influence, jobber sales are fully up to the heavy volume of last month. Inquiry is diversified and orders numerous, tending larger.

Philadelphia—Business is heavy from a wide variety of consumers, buying being substantially better than a month ago. Some distributors report volume at the limit of their ability to handle comfortably. Galvanized sheets have been advanced 25 cents to 4.25c for 25 bunbles and over 4.50c for ten to 25 bundles, and 4.75c for less than ten bundles.

Iron Ore

Iron Ore Prices, Page 82

Cleveland—That iron ore buying is not yet over for the season is attested by an inquiry for 20,000 tons. Ore operators are predicting that 10,000,000 tons will have been brought down the lakes during October and 5,000,000 tons during November. Shippers have been scanning records to determine when the lakes freeze and navigation ceases. In 1939 the Soo canal closed Dec. 14. The earliest closing in the present century was Dec. 7, 1932; the latest, Dec. 26, 1923. At present no shortage of ore at lower lake ports is in prospect.

The Great Lakes ore fleet remains 100 per cent active, as of Oct. 15, the same condition as a month ago, according to C. C. Lindeman, statistician with M. A. Hanna Co. Thus the 22 companies are operating their total of 296 vessels completely.

Consumption of iron ore by furnaces declined slightly during September, doubtless because of the shorter month, amounting to 5,671,918 tons as against 5,700,743 tons in August, according to the Lake Superior Iron Ore association. August, 1940, consumption had been the highest for any month since August, 1929.

Cumulative consumption for 1940, through September, has been 44,228,922 tons as against 28,074,239 tons for the corresponding period of last year, an increase of 57 per cent.

Stocks of ore at furnaces and on Lake Erie docks Oct. 1 totaled 37,090,053 tons as against 32,934,665 tons a month ago, and 35,853,173 tons a year ago.

Steel in Europe

Foreign Steel Prices, Page 81

London—(*By Cable*)—All steelworks in Great Britain are booked to the end of the year and some have contracts reaching well into 1941. Raw material and semi-finished position is satisfactory, enabling further record output. Ore supplies from the Mediterranean continue in good volume and are supplemented by some South African material. British works have taken a contract from South African railroads for locomotive boilers. South American inquiries for tin plate are in larger volume. It is believed prices of steel will be increased as a result of conferences now going on.

Nonferrous Metals

New York—Offerings of copper and zinc for nearby delivery were extremely tight last week while those of lead were restricted. Copper and lead prices advanced while those of zinc remained firm.

Copper—Small independent fabricators had difficulty in buying copper at almost any price, although small tonnages were obtained in the custom smelter and resale markets at 13.00c, Connecticut. Fourth quarter metal was almost impossible to obtain, even from leading mine producers who continued to allocate sales to regular customers at 12.00c. A survey by the bureau of mines revealed that supplies for the last quarter of this year exceed consumers' requirements by 81,000 tons. Export copper sold at 11.00c, f.a.s. New York, and may rise to the producers' level.

Lead—Prices advanced ¾-cent to the basis of 5.35c, East St. Louis, in Thursday. Weekly sales continue at a rate in excess of production, indicating that producers have reduced sharply their reserve stocks.

Zinc—With galvanized sheet output at 80 per cent, a new high for recent years, shipments are maintaining an excellent rate. Sellers have been unable to satisfy demand fully but have attempted to cover all urgent needs. Prime western held firm at 7.25c, East St. Louis.

Tin—Easing in the Far Eastern political situation tended to relieve buying pressure and prices eased gradually, indicating that the market again may seek the Metals Reserve Co.'s 50-cent buying price. Straits spot closed at 51.62½c, a drop of ¼-cent for the week.

Nonferrous Metal Prices

Oct.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
12	12.00	12.00	11.75	51.87½	51.25	5.25	5.10	7.25	18.00	14.00	35.00
14	12.00	12.00	12.12½	51.87½	51.00	5.25	5.10	7.25	18.00	14.00	35.00
15	12.00	12.00	12.12½	51.87½	50.80	5.25	5.10	7.25	18.00	14.00	35.00
16	12.00	12.00	12.12½	51.75	50.62½	5.50	5.35	7.25	18.00	14.00	35.00
17	12.00	12.00	12.50	51.62½	50.50	5.50	5.35	7.25	18.00	14.00	35.00
18	12.00	12.00	12.50	51.62½	50.50	5.50	5.35	7.25	18.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.23
Copper, hot rolled	20.62
Lead, cut to jobbers	7.75
Zinc, 100 lb. base	12.50

