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Penton Building, Cleveland

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Cincinnati..... 1734 Carew Tower

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Oakland, Calif., Tel. Glencourt 7559

London..... Caxton House
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Published by THE PENTON PUBLISHING Co.,
Penton Building, Cleveland, Ohio. E. L. SHANER,
President and Treasurer; G. O. HAYS, Vice
President; F. G. STEINEBACH, Secretary.
Member, Audit Bureau of Circulations; Asso-
ciated Business Papers Inc., and National Pub-
lishers' Association.

Published every Monday. Subscription in the
United States, Cuba, Mexico and Canada, one
year \$4, two years \$6; European and foreign
countries, one year \$10. Single copies (current
issues) 25c.

Entered as second class matter at the postoffice
at Cleveland, under the Act of March 3, 1879.
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STEEL

ESTABLISHED 1882

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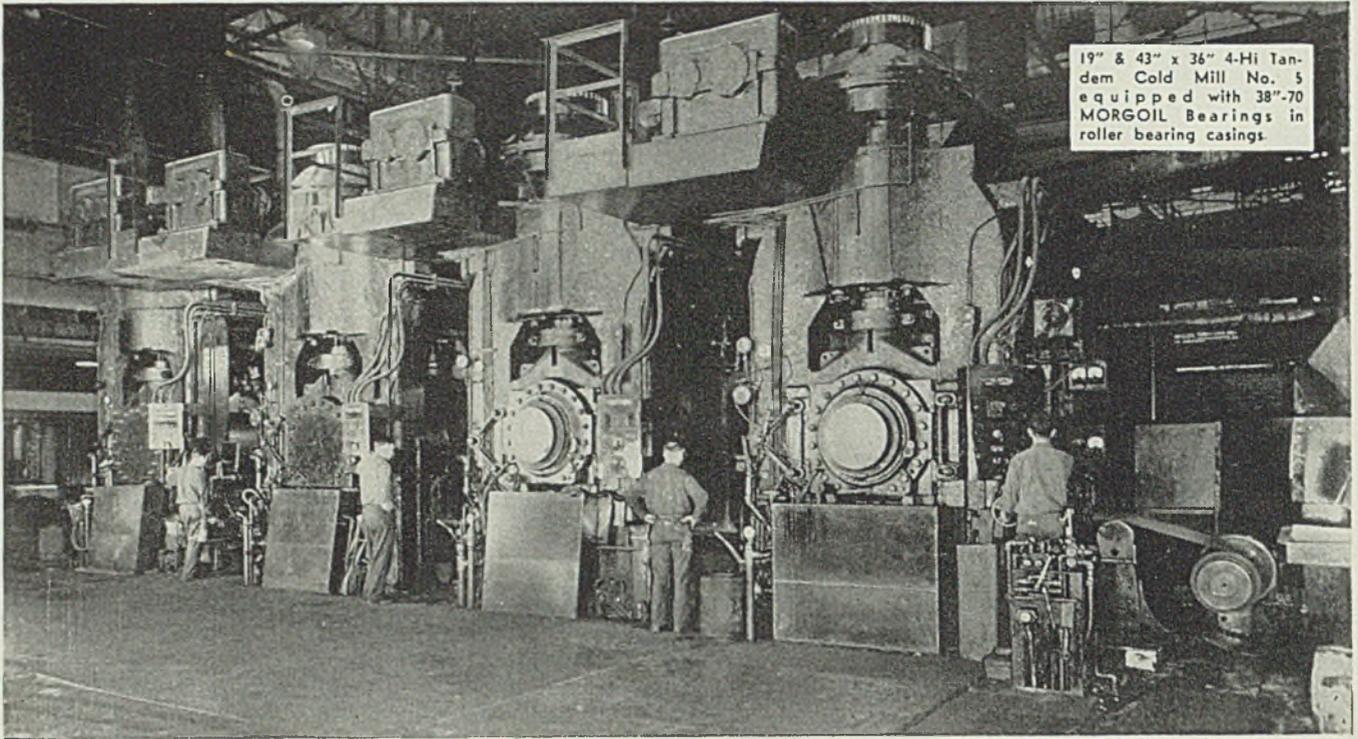


Volume 107—No. 13

September 23, 1940

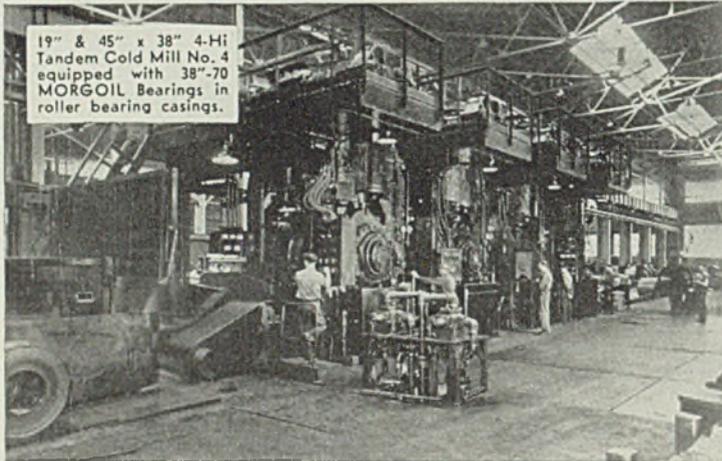
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PRODUCTION • PROCESSING • DISTRIBUTION • USE



19" & 43" x 36" 4-Hi Tandem Cold Mill No. 5 equipped with 38"-70 MORGOL Bearings in roller bearing casings.

MORGOLLS .. got the Job at Weirton



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MORGOL BEARINGS are becoming standard equipment for modern rolling mills and can be installed in many existing bearing cases. Write for the Morgoil book.

R-76



MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

MORGOL ROLL NECK **BEARINGS**

HIGHLIGHTING THIS ISSUE

■ STEEL production last week (p. 27) again stood at 93 per cent of ingot capacity, peak level so far this year. Demand continues to swell for all products but tin plate. Fearing scarcity, many consumers (p. 87) show anxiety over future requirements and are pressing for deliveries. Some steel, particularly grades requiring special heat treating and annealing, has been placed for next year at prices ruling at time of shipment. Producers talk reassuringly. Present steelmaking capacity, they believe (p. 21), should prove ample to take care of all requirements and they see no need for enlargement in capacity in the immediate future. A priorities system is seen as a possibility when armament requirements approach a peak.

. . .