Tubes

High yellow brass	21.98
Seamless copper	21.12

Rods

High yellow brass	14.76
Copper, hot rolled	17.12

Anodes

Copper, untrimmed	17.87

Wire

Yellow brass (high)	19.48

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	8.00-8.25
Cleveland	8.62½-9.12½
Chicago	7.75-8.25
St. Louis	8.37½

Heavy Copper and Wire

New York, No. 1	9.62½-9.87½
Cleveland, No. 1	9.37½-9.87½
Chicago, No. 1	9.37½-9.62½
St. Louis	9.37½

Composition Brass Turnings

New York	7.62½-7.87½

Light Copper

New York	7.62½-7.87½
Cleveland	7.37½-7.87½
Chicago	7.37½-7.62½
St. Louis	7.37½

Light Brass

Cleveland	4.12½-4.37½
Chicago	5.25-5.50
St. Louis	4.87½

Lead

New York	4.75-4.85
Cleveland	3.75-4.00
Chicago	3.85-4.10
St. Louis	3.50-3.75

Zinc

New York	3.87½-4.12½
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum

Mis., cast, Cleveland	9.25-9.50
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.25
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.25
Standard No. 12 aluminum	14.50-15.00

Coke Oven By-Products

Coke By-Product Prices, Page 79

New York—Demand for distillates is active and slightly improved. Production is heavy, but current output is moving into consuming channels, although benzol has been inclined to lag. Two degree toluol is unchanged at 27.00c per gallon with nitration grade quoted 28.50c. Larger consumers are contracting for 1941 needs on the latter at open prices, subject to quotations at the time of shipment, but not to exceed 30.00c. Chemical and explosive requirements are heavier. Phenol is fairly active with plastic and resin needs maintained. Industrial inquiry for naphthalene is slightly stronger, but buying for household distribution is seasonally light.

Ferroalloys

Ferroalloy Prices, Page 80

New York—Shipments of ferromanganese this month have been consistently higher than in the corresponding period in September, due not only to increased steelmaking operations, but to inroads in stocks ordered before the price advance July 1. Prices are firm at $120, duty paid, tidewater, with equal steadiness in spiegeleisen, which is quotable at $36, Palmerton, Pa., on 19 to 21 per cent material and $49.50 on 26 to 28 per cent. Other ferroalloy prices also are unchanged.

Equipment

New York—With assembly lines filled and most shops operating on 24-hour schedules, orders continue to swamp machine tool builders. On a voluntary priority basis as to shipment, deliveries extend beyond next year on some units. The machine tool industry itself is No. 1 on the priority list with builders and dealers making every possible effort to supply aircraft engine, government shops and plants engaged in the defense program. Orders for rapidly expanding aircraft production are in, but hundreds of tools for tank assembly and other armaments, many of which require additional manufacturing space, are being negotiated. Production facilities of the machine tool industry are steadily being enlarged, but bottlenecks loom to an added degree on some units, including horizontal boring mills.

Seattle—Active demand for equipment for heavy construction projects is reported, jobs in Alaska calling for extensive purchases by both government agencies and private contractors.

Construction and Enterprise

Ohio

CLEVELAND — Federal Foundry Supply Co., 4600 East Seventy-first street, Louis H. Heyl, vice president, will build two additions, 20 x 80 foot-storage shed and 45 x 60-foot enclosed storage building. Harlen E. Shimmin, 1720 Euclid avenue, is architect.

CLEVELAND—Triplex Screw Co., 5317 Grant avenue, Cuyahoga Heights, A. F. Weber, president, is adding about 18,000 square feet of warehouse space in its third enlargement in three years. Product is cap screws.

■ **Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 91 and Reinforcing Bars Pending on page 93 of this issue.**

CLEVELAND—Towmotor Co., 1226 East 152nd street, Lester M. Sears, president, manufacturer of industrial trucks and tractors, is starting its second plant expansion for this year, a one and two-story office and manufacturing addition 45 x 150 feet. C. B. Rowley & Associates, Keith building, are architects.

CLEVELAND—Marquette Metal Products Co., 1145 Galewood drive, Herbert Gleitz, president, will build an addition 65 x 200 feet, costing $25,000, to increase space for manufacture of new products. Cleveland Construction Co., Terminal Tower, is contractor.