Only a small percentage of present steel production (p. 21) is being sold to the government or to contractors with national defense orders. Such requirements, however, are expanding rapidly. Last week's awards (p. 24) were impressive for size and diversity. A large section of the metalworking industry has been mobilized or is in process of being mobilized. For one item alone, army spoons, 180 tons of stainless steel is needed. Construction work, largely linked with the defense program, is mounting rapidly. More than a score of cantonments are up for bids. . . The "draft industry" provision of the compulsory military training act reads reassuringly but (p. 23) much depends on its administration.

180 Tons For Spoons

Production of 1941 model automobiles (p. 36) is starting at a higher rate than a year ago. . . The farmer's income in 1940 (p. 39) is above the 1939 level. . . Politics must be removed from industrial mobilization or else its successful consummation will be dangerously delayed and perhaps fail, says Raoul E. Desvernine (p. 29). . . Federal housing projects are increasing

Farm Income Higher

in number and (p. 87) require a large amount of steel. . . Under a recommended federal training plan (p. 40) 1,259,200 additional skilled workers would be available by July 1, 1941. . . Bethlehem petitions Supreme Court (p. 32) not to transfer the determination of prices in government contracts from the executive to the judicial department.

. . .

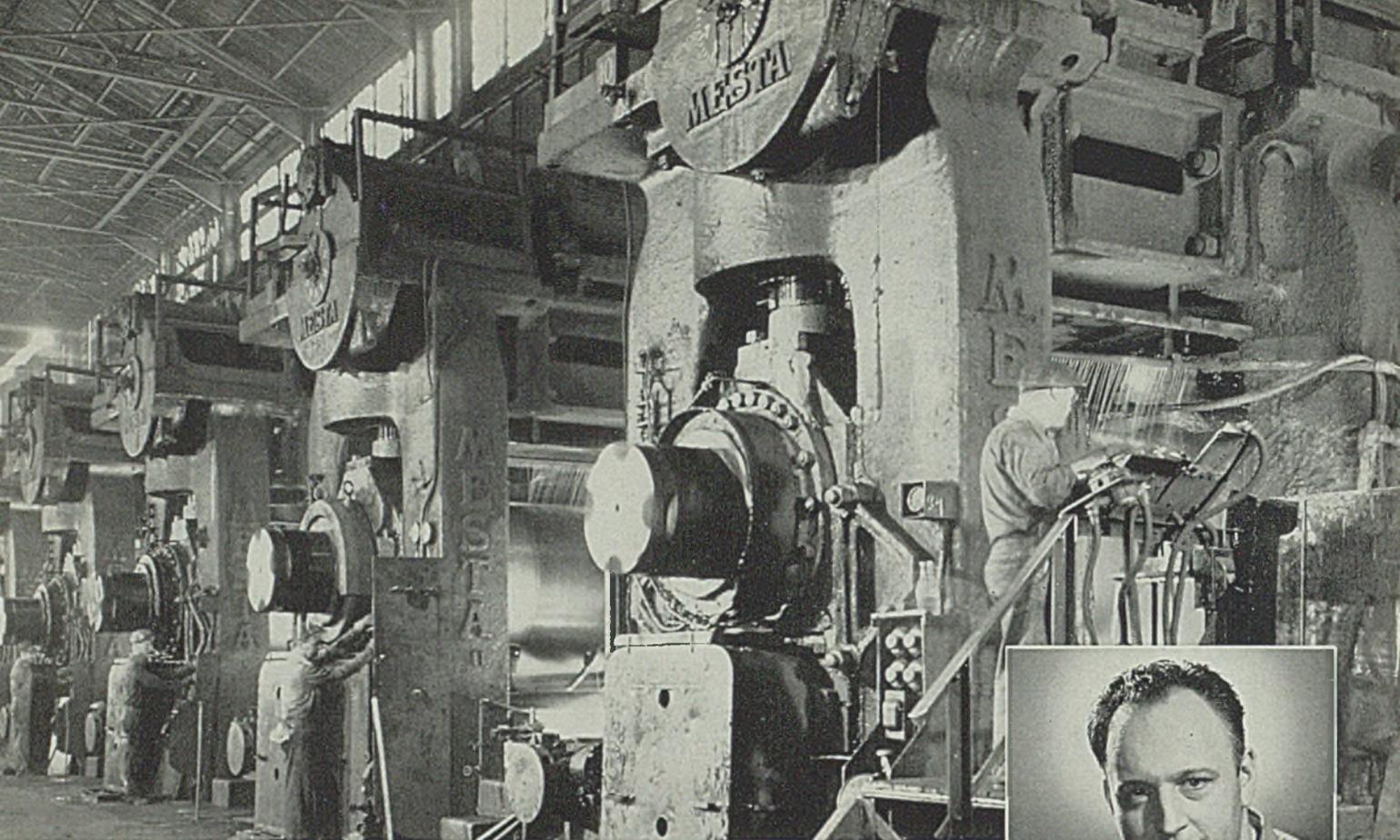
Visual spectra comparison methods, says an English metallurgist (p. 46), offer an extremely fast means of analyzing steel qualitatively. With accuracy within 20 per cent, these methods also are suitable for quantitative work. . . A novel hook-up (p. 58) removes the need for skill in duplicating dies. . . With all other factors standardized, says Wallace G. Imhoff (p. 54), any increase in the temperature of the galvanizing bath results in heavier zinc coatings. He stresses the importance of submersion time. . . A new graphitizing alloy used as a ladle addition (p. 57) transforms white cast iron into strong gray iron. . . A new booklet (p. 58) describes copper alloys used in the aircraft production industry.

. . .

James R. Longwell tells how to test and condition older machines (p. 49) so as to enable them to handle cemented carbide tools. . .

Welding Water Tanks

Flash welding is being employed successfully (p. 64) in fabricating hot water tanks that subsequently are porcelain enameled; an exacting procedure must be followed. . . Complete standardization, plus a good materials handling system, resulted in a big increase in production (p. 74) at a Pennsylvania aircraft plant. . . Making up banks of open hearth furnaces (p. 48) is facilitated by an improved dolomite throwing machine. . . A new processing line cleans, pickles and deposits zinc coating (p. 50) on 4002 pounds of small parts hourly. . . A new V-belt (p. 72) does not accumulate static charges.



Modern Mills and Skilled Men

CARRY ON THE

INLAND TRADITION FOR QUALITY

FROM the day Inland made its first steel, emphasis has always been placed on use of the most modern equipment available, the most advanced processes, and men of special training and great skill—the combination which assures highest uniform quality of steel mill products.