CLEVELAND—Apex Electrical Mfg. Co., 1070 East 152nd street, is building addition to storage space with 3500 square feet. Clarence S. Frantz is president.

CLEVELAND — Cuyahoga Foundry Co., J. W. Proshek, president, 4530 East Seventy-first street will build a foundry, one-story 80 x 116 feet, to cost about $40,000. T. Badowski, 7100 Broadway, is architect.

CLEVELAND—Mor-Flo Heater Corp., 2176 East Seventy-sixth street, is increasing capital stock to provide additional working funds and has filed incorporation papers. Arthur L. Abt will remain as president.

CLEVELAND—Yoder Co., manufacturer of heavy machinery, 5500 Walworth avenue, plans taking up production of new lines for the defense program. Yoder Sales Co. is being organized to handle these sales, by Harvey O. Yoder and other officers of Yoder Co. A plant erected in 1930 but never used, is available for production.

CLEVELAND—Chase Brass & Copper Co., 1155 Babbitt road, Walter L. Smith, manager, will build chemical and research laboratory with about 6000 square feet on one floor. Austin Co., 16112 Euclid avenue, is contractor and cost will be about $40,000.

CLEVELAND—Bailey Meter Co., 1015 Ivanhoe road, is rearranging plant interior to increase production, by installing two steel balconies.

ELYRIA, O.—Ridge Tool Co., C. H. Ingwer, president, Ridgeville, O., plans erection of new and larger plant, costing $100,000.

KENTON, O.—Ohio Machine Tool Co., has let contract for one-story 50 x 100-foot assembly building to Austin Co., 16112 Euclid avenue, Cleveland, at about $40,000.

MANTUA, O.—Briggs Steam Tractor Co., Carl R. Briggs and John Cunningham, Eastland avenue, Akron, O., recently organized, has plans and will take bids soon on 40 x 200-foot plant for manufacture of tractors.

YOUNGSTOWN, O.—Youngstown Steel Door Co., Mahoning avenue, is building a two-story office addition 30 x 40 feet and a one-story paint shop, at cost of about $45,000.

Connecticut

DEVON, CONN.—Connecticut Light & Power Co., C. L. Campbell, president, 49 Leavenworth street, Waterbury, Conn., will build a power plant addition to house a 43,000-KW turbogenerator, substations and power lines. Cost about $4,000,000.

FAIRFIELD, CONN.—J. L. Lucas & Sons Inc., 3 Fox street, Bridgeport, Conn., will build a one-story 200 x 500-foot machine manufacturing plant costing about $150,000. L. F. Caproni, 1221 Chapel street, New Haven, Conn., is engineer.

HAMDEN, CONN.—Botwinik Bros., 67 Water street, New Haven, Conn., will build a one-story 105 x 725-foot machine tool plant on Welton street, costing about $200,000. C. H. Abramowitz, 52 Goffe Terrace, New Haven, is engineer.

NEW BRITAIN, CONN. — Stanley Works, 195 Lake street, has let contract for one-story 120 x 360-foot addition on Curtis street to Harrison & Downes, West Main street, at cost of $95,000. M. Baldeari, Linwood street, is engineer.

PLAINVILLE, CONN.—Standard Steel & Bearings Co. Inc., Woodford avenue, will build a plant addition costing $40,000.

Massachusetts

SPRINGFIELD, MASS.—Van Norman Machine Tool Co., which had been considering purchase of National Equipment Co. plant, has decided instead to build a plant addition on Wilbraham avenue to allow increased production.

New York

ELMIRA, N. Y.—Eclipse Machine division, Bendix Aviation Corp., W. L. Grath, president, Eighteenth street and Oakwood boulevard, will build a one-story 400 x 400-foot plant addition, a powerhouse and sewage disposal plant costing $200,000. Argonaut Realty Division General Motors Corp., Detroit, architects.

JAMESTOWN, N. Y. — Jamestown Metal Equipment Co., O. A. Lenna,

president, 1088 Allen street, will build a one-story 240 x 700-foot plant costing $250,000 to $350,000. E. B. Card, care owner, is chief engineer.

NEW YORK—R. Hoe & Co. Inc., 910 East 138th street, will build a welding plant on Locust avenue, general contract to Brown & Matthews Inc., Chanin building, at about $40,000.

ROCHESTER, N. Y. — Consolidated Machine Tool Corp., 565 Blossom road, will build additions, three-story 140 x 160 feet and one-story 30 x 80 feet. General contract has been let to A. Friederich & Sons Co., 710 Lake avenue. Cost estimated at $100,000. J. F. Ancona, 311 Alexander street, is engineer.

New Jersey

BRIDGETON, N. J.—Owens Illinois Glass Co. has let general contract for warehouse and plant extension to Hughes Foulkrod, 1505 Race street, Philadelphia, at cost of about $100,000.

HARRISON, N. J.—Worthington Pump & Machinery Corp., 40 Worthington avenue, will build a one-story machine shop. H. Lindenkohl, 40 Worthington street, is engineer.

NORTH BERGEN, N. J.—American Air Compressor Corp., 558 Hamilton avenue, Brooklyn, N. Y., will build a one-story 55 x 100-foot plant on Dell avenue. General contract has been awarded to J. F. Mitchell Inc., 40 Clinton street, Newark, N. J.

Pennsylvania

FRANKLIN, PA.—Plant of Franklin Engineering & Mfg. Co. has been bought by Myron I. Arms, former president of Aetna-Standard Engineering Co., Youngstown, O. Name will be changed to Arms-Franklin Co. Company manufactures equipment similar to Aetna-Standard and line of processing machinery for steel plants will be added.

LESTER, PA.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., plans plant expansion for manufacture of turbines. Buildings estimated to cost $4,000,000 and equipment $5,000,000.

Michigan

DETROIT—Eureka Tool & Die Co., 3430 East Fort street, has plans by Lyndon & Smith, 500 Murphy building, Highland Park, Mich., for a one-story 50 x 100-foot plant extension costing $40,000. (Noted Oct. 14.)

DETROIT—DeLuxe Die Works, 18800 Hawthorne street will build a one-story 80 x 215-foot plant for the manufacture of dies, at cost of about $44,000.

Illinois

CHICAGO—George M. Lorenz Steel Co., 2400 West Madison street, has been incorporated with 400 shares common stock, $50 par. Correspondents are D'Ancona, Pflaum & Kohlsaat, 33 North LaSalle street, Chicago.

CHICAGO—Bauwens Machine Co. Inc., 4118 North Greenview avenue, has been incorporated with 100 no par shares, by William Holzinger, 208 North Wells street, and associates.

CHICAGO—Charles Bruning Co. Inc., manufacturer of drafting and engineering supplies and equipment, will double plant capacity by one and two-story addition to plant at 4700 West Montrose avenue, at estimated cost of $278,000. B.-W. Construction Co., is contractor.

DECATUR, ILL.—A. W. Cash Valve Mfg. Co., 616 North Water street, will build a one-story brick plant addition costing $65,000.

FRANKLIN PARK, ILL.—Thompson Wire Co., Franklin Park, will build a one-story addition at 9470 King street, [illegible]act to Austin Co., 510 North Dearborn street, Chicago. Estimated cost $40,000.

LA GRANGE, ILL.—Stainless Steel Products Corp., 120 West Calendar avenue, has been incorporated with 500 no par shares, by Arthur W. Sprague, 105 West Monroe street, Chicago, and associates.

Indiana

ELWOOD, IND. — National Aircraft Corp. will remodel old glass plant and make additions on an 11-acre tract on North Ninth street, costing $60,000 or more with equipment. H. H. Tucker, Rose Aviation Co., 45 West Forty-fifth street, New York, is engineer.

INDIANAPOLIS — Schwitzer-Cummins Co., 1125 Massachusetts avenue, will remodel and extend its plant and install equipment for manufacture of artillery ammunition components, at cost of $50,000 or more.

MT. VERNON, IND.—Superior Oil Co., Evansville, Ind., will build a 20 x 30-foot floating dock, connecting pipelines and storage tanks on Ohio river here, at cost of $25,000.

Alabama

CHICKASAW, ALA.—Gulf Shipbuilding Corp. has government allocation of $2,500,000 for rehabilitation of ways, shops, buildings, cranes and other equipment.

GADSDEN, ALA.—Rust Engineering Co., Martin building, Birmingham, Ala., has contract for $6,000,000 munitions plant in Gadsden area, to be operated by Walter Hawley, of Lansdowne Forging Co., Philadelphia. War department and national defense commission have approved project.