Because of this tradition most of Inland's steel-making and finishing equipment has been replaced within the past few years. Typical of recent improvements are: modern blast furnaces; new open hearth furnaces; a blooming mill of exceptional speed and flexibility; new 44-in. and 76-in. continuous sheet and strip mills; latest types of cold reduction mills, a completely rebuilt galvanizing department; new tin mills for production of tin plate by the modern

cold reduction method; and, new furnace and mill control devices that automatically guard quality and uniformity. The Inland steel mill is as modern as any in the world.

Operating the Inland mills are steel makers and metallurgists who know and produce uniform, high quality steel. They are men who have added much to the science of steel processing, and they can be counted on for important advancements to meet the needs of the future.

Many users of steel profit by the Inland tradition for high uniform quality. It saves them time and money. Let Inland's modern mills and skilled men go to work for you.

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

Ingot Capacity Held Adequate For Defense Requirements

Little Open Hearth Expansion Expected in Next Two Years.

Many Companies to Reinstate, Protect Seniority of Draftees.

Fairness of "Industry Conscription" Depends Upon Administration.

Army, Navy Awards for Week Total \$472,059,604.

■ DOES the United States face a probable shortage in steelmaking capacity? Will it be necessary to build more open hearths to supply steel for the warships, tanks, airplanes, ordnance and munitions plants and other national defense needs?

These questions were raised last week by anonymous "government economists" who predicted ingot capacity would become one of the "bottlenecks" in our armament plan.

The answer, of course, depends on the as yet unknown steel requirements of the program, requirements which now are being compiled by defense commission experts.

However, the industry's statistics show a comfortable cushion between actual production capacity and the highest recorded consumption. Rated ingot capacity, according to American Iron and Steel institute figures, is 81,828,958 net tons. Highest actual production (which may be considered synonymous with domestic consumption plus exports) was 60,829,752 tons. Average for the past ten years was 36,906,682 net tons.

Many Furnaces Obsolete

Eighty per cent operations would produce slightly more than 65,000,000 net tons a year, 5,000,000 tons more than peacetime requirements in the industry's best year and nearly 30,000,000 tons above the ten-year average. Ninety per cent operations would produce 73,000,000 tons.

Experts on open-hearth practice doubt that the industry with pres-

ent equipment could average 90 per cent of capacity for a year and believe it would do well to average 80 per cent. This is despite a current operating rate of 93 per cent and record averages of 93.4 and 90.8 per cent in 1919 and 1920, respectively.

Many of the larger open-hearth plants are considered obsolete by engineers; some were laid down before the turn of the century. Only 27 furnaces were built in the past eight years. In contrast the early years of World war I ushered in large scale expansion in steelmaking capacity, 105 open hearths being completed in 1916 and 102 in 1917.

In addition to obsolescence, production may be limited by a shortage of the most efficient charging materials and by a lack of highly skilled personnel. A leading engineer says open-hearth steel production depends on four factors, rated as follows: Furnace, 30; plant, 10; raw materials, 20; and personnel 40. As operations approach capacity, a shortage in raw materials and skilled operators is likely to result.

Open-hearth designers, as well as steel company executives, do not anticipate any considerable expansion of open-hearth capacity, at least not in the next two years. They believe that an average operating rate of between 80 and 90 per cent will produce sufficient steel for both normal and armament needs. They also believe the shortage, if any, will be felt first in ironmaking capacity.

Irving S. Olds, chairman of the

United States Steel Corp., substantiated this view last week at Pittsburgh when he said: "I believe the elasticity within the steel industry will permit an ample supply of steel when needed, although some system of priorities may be necessary."

E. G. Grace, president of Bethlehem Steel Corp., recently stated his belief that steel capacity is "reasonably adequate." Officials of the national defense advisory commission have expressed similar views. All recognize, of course, expansion will be necessary in armor plate, forging, shipbuilding and other war material facilities.

The difference between the amount of steel we can produce and the amount required for normal purposes, it is believed, should be adequate for the projected armament program, spread over several years.

ARMAMENT PROGRAM TAKING SMALL PART OF STEEL OUTPUT

Only a small percentage of present steel production is being sold to the government or to contractors with national defense orders, Irving S. Olds, chairman, United States Steel Corp., said last week. Mr. Olds, with B. F. Fairless, president of the corporation, and a group of other officers and directors made a tour of the corporation's properties in Pittsburgh, Chicago and Birmingham, Ala.

Production and delivery of the desired defense materials will be made in a shorter time and at less

cost if the job is managed by private enterprise, Mr. Olds asserted. There is no basis for charges of a "sitdown strike of capital" or of industry's "refusal to co-operate" with the government.

U. S. Steel has met without delay every requirement of the government in the national defense program, he said, and insisted that industry must not be held responsible for delays in the program.

Greater development by the steel industry in the future was predicted by Mr. Olds.

"During the hearings before the temporary national economic committee less than a year ago the thesis was advanced that industrial progress in the United States has reached its zenith—that no frontiers are left for business to conquer—that as a consequence our earlier economic notions about business must be completely revamped.

"I am not a believer in any such defeatist arguments. Unless we are to have a complete departure from the system of private enter-

prise which developed this country and made it the envy of the industrial world, I am confident that American business, if given a fair chance, will continue to develop and to go forward; that American resource and ingenuity will produce new inventions and new processes, opening up new lines of industrial activity; that private capital will be required and will be available for the financing of these new enterprises, as well as for taking care of the normal growth and development of established industries.

"The steel industry has not stood still in the past. I do not anticipate it will do so in the future."

Other members of the party included: Enders M. Voorhees, chairman, finance committee; Sewell L. Avery; Philip R. Clarke; Leon Fraser; William A. Irvin, former president; Thomas W. Lamont; Nathan L. Miller, general counsel; Junius S. Morgan; George A. Sloan; Robert C. Stanley, president, International Nickel Co.; and G. Cook Kimball.

Many Companies Will Reinstate, Protect Seniority of Draftees

■ HOW employes plan to protect the jobs of employes drafted for military service, and how they plan to fill the gaps that the draft measure will create is revealed in a survey by the research bureau of the American Management association, New York.

Weeks before the Burke-Wadsworth bill reached the conference stage, many companies had begun surveys of their personnel to determine how many employes would be affected. Many then proceeded to formulate policies regarding the treatment of employes called into service.