SHEFFIELD, ALA.—Reynolds Metals Co., M. M. Caskie, vice president, Federal Reserve Bank building, Richmond, Va., has selected site here for erection of aluminum reduction plant with 60,000,000 pounds annual capacity. Company has RFC loan of $15,800,000.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, will open bids as follows: Oct. 22, schedule 3580, motor-driven nibbling machine for Portsmouth, N. H.; schedule 3601, two forging presses for Philadelphia and South Charleston, W. Va.; eight motor-driven geared head engine lathes for Newport, R. I.; schedule 3629, fifteen motor-driven engine lathes for South Charleston, W. Va.; Oct. 25, schedule 3569, motor-driven pipe threading machine for Mare Island, Calif.; schedule 3654, two motor-driven round column upright drilling and tapping machines for Philadelphia; schedule 3608, four motor-driven turret lathes and equipment for Newport, R. I.; Oct. 29, schedule 3566, seven motor-driven press brake machines for Norfolk, Va., and Charleston, S. C.; Nov. 1, schedule 3626, motor-driven internal cylinder grinding machine for ship delivery.

Virginia

NEWPORT NEWS, VA. — Newport News Shipbuilding & Dry Dock Co. has government allocation of $14,000,000 for shipways, pier, cranes, power plant, machine shop and other equipment.

Kentucky

LOUISVILLE, KY.—Reynolds Metals Co., William G. Golden, vice president, will build a one and two-story building at Fourth and K streets, for the manufacture of tubing and special airplane sections, at cost of $200,000, including equipment.

Georgia

ATLANTA, GA.—Westinghouse Electric & Mfg. Co., 426 Marietta street N. W., will call bids soon for office, manufacturing building and warehouse on Forrest road. Steel bids about Oct. 15.

Arkansas

BATESVILLE, ARK.—Arkansas Manganese Mining Co., J. Fred Livingston, president, is considering erection of $500,000 beneficiating plant in or near Bates-

ville. Company has mining field of 1000 acres.

LITTLE ROCK, ARK. — Southwest Compressed Tin Co., Fred Venner, president, 3601 Hill road, will erect $30,000 plant on East Fourth street, North Little Rock. Will install 24-ton hydraulic press to compress sheet metals into bales.

Wisconsin

NEENAH, WIS.—Neenah Foundry Co. plans foundry addition and extensive improvements to plant.

Minnesota

MANKATO, MINN.—Mankato Ornamental Iron Co. has been established at 152 Shadywood avenue, by S. E. Carlstrom, to manufacture wrought iron rails, pipe rails, grilles, steel stairs, bronze tablets and similar products.

MINNEAPOLIS — Warner Mfg. Co., manufacturer of wallpaper tools and metal scaffolding equipment, is building a one-story plant addition.

ST. PAUL—Auto Engine Works Inc., J. D. Mooney, president, has awarded general contract to Madsden Construction Co., for a one-story plant addition 50 x 160 feet. Henry E. Waldron, St. Paul building, is architect.

TYLER, MINN.—REA has allocated $132,000 to Lyon-Lincoln electric co-operative, Sigvald C. Martensen, superintendent, to finance 185 miles rural transmission lines to serve 388 customers.

WASECA, MINN.—E. F. Johnson Co., manufacturer of radio transmitting equipment, has started erection of one-story plant 60 x 115 feet. E. H. Schmidt & Co., Coughlan building, Mankato, Minn., are architects.

North Dakota

MINOT, N. DAK.—Drawz Mfg. Co. has been organized to manufacture coal stokers especially designed for lignite coal produced in North Dakota.

South Dakota

WHITE RIVER, S. DAK.—Village, B. R. Sawyer, clerk, plans waterworks construction, including steel tower and 50,000-gallon tank, pumping plant and mains. Bond issue may be planned to cover cost. Dakota Engineering Co., 313 Western building, Mitchell, S. Dak., is consulting engineer.

Nebraska

LINCOLN, NEBR.—White Foundry Co. is having plans prepared for rebuilding of foundry recently damaged by fire.

OMAHA—Omaha Steel Works, Karl E. Vogel, vice president and general manager, plans erection of two factory buildings to provide capacity for a government contract for artillery ammunition components.

Iowa

BLOOMFIELD, IOWA—REA has allotted $201,000 to Southern Iowa electric co-operative, W. H. Yates, president, for 710 miles rural transmission lines to serve 550 customers.

CRESCO, IOWA — REA has allotted $144,000 to Howard county electric co-operative, E. G. Skarshoug, superintendent, for 147 miles rural transmission lines to serve 366 customers.

DES MOINES, IOWA—Iowa Packing Co., H. J. Nelson, president, has let general contract to A. H. Neumann & Bros. Inc. for a power plant addition to cost about $60,000, including equipment.

DUBUQUE, IOWA—Klauer Mfg. Co., manufacturer of corrugated metal culverts, metal building products and rotary snow plows, has started construction of a two-story plant addition.

DUBUQUE, IOWA—Dubuque Packing Co. has let general contract to William L. Yokom for a packing plant addition to cost about $250,000. Henschien, Everds & Cromble, 59 East Van Buren street, Chicago, are engineers.

GLIDDEN, IOWA—Village council, Eugene Merenoss, clerk, will open bids Nov. 4 for improvements to municipal light and power plant, including addition to power plant of a diesel engine generating unit and forced draft cooling tower. A. S. Harrington, Baum building, Omaha, is engineer.

OSCEOLA, IOWA—REA has allotted $109,000 to Farmers' mutual electric co-operative, A. F. Klein, superintendent, for 115 miles rural transmission lines to serve 300 customers.

ROCK RAPIDS, IOWA—REA has allotted $97,000 to Lyon rural electric co-operative, John A. DeWild, superintendent, for 121 miles rural transmission lines to serve 298 customers.

Arizona

TEMPE, ARIZ.—Salt River Valley Water Users' Association, H. J. Lawson, general superintendent and chief engineer, Phoenix, Ariz., is considering plans for a generating plant at Tempe, at cost of about $2,000,000.

California

BURBANK, CALIF.—Bendix Aircraft Corp. will build a second-story addition 21 x 140 feet to its plant at Union Air Terminal at cost of $11,000.

BURBANK, CALIF.—Lockheed Aircraft Corp., 1705 Victory place, will build an assembly building, No. 7, 200 x 319 feet.

LONG BEACH, CALIF.—Taylor Airphone Products Co. Inc. has been organized with $200,000 capital by Moulton B. Taylor and associates. J. M. Levy, Times building, Los Angeles, is representative.

LOS ANGELES—Metal Fabricators Inc. has been incorporated with 2500 shares no par stock. Sidney K. Lindent, 1210 Taft building, Los Angeles, is representative .

LOS ANGELES—National Metalizing Co. has been incorporated with $75,000 capital by H. W. Hord, Inglewood, Calif., and associates.

LOS ANGELES—Aircraft Tools Inc., 1609 East Slauson avenue, will build a machine shop 90 x 128 feet, costing $15,000.

Washington

BELLINGHAM, WASH.—Puget Sound Pulp & Timber Co. has given general contract to Howard S. Wright & Co., Seattle, for expansion to increase capacity 50 per cent. Buildings include 80 x 240-foot machine shop addition, 40 x 72-foot digester plant, 28 x 40-foot boiler room addition, two acid towers and two sulphur silos. Buildings estimated to cost $125,000 and equipment $1,400,000.

Canada

HAMILTON, ONT.—National Steel Car Corp. Ltd., Kenilworth avenue, is taking bids on a 250-foot addition to its plant.

KINGSTON, ONT.—Canadian Locomotive Works Ltd., Ontario and Johnson streets, has let general contract to E. G. M. Cape & Co. Ltd., 620 Cathcart street, Montreal, for a $250,000 plant addition to be equipped for munitions manufacture.

LEASIDE, ONT. — Sangamo Electric Co. Ltd., 183 George street, Toronto, will build plant on Eglinton avenue. George Lawrence is president.

OTTAWA, ONT.—C. D. Howe, minister of munitions and supply, plans a plant to be erected in southern Ontario for production of special alloy steels for gun barrels, artillery equipment moving parts and other military needs.

MONTREAL, QUE. — Canadian Industries Ltd., Montreal, is having plans prepared for a plant in Ontario, to cost about $2,500,000.

MONTREAL, QUE.—Crane Ltd., 1170 Beaver Hall Hill, has given general contract to Davidson-Grant Construction Co., 630 Dorchester street West, for $20,000 plant addition.

Employment Service

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$2,500 to $25,000

This thoroughly organized advertising service of 30 years' recognized standing and reputation, carries on preliminary negotiations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been $2,500 or more, send only name and address for details. R. W. Bixby, Inc., 110 Delward Bldg., Buffalo, N. Y.