(Under the selective service law, an employer is obliged to consider as on furlough or leave of absence all selectees taken from his employ and to grant to them such insurance or other benefits as he customarily grants to employes on such status. He is under obligation to restore them to their jobs when they have finished their service, or to a "position of like seniority, status, and pay unless the employer's circumstances have so changed as to make it impossible or unreasonable to do so." During selectees' absence, an employer may not fill their places with members of the communist party or the German-American Bund.)

Covering a large group of typical manufacturing and other companies, the report reflected policies

affecting more than 300,000 hourly-paid and salaried employes.

Conditions differing from one company to the other make impossible a uniform policy. However, judging by the returns, the average conscripted employe in the large and more progressive companies will be treated as follows:

He will be assured of reinstatement. This assurance may however carry the qualification that the employe must be honorably discharged from military service and that he is mentally and physically fit at the time he makes his claim for reinstatement. Some concerns plan to give this assurance but will add such qualifications as: "If no national or business catastrophe has occurred," "if the individual would still be employed under normal conditions," or "if the application is made within a certain period after discharge from the army."

He will probably be reinstated at the same rate of pay.

His seniority rights will be maintained.

If his company has a pension plan, he will be given credit during his absence for continuous service.

He will also be given group protection under his group-insurance plan. Some companies qualify this promise with such statements as, "unless the man goes into active combat," "unless the problem be-

comes too extensive," or "as long as there is no increase in the ratio."

He will not be paid the difference between his army pay and his regular pay. A number of companies still provide for the payment of men undergoing short periods of military training, and such payment will be made to men leaving for the longer periods.

The employe who is hired to fill the place of the conscripted employe will be informed that his job is temporary, as will employes who are promoted to fill such positions.

Most vexatious problems are those of reinstatement and the maintenance of seniority rights, according to report.

Careful plans are being made to protect the seniority rights of conscripted employes but the report takes note of the difficulty that may arise in connection with union jurisdiction.

INLAND TO SUPPLEMENT PAY OF EMPLOYES DRAFTED

Inland Steel Co., Chicago, announced last week its plan to supplement income of employes subject to the national guard's first call to service or to the draft by monthly payment of an amount equal to base service pay.

The company will also maintain whatever group life insurance such employes may have at time of enlistment or call to service. Employes in military training for the year will retain their seniority, according to the company.

CHARGES PUBLIC MISLED ON PREPAREDNESS PROGRESS

Name-calling in congress and unfair criticism of the national defense commission and the government have misled the American public on the status of our preparedness program, according to Frederick S. Blackall Jr., president and treasurer, Taft-Pierce Mfg. Co., Woonsocket, R. I.

"Today New England is a madhouse of activity, related directly or indirectly to defense. I am amazed when I read some of the statements attributed to congressmen airing their views on the alleged 'lack of co-operation' by manufacturers . . .

"Manufacturers in New England have been working with army and navy defense boards and ordnance departments for M-day. It has been ten or 15 years since we had our first unofficial talks about tooling and manufacturing programs. Five years ago we had a sketchy program, but definite surveys were made to determine what New England could produce in the defense scheme."

Mr. Blackall warned against expectation of complete defense in less than two or three years.

Fairness of "Draft Industry"

Law Depends on Administration

■ MANUFACTURERS must accept and execute, on "fair and just" terms, orders for materials or products needed in the national defense when called upon to do so by the President, under the terms of the selective service bill as finally enacted.

Refusal to accept and execute such orders is punishable by a fine of not more than \$50,000 and imprisonment of not more than three years.

Act also provides the President can take over and operate a manufacturer's plant, either directly or through a contractor, for refusing a defense order. The government is required to pay "fair and just" rental for plant and facilities.

The section as passed represents considerable modification of the senate's original proposal which provided for "seizure" and condemnation of plants, with the government retaining title after the emergency had passed.

Compliance Is Obligatory

Its fairness will depend to large extent upon its administration. The complete section of the selective service bill relating to industrial conscription follows:

"Sec. 9—The President is empowered, through the head of the war department or the navy department of the government, in addition to the present authorized methods of purchase or procurement, to place an order with any individual, firm, association, company, corporation, or organized manufacturing industry for such product or material as may be required, and which is of the nature and kind usually produced or capable of being produced by such individual, firm, company, association, corporation, or organized manufacturing industry.

"Compliance with all such orders for products or material shall be obligatory on any individual, firm, association, company, corporation, or organized manufacturing industry or the responsible head or heads thereof and shall take precedence over all other orders and contracts theretofore placed with such individual, firm, company, association, corporation, or organized manufacturing industry, and any individual, firm, association, company, corporation, or organized manufacturing industry or the responsible head or heads thereof owning or operating any plant equipped for the manufacture of arms or ammunition or parts of arms or ammunition, or any necessary supplies or equipment for the army or navy, and any individual, firm, association, company, corporation, or organized manufacturing industry or the responsible head or heads thereof owning or operating any manufacturing plant, which, in

the opinion of the secretary of war or the secretary of the navy shall be capable of being readily transformed into a plant for the manufacture of arms or ammunition, or parts thereof, or other necessary supplies or equipment, who shall refuse to give to the United States such preference in the matter of the execution of orders, or who shall refuse to manufacture the kind, quantity, or quality of arms or ammunition, or the parts thereof, or any necessary supplies or equipment, as ordered by the secretary of war or the secretary of the navy, or who shall refuse to furnish such arms, ammunition, or parts of ammunition, or other supplies or equipment, at a reasonable price as determined by the secretary of war or the secretary of the navy, as the case may be, then, and in either such case, the President, through the head of the war or navy departments of the government, in addition to the present authorized methods of purchase or procurement, is hereby authorized to take immediate possession of any such plant or plants, and through the appropriate branch, bureau, or department of the army or navy to manufacture therein such product or material as may be required, and any individual, firm, company, association, or corporation, or organized manufacturing industry, or the responsible head or heads thereof, failing to comply with the provisions of this section shall be deemed guilty of a felony, and upon conviction shall be punished by imprisonment for not more than three years and a fine not exceeding \$50,000.

"The compensation to be paid to any individual, firm, company, association, corporation, or organized manufacturing industry for its products or material, or as rental for use of any manufacturing plant while used by the United States, shall be fair and just; provided, that nothing herein shall be deemed to render inapplicable existing state or federal laws concerning the health, safety, security, and employment standards of the employes in such plant."

Manufacturers' Group Surveys Defense Plants

■ Declaring that manufacturers already have invested millions of dollars in plant and machinery, tools and other equipment for defense work without assurance of exactly how the work will be paid for or under just what conditions it will have to be done, H. W. Prentis Jr., president, National Association of Manufacturers, last week said management of industry does not need to be "conscripted."