Positions Wanted

PLANT OR GENERAL MANAGER; 25 years experience light to medium metal industries also foundry. Capable engineer, alert and progressive manager seeks negotiations with live moderate size industry. Protestant, married, age, 45. You may have the facts, there is no obligation. Address Box 334, STEEL, Penton Bldg., Cleveland.

TWENTY YEARS EXPERIENCED STRUCtural and plate shop, superintendent. Seeking position either as superintendent, general foreman or estimating sales engineer. Moderate Salary until proven results. Address Box 335, STEEL, Penton Bldg., Cleveland.

POSITION WANTED — SALESMAN OF machine tools, accessories, or metal working equipment. Fourteen years experience this field. Willing go anywhere. Age thirty-five, married. Employed at present. Definitely not afraid to work. Box 324, STEEL, Penton Bldg., Cleveland, O.

SUPERVISOR: STAINLESS SEAMLESS tube fabricator seeks connection. Wide experience in cold drawing stainless. Alloy and carbon steel tubing. Lower production costs guaranteed through use of latest methods. Address Box 331, STEEL, Penton Bldg., Cleveland.

For Sale

FOR SALE—ALL MACHINERY IN THE foundry formerly operated by the Conemaugh Sanitary Mfg. Co., Blairsville, Pa., consisting of foundry, enameling, pattern and machine shop equipment, compressors, cranes, hoists, motors, transformers and many other items. Land and buildings also available. Wire, phone or write Mr. M. L. Rankin at above plant.

EXPAND

YOUR REPRESENTATION . . .

An advertisement here puts you in touch with trained, efficient, reliable men looking for new lines. Write STEEL, Penton Bldg., Cleveland, O.

All classifications other than "Positions Wanted," set solid, minimum 50 words, 5.00, each additional word .10; all capitals, minimum 50 words, 6.50, each additional word .13; all capitals, leaded, minimum 50 words 7.50, each additional word .15. "Positions Wanted," set solid, minimum 25 words 1.25, each additional word .05; all capitals, minimum 25 words 1.75, each additional word .07; all capitals, leaded, minimum 25 words 2.50, each additional word .10. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge.

Classified pages are 3 columns, each column 2¼ inches wide.

Forms close Wednesday preceding publication date.

Accounts Wanted

MANUFACTURERS' AGENT ESTABlished in Chicago industrial area, now general U. S. selling agent of seasoned line in milling machinery field, desires representation soundly engineered machine tool of broad applicability to combine with present active sales campaigns. Modern production tools or productive materials also considered. Address Box 328, STEEL, Penton Bldg., Cleveland.

ESTABLISHED MANUFACTURER'S REPresentative Pittsburgh area desires full or part time account. Prominent Office. Engineer. Acquainted manufacturers, refineries, utilities. Address Box 329, STEEL, Penton Bldg., Cleveland.

Help Wanted

SALESMAN BY SEAMLESS TUBE AND Pipe mill. Thirty years or younger. Technical college training preferred with some steel product sales experience. Supply full particulars, experience and training by letter in own hand writing, with recent photograph. Address Box 317, STEEL, Penton Building, Cleveland.

YOUNG METALLURGICAL OR MECHANical engineering graduate qualified for general and research machinability work on stainless steels. Some experience in operation of machine tools desired. Must be willing to go through extensive training period. Give training and experience. Address Box 337, STEEL, Penton Bldg., Cleveland.

SALESMAN FOR NEW ENGLAND TERRItory; experienced in mill supply or steel warehouse business, or closely allied line. Must have a following; irreproachable background; first class experience and references; a desire to work hard for a mutually profitable permanent connection. Preferably between 30 and 40 years of age. Write full details. All communications strictly confidential. Address General Sales Manager, Tubular Service Corp., 120-44th St., Brooklyn, N. Y.

EXCEPTIONAL OPPORTUNITY FOR EXperienced man with some technical training and successful sales record, for executive sales position with seamless steel tube mill. Exclusive territory, office, personnel. State salary and full details of training and experience. Address Box 338, STEEL, Penton Bldg., Cleveland.

YOUNG GRADUATE METALLURGIST with practical knowledge of the processing of stainless steels. Should be competent in metallography and experienced in the investigation of metallurgical problems of stainless steels in production and in the field. Give training and experience. Address Box 336, STEEL, Penton Bldg., Cleveland.