"It already has volunteered," he

declared, "and the introduction of more business into government rather than more government into business is what is really pushing ahead our program of national defense."

Mr. Prentis spoke at a regional meeting of the association at the Hotel Astor, New York, Sept. 18.

The association president announced that the organization, its industrial council and 243 affiliated organizations are conducting a nationwide survey to reveal all unknown defense potentialities of small and large plants. Another phase of present research is an economic study of war financing, price and labor controls, Mr. Prentis said. This has been instituted by Dr. Karl T. Compton, president, Massachusetts Institute of Technology, Cambridge, Mass., and chairman of the association's advisory committee on scientific research, and should be completed this month.

In addition to Mr. Prentis other speakers at the dinner session included Walter B. Welsenburger, executive vice president, National Association of Manufacturers, and Dr. Joseph R. Sizoo, Collegiate Church of St. Nicholas, New York.

Uncertainty Cited as Cause of Defense Lag

■ "To meet the emergency which began with the outbreak of the war last September, Revere has appropriated in the last year over \$1,500,000 for rounding out of plants and equipment," said C. Donald Dallas, president, Revere Copper & Brass Inc., New York, last week.

"We cannot take the risk of going further than this because first, if we built a new plant it would not be in production for over a year, and we do not know whether at the end of that time we would have any orders for it or not; second, if we did have orders, we know in advance that profits made would be largely taken by taxes, and at the end of the emergency we might have to borrow money at the banks to pay for taxes, besides having a white elephant on our hands.

"It is this sort of uncertainty that is slowing up the defense program against the wishes of manufacturers who are anxious to cooperate. It appears altogether illogical on the face of things to risk delaying preparedness because of our eagerness to tax profits on armament and essential fabricated and semifabricated manufacturers when other manufacturers of non-essential products and luxuries report individual net earnings far larger than all the earnings of the entire brass and copper fabricating industry or airplane industry."

Army, Navy Awards \$472,059,604:

73.4 Per Cent Is for Aircraft

■ UNITED STATES war department last week announced awards made under 1941 appropriations up to and including Sept. 7, totaled \$804,041,212.54. Listing of money spent, by department:

Ordnance department	.....\$397,308,214.36
Air corps	.....179,502,069.66
Quartermaster corps	.....167,196,676.00
Signal corps	.....22,446,366.73
Corps of engineers	.....19,190,227.49
Chemical warfare service	.....16,948,108.40
Medical corps	.....1,390,623.19
Coast artillery corps	.....58,926.71
Total	.....\$804,041,212.54

With \$40,062,294 announced previous week and this week's awards, total to date under 1941 appropriations is \$1,316,163,110.

War department last week announced following contract awards:

Aviation Mfg. Corp., Lycoming division, Williamsport, Pa., airplane engines, \$5,120,997.50.

Beech Aircraft Corp., Wichita, Kans., training planes, spare parts, \$13,115,138.13.

Bell Aircraft Corp., Buffalo, pursuit airplanes and spare parts, \$19,896,668.

Boeing Aircraft Co., Seattle, bombers and spare parts, \$59,762,850.

Boeing Airplane Co., Stearman Aircraft division, Wichita, Kans., training planes and spare parts, \$6,934,096.

Curtiss-Wright Corp., Curtiss Aeroplane division, Buffalo, 540 pursuit planes and parts, \$19,688,287.14; St. Louis Airplane division, Robertson, Mo., 150 planes and parts, \$16,631,185.88.

Douglas Airplane Co., Santa Monica, Calif., transport airplanes and spare parts, \$20,229,184.16.

Flour City Ornamental Iron Co., Minneapolis, ponton equipment, \$1,169,610.

General Electric Co., Schenectady, N. Y., searchlights, \$7,777,500.

Leach Bros., Oshkosh, Wis., ponton equipment, \$681,500.

Lockheed Aircraft Corp., Burbank, Calif., pursuit planes and spare parts, \$15,646,450.81.

Martin, Glenn L., Co., Baltimore, bombers and spare parts, \$14,269,646.31.

Packard Motor Car Co., Detroit, Rolls-Royce aeronautical engines, \$62,448,000.

Republic Aviation Corp., Farmingdale, Long Island, N. Y., pursuit airplanes and spare parts, \$56,499,924.36.

Sperry Gyroscope Co., Brooklyn, N. Y., searchlights, \$9,075,150.

Vultee Aircraft Inc., Downey, Calif., airplanes and parts, \$29,494,633.44.

Wright Aeronautical Corp., Paterson, N. J., airplane engines, \$8,829,144.35.

Ordnance Department Awards

Acme Machinery Co., Cleveland, forging machines, \$27,384.

Allegheny Ludlum Steel Corp., Water-villet, N. Y., annealed steel rod, \$42,777.21.

American Hollow Boring Co., Erie, Pa., copper nickel alloy cylinders, \$133,311.36.

American Saw Mill Machinery Co., Hackettstown, N. J., machines, \$1955.

Autocar Co., Ardmore, Pa., half track vehicles, \$7,271,103.

Bethlehem Steel Co., Bethlehem, Pa., annealed steel rod, \$42,982.80.

B. G. Corp., New York, spark plugs, \$6300.

Blakelee, G. S., & Co., Cicero, Ill., machines, \$19,026.

Carpenter Steel Co., Reading, Pa., annealed steel rod, \$42,845.73.

Chase Brass & Copper Co. Inc., Waterbury, Conn., ammunition components, \$10,283.20.

Cincinnati Milling Machine & Grinders Inc., Cincinnati, grinding machines, \$16,157.94.

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., infantry weapons, \$2,796,056.

Continental Motors Corp., Muskegon, Mich., automotive engines, \$11,412,000.

Crucible Steel Co. of America, New York, annealed steel rod, artillery materiel, \$145,730.73.

Essley, E. L., Machinery Co., Chicago, machines, \$30,348.

Federal Screw Works, Chelsea, Mich., ammunition components, \$22,575.

Guberson Diesel Engine Co., Chicago, automotive engines, \$2,915,095.86.

General Electric Co., Erie, Pa., artillery materiel, \$1,759,826.

General Motors Corp., Delco Products division, Dayton, O., ammunition components, \$110,114.79.

Goodrich, B. F., Co., Akron, O., track for half track vehicles, \$1,409,439.

Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$3774.20.

Harvey Metal Products Corp., Chicago, ammunition components, \$145,800.