Castings

OHIO

THE WEST STEEL CASTING CO., Cleveland. Fully equipped for any production problem. Two 1½ ton Elec. Furnaces. Makers of high grade light steel castings, also alloy castings subject to wear or high heat.

PENNSYLVANIA

NORTH WALES MACHINE CO., INC., North Wales. Grey Iron, Nickel, Chrome, Molybdenum Alloys, Semi-steel. Superior quality machine and hand molded sand blast and tumbled.

Bids Wanted

Federal Works Agency, Public Buildings Administration, Washington, D. C., Oct. 10, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Standard Time, Nov. 12, 1940, for construction of the U. S. P. O. at Burgettstown, Pa. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

Distributors Wanted

CHICAGO MANUFACTURER OF RUST preventives desires representation in Detroit, Cleveland, and Pittsburgh districts for marketing an excellent line of rust preventives. Have wide acceptance by the largest industrial concerns. Reply full details, experience, age, territory desired. Address Box 326, STEEL, Penton Bldg., Cleveland.

WHEN THERE IS SOMETHING

you want to buy or sell, use the classified pages to tell other readers. Rates are moderate. Write STEEL, Penton Bldg., Cleveland.

ADVERTISING INDEX

This month Where-to-Buy Products Index carried in October 14 issue

◆ ◆ ADVERTISING INDEX ◆ ◆

This month Where-to-Buy Products Index carried in October 14 issue

It had to be Ductile and Still Machine Fast—

SPEED CASE STEEL

Solved the Problem!

SPEED CASE PERFORMANCE RECORD

NAME OF PART COMMUTATOR SHELL

	PREVIOUS PERFORMANCE	SPEED CASE PERFORMANCE
MATERIAL	2-5/16 Rd. 1112	2-5/16 Rd. SPEED CASE
MATERIAL COST	$4.05 cwt.	$4.40 cwt.
MACHINE COST	$103.00 - 1120 pcs.	$81.00 - 1120 pcs.
HEAT TREAT COST	None	None
STRAIGHTENING COST	None	None
GRINDING COST	None	None
MISCELLANEOUS COST	$5.00 - 1120 pcs.	$.1508
NET COST PER PART	$.1687	1120
PARTS PER TON STEEL	1120	

NET SAVINGS PER TON OF STEEL USED $20.04

SUMMARY MACHINING DATA

S.A.E. 1112 - 2 min. 9 sec. - 28 per hour - 1 Tool Grind 10 hrs.

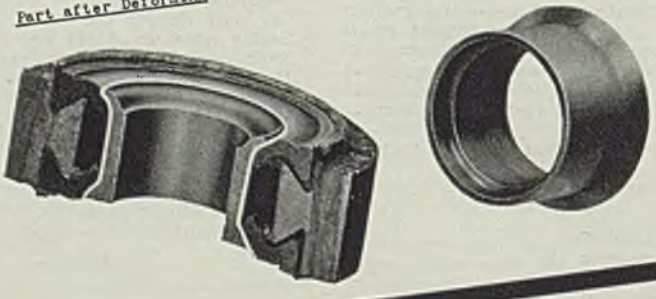
SPEED CASE - 1 min. 49 sec. - 35 per hour - 1 Tool Grind 20 hrs.

SKETCH OF PART

Customer changed from S.A.E. 1112 to SPEED CASE to obtain necessary ductility for deforming. SPEED CASE deformed without cracking. See actual photographs below.

Part after Deforming

Part before Deforming



Machines FAST...

SPEED CASE STEEL machines as fast as High Sulphur Bessemer Steel X1112.

● *and DUCTILE, TOO!*

SPEED CASE STEEL is as ductile as any of the Low Carbon Open Hearth Steels — X1314, 1020, etc.

"SPEED CASE Did the Job 100%!"

● SPEED CASE STEEL has solved many manufacturing problems involving a combination of *Machinability* and *Ductility*. The above part required great ductility and still had to *Machine FAST*. *SPEED CASE STEEL* results were 100% satisfactory. "Speed Case" can increase *YOUR* production also.

Sole Licensee for Eastern States

THE FITZSIMONS COMPANY

YOUNGSTOWN, OHIO

Licensor

MONARCH STEEL COMPANY

HAMMOND CHICAGO INDIANAPOLIS

MANUFACTURERS OF COLD FINISHED CARBON AND ALLOY STEEL BARS!