Hendey Machine Co., Torrington, Conn., shapers, \$5028.

International Nickel Co. Inc., Huntington, W. Va., copper nickel alloy rods and cylinders, \$184,030.10.

Karp Metal Products Co. Inc., Brooklyn, N. Y., battery containers, \$1328.64.

Kelly, John P., Philadelphia, castings, patterns, \$1354.98.

Keuffel & Esser Co., Hoboken, N. J., fire control equipment, \$1440.

Lapointe Machine Tool Co., Hudson, Mass., broaching equipment, \$38,741.60.

Lindberg Engineering Co., Chicago, furnaces, \$4,373.30.

Mack Molding Co. Inc., Wayne, N. J., ammunition components, \$121,371.50.

Mattison Machine Works, Rockford, Ill., rip saws, \$2268.

Mesta Machine Co., Pittsburgh, artillery materiel, \$8,390,000.

Midvale Co., Nicetown, Pa., artillery materiel, \$1,260,308.

Miller Printing Machine Co., Pittsburgh, infantry weapons, \$503,727.

Modern Tool & Die Co., Philadelphia, gages, \$32,220.

Moore, George W., Boston, ammunition components, \$1760.

National Pneumatic Co., Rahway, N. J., artillery materiel, \$5,763,753.93.

New England Auto Products Corp., Pottstown, Pa., ammunition components, \$3470.

Niles-Bement-Pond Co., Pratt & Whitney division, chambering, rifling machines, \$156,780.

Oil Well Supply Co., Oil City, Pa., ammunition components, \$246,262.50.

Onsrud Machine Works Inc., Chicago, special machinery \$12,142.

Otis Elevator Co., Buffalo, parts for artillery carriages, \$3480.44.

Pennsylvania Forge Corp., Philadelphia, artillery materiel, \$109,025.

Peters Engineering Co., Philadelphia, gages, \$2650.

Precise Tool & Mfg. Co., Farmington, Mich., gages, \$5940.

Pullman-Standard Car Mfg. Co., Hammond, Ind., infantry weapons, \$838,150.

Revere Copper & Brass Inc., Baltimore, ammunition components, \$4391.40.

Rheem Mfg. Co., Chicago, ammunition components, \$326,541.

Scovill Mfg. Co., Waterbury, Conn., ammunition components, \$2364.60.

Standard Machinery Co., Providence, R. I., presses, \$6809.

Standard Pressed Steel Co., Jenkintown, Pa., ammunition components, \$290,190.

Stacey-Schmidt Mfg. Co., York, Pa., assembling, crimping machines, \$2400.

Transue & Williams Steel Forging Corp., Alliance, O., end connections, \$5673.

Troy Tool & Gage Co., Detroit, gages, \$2564.

Ulmer, J. C., Co., Cleveland, gages, \$15,537.

Underwood Machinery Co., South Boston, Mass., power rammers, \$11,255.

U. S. Tool Co. Inc., Ampere, N. J., milling machines, \$7377.50.

United States Gauge Co., New York, gages, \$3606.

Vinco Corp., Detroit, gages, \$75,096.97.

Wang Textile Co., New York, ammunition components, \$9081.45.

Wheland Co., Chattanooga, Tenn., artillery materiel, \$1,500,000.

York Safe & Lock Co., York, Pa., artillery materiel, \$3,633,918.97.

Quartermaster Corps Awards

Aldrich, W. J., San Antonio, Tex., construction at Normoyle QM Depot, Tex., \$62,842.

Central California Construction Co., San Francisco, gas distribution system at Stockton Airport, Calif., \$5983.

Chamberlain & Strain, San Antonio, Tex., construction of warehouses at Ft. Sam Houston, Tex., \$157,130.

Dunn Construction Co. Inc., & John S. Hodgson Co., Birmingham, Ala., construction at Fort McClellan, Anniston, Ala., \$3,335,977.

Detroit Incinerator Co., Detroit, incinerator at Ft. Knox, Ky., \$15,015.

Eureka Electric Co., San Francisco, lighting system at McClellan Field, Sacramento, Calif., \$2040.

Goyke H. R., & Co., Jacksonville, Fla., housing at Story, Va., \$289,880.

Harley-Davidson Motor Co., Milwaukee, motorcycles, \$242,515.35.

Indian Motorcycle Co., Springfield, Mass., motorcycles, \$182,540.

Jones, J. A., Construction Co., Charlotte, N. C., construction at Camp Shelby, Hattiesburg, Miss., \$9,760,800.

LaFountain, A. A., Inc., Hackensack, N. J., hospital group, buildings, Ft. Dix, N. J., \$1,713,100.

Light, Joseph E., Construction Co., Washington, recruit reception center, Ft. Geo. G. Meade, Md., \$111,000.

Lowry, John, Inc., New York, ordnance buildings and utilities at Picatinny arsenal, N. J., \$910,454.

Macnsons, San Francisco, water distribution system at Stockton Airport, Calif., \$17,487.

Miller, A. J., Auto Cruiser Co., Bradenton, Fla., trailers, \$20,196.82.

Shoemaker, S. A., & Son, Harrisburg, Pa., temporary housing at Middletown air depot, Pa., \$8899.

Starrett Bros. & Eakin Inc., New York, construction at Camp Blanding, Stark, Fla., \$9,064,470.

Taylor Iron Works & Supply Co., Macon, Ga., elevated steel tank, Southeast air depot Mobile, Ala., \$29,444.

Tellepson Construction Co., Houston, Tex., construction Ellington Field, Tex., \$952,950.

Walsh Construction Co., Long Island City, N. Y., temporary buildings, Camp Edwards, Falmouth, Mass., \$7,240,462.

Watt & Sinclair, Palm Beach, Fla., shop building, Municipal Airport, Orlando, Fla., \$107,190.

Wiggin, S. B., Detroit, recreation buildings at Ft. Knox, Ky., \$35,973.

Chemical Warfare Service Awards

American Type Founders Sales, Corp., Baltimore, power paper cutters, \$1169,30.

Baltimore Machinery Works, Baltimore, water pumps, \$5795.

Blaw-Knox Co., Pittsburgh, disposal reactor, \$4416.

Connery Construction Co., Philadelphia, tanks, hoppers, \$1575.

Crown Can Co., Philadelphia, chemical containers, \$71,354.60.

(Please turn to Page 25)

Purchases Under Walsh-Healey Act

(In week ended Sept. 7)

Iron and Steel Products

	Commodity	Amount
American Locomotive Co., New York	Springs	\$10,680.18
Beatrice Steel Tank Mfg. Co. Inc., Beatrice, Neb.	Grain bins	*110,929.00
Braeburn Alloy Steel Corp., Braeburn, Pa.	Steel	11,631.98
Bridgeport Thermostat Co. Inc., Bridgeport, Conn.	Practice bombs	188,167.50
Butler Mfg. Co., Kansas City, Mo.	Grain bins	*1,572,670.00
Carnegie-Illinois Steel Corp., Washington	Steel	22,933.57
Carpenter Steel Co., Reading, Pa.	Bar steel	12,306.87
Columbian Steel Tank Co., Kansas City, Mo.	Grain bins	*237,793.75
Corbin Cabinet Lock Co., New Britain, Conn.	Locks	38,578.31
Crane Co., Washington	Gate valves	32,768.00
Crown Can Co., Philadelphia	Tin cans	20,628.35
Crucible Steel Co. of America, Seattle	Steel	59,736.00
Cyclone Fence Co., Waukegan, Ill.	Fencing	14,346.13
Eaton, A. N., Omaha, Neb.	Metal products	*264,750.00
Hager, C., & Sons Hinge Mfg. Co., St. Louis	Hinges	36,137.60
Jones & Laughlin Steel Corp., Pittsburgh	Steel	21,834.16
Mount Vernon Bridge Co., Mount Vernon, O.	Steel bridge	*240,630.00
Pennsylvania Forge Corp., Philadelphia	Steel forging	88,730.00
Reeves Steel & Mfg. Co., Dover, O.	Cans, buckets	35,569.48
Republic Steel Corp., Massillon, O.	Bar steel	10,004.14
Rhodes, James H., & Co., Long Island City, N. Y.	Steel wool	10,015.20
Russakov Can Co., Chicago	Practice bombs	117,300.00
Ryerson, Joseph T., & Son Inc., Chicago	Steel angles	15,103.15
Sharon Steel Corp., Sharon, Pa.	Steel	13,816.19
Struthers-Wells-Titusville Corp., Titusville, Pa.	Steel forgings	*87,520.00
Tennessee Metal Culvert Co., Knoxville, Tenn.	Welded pipe	13,590.84
Timken Roller Bearing Co., Canton, O.	Bar steel	37,010.60
Tredegar Co., Richmond, Va.	Projectiles	119,083.50
United States Gauge Co., New York	Check valves	15,300.00
United States Pipe & Foundry Co., San Francisco	Cast iron pipe	12,813.40
United States Steel Export Co., Washington	Fencing material	23,677.21
Utica Cutlery Co., Utica, N. Y.	Jack-knives	12,131.70
Wackman Welded Ware Co., St. Louis	Liquid drums	55,004.00
Walworth Co., New York	Valves, cocks	21,116.50
Wheeling Corrugating Co., Wheeling, W. Va.	Hoods, buckets	52,774.21
Yale & Towne Mfg. Co., Stamford, Conn.	Locks	24,901.39

Nonferrous Metals and Alloys

American Brass Co., Waterbury, Conn.	Cartridge disks	*\$80,190.00
American Smelting & Refining Co., San Francisco	Pig lead	70,800.00
Bohn Aluminum & Brass Corp., Detroit	Booster units	123,625.80
Bridgeport Brass Co., Bridgeport, Conn.	Cartridge cases	1,187,800.00
Chase Brass & Copper Co. Inc., Waterbury, Conn.	Cartridge cases	2,766,813.00
Columbian Bronze Corp., Freeport, L. I., N. Y.	Bronze castings	14,337.50
Federal Screw Works, Detroit	Units, fuzes	32,622.50
General Time Instruments Corp., LaSalle, Ill.	Fuze parts	185,299.70
International Nickel Co. Inc., New York	Alloy	11,039.98
Norris Stamping & Mfg. Co., Los Angeles	Cartridge cases	356,160.00
Northwest Lead Co., San Francisco	Pig lead	43,520.00
Revere Brass & Copper Co., New Bedford, Mass.	Copper tubing	12,000.00
Seovill Mfg. Co., Waterbury, Conn.	Tubes	50,919.07
Stewart-Warner Corp., Chicago	Time units	222,625.20
Velt & Young, Philadelphia	Ejecting stems	15,845.00
Waltham Watch Co., Waltham, Mass.	Fuze parts	16,619.30
York Safe & Lock Co., York, Pa.	Fuze setters	122,132.55

Machinery and Other Equipment

American Hoist & Derrick Co., St. Paul	Locomotive crane	\$21,000.00
Bliss, E. W., Co., Brooklyn, N. Y.	Punch presser	22,330.00
Brown & Sharpe Mfg. Co., Providence, R. I.	Milling machines	25,800.00
Bullard Co., Bridgeport, Conn.	Turret lathes	10,952.00
Carrier Corp., New York	Refr. units	31,277.74
Cincinnati Mill. Mach. & Cinc. Grinders Inc., Cincinnati	Milling machines	23,024.00
Dravo Corp., Pittsburgh	Concrete buckets	10,200.00
Essley, E. L., Machinery Co., Chicago	Lapping machines	88,714.00
Eucell Crane & Hoist Co., Euclid, O.	Traveling crane	10,025.00
Ex-Cell-O Corp., Detroit	Diesel engines	15,449.80
Gleason Works, Rochester, N. Y.	Cutting machine	20,532.00
Henriol Laundry Machinery Co., Boston	Washing machines	17,675.00
Illinois Tool Works, Chicago	Checking machine	10,409.50
Industrial Brownhoist Corp., Birmingham, Ala.	Locomotive crane	24,700.00
Johnson, C. S., Co., Champaign, Ill.	Mixer plant	90,920.00
Kearney & Trecker Corp., Milwaukee	Milling machine	75,854.00
Landers, Frary & Clark, New Britain, Conn.	Liquid container	Indefinite
Landis Tool Co., Waynesboro, Pa.	Grinder	18,500.00
Lapointe Machine Tool Co., Hudson, Mass.	Broaching equip.	66,493.85
Lloyd & Arms Inc., Philadelphia	Honing mach., press	31,403.00
Lodge & Shipley Machine Tool Co., Cincinnati	Lathes	13,741.00
Mesta Machine Co., Pittsburgh	Planer	135,000.00
Niles-Bement-Pond Co., Hartford, Conn.	Lathes	19,710.00
Phillips Pump & Tank Co., Cincinnati	Pump tank	16,829.00
Prentiss, Henry, & Co. Inc., New York	Turret lathes	35,133.00
Ransome Concrete Machinery Co., Dunellen, N. J.	Weld. positioners	13,515.00
Reed-Prentice Corp., Worcester, Mass.	Lathes	15,229.00
Rockford Machine Tool Co., Rockford, Ill.	Shapers	10,031.00
Silent Hoist Winch & Crane Co., Brooklyn, N. Y.	Tractor cranes	16,710.00
Stokes, F. J., Machine Co., Philadelphia	Pelleting presser	47,760.00
Success Mfg. Co., Gloucester, Mass.	Refrigerators	11,532.20
Vickers Inc., Waterbury, Conn.	Hydraulic pumps	39,193.25
Warner & Swasey Co., Cleveland	Turret lathes	45,945.00
Wilson-Weesner-Wilkinson Co., Knoxville, Tenn.	Tractors	*2,452.00

GRAND TOTAL

\$10,117,247.37

*Estimated.

Army, Navy Awards

(Continued from Page 24)

Carey Machinery & Supply Co., Baltimore, parts for air compressor, \$1642.
Condenser Service & Eng. Co. Inc., Hoboken, N. J., condenser, \$1385.
Continental Can Co. Inc., New York, caustic parts, \$29,301.89.
Federal Tin Co., Baltimore, gas mask components, \$42,308.20.
Gries Reproducer Co., New York, testing gages, \$1722.25.
Hoke Inc., New York, charging apparatus, \$1444.14.
Laudis Machine Co., Waynesboro, Pa., shell tapper, \$16,837.40.
Lloyd & Arms Inc., Philadelphia, lathes, \$14,670.
Nash Engineering Co., South Norwalk, Conn., pump, \$1588.
Pittsburgh Electrodryer Corp., Pittsburgh, carbon monoxide dryer, \$3485.
Rau Fastener Co., Providence, R. I., riveting machine, \$1400.
Revere Copper & Brass Inc., Rome, N. Y., inertube nozzles, \$37,420.
Ryerson, Joseph T., & Son Inc., Philadelphia, steel, \$1126.78.
Struthers-Wells-Titusville Corp., Warren, Pa., condensers, coolers, \$2110.
Stevens Metal Products Co., Niles, O., drums, \$1450.
Swind Machinery Co., Philadelphia, turret lathes, \$9592.
Union Iron Works, Erie, Pa., boilers, \$78,331.
Virginia Rubatex, Bedford, Va., outlet valves, \$9900.

Signal Corps Awards

Federal Telegraph Co., Newark, N. J., radio transmitting equipment, \$543,753.50.
Rauland Corp., Chicago, radio transmitting equipment, \$45,415.

Navy department announced following contract awards last week:

Fairbanks Morse & Co., Atlanta, Ga., motor-generator sets, navy yard, Charleston, S. C., \$31,371.

Bureau of Supplies and Accounts Awards

All-Steel-Equipment Co. Inc., Aurora, Ill., metal lockers, \$91,467.50.
American Steel & Wire Co. of New Jersey, Worcester, Mass., electric cable \$105,809.97.
American Tool Works Co., Cincinnati, drilling machines, \$15,579.
Anacosta Wire & Cable Co., Hastings-on-Hudson, N. Y., electric cable, \$217,045.60.
Associated Shipbuilders, Seattle, covered lighters, \$42,300.
Autocar Sales & Service Co., Washington, motor trucks, \$6907.
Axelson Mfg. Co., Los Angeles, engine lathes, \$61,459.20.
Bell Aircraft Corp., Buffalo, adapters, \$19,750.
Bendix Aviation Corp., Pioneer Instrument Division, Bendix, M. J., gyro horizon indicators, altimeters, \$995,490.
Bridgeport Brass Co., Bridgeport, Conn., condenser tubes, \$158,331.41.
Buffalo Pumps Inc., North Tonawanda, N. Y., centrifugal pumps, \$36,540.
Bullard Co., Bridgeport, Conn., turret lathes, \$97,053.81.
Burke Electric Co., Erie, Pa., motor generators, \$14,007.50.
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling, grinding machines, \$131,222.23.
Collier Insulated Wire Co., Paizucker, R. I., electric cable, \$218,175.55.
Consolidated Machine Tool Corp., Rochester, N. Y., engine lathes, \$42,350.
Crane Co., Chicago, pipe flanges, \$5170.71.
Crescent Truck Co., Lebanon, Pa., sleepers, \$11,475.
Crosby Signal Stores Inc., Piquette, Miss., turpentine, \$13,826.
Daniel Woodhead Co., Chicago, meat-desecol jump sockets, \$1770.
Doehler Metal Furniture Co. Inc., Evans-

ville, Ind., steel bunks, cabinets, \$84,616.
 Douglas Aircraft Co. Inc., Santa Monica, Calif., airplanes, \$9,602,384.20.
 Eclipse Aviation division, Bendix Aviation Corp., Bendix, N. J., starters, \$201,762.
 Electric Products Co., Cleveland, welding outlet panels, \$68,000.
 Farrel-Birmingham Co. Inc., Buffalo, gear generator, \$34,633.25.
 Flagg, Stanley G. & Co. Inc., Stowe, Pa., pipe flanges, \$39,938.46.
 General Cable Corp., Bayonne, N. J., Perth Amboy, N. J., Rome, N. Y., electric cable, \$326,390.29.
 General Electric Co., Schenectady, N. Y., parts for turbines, electric cable, electronic tubes, \$209,988.58.
 General Electric X-Ray Corp., Chicago, X-ray outfit, \$8739.
 General Time Instruments Corp., Thomaston, Conn., mechanical clocks, \$24,345.
 International Harvester Co. Inc., Washington, motor trucks, \$130,144.70.
 J. K. Welding Co. Inc., Long Island City, N. Y., covered lighters, \$167,500.
 Kearney & Trecker Corp., Milwaukee, milling machines, \$59,763.85.
 Linde Air Products Co., New York, welding heads, rods, \$6053.
 Lockheed Aircraft Corp., Burbank, Calif., conversion of landing gear, \$8723.54.
 Lodge & Shipley Machine Tool Co., Cincinnati, engine lathes, \$119,756.
 Lloyd & Arms Inc., Philadelphia, lathes, \$10,509.
 Manning, Maxwell & Moore Inc., Boston, steel valves, \$9860.58.
 Miller-Dunn Co., Miami, Fla., diving apparatus, \$6600.
 National Electric Products Corp., Economy, Pa., electric cable, \$217,662.80.
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., jig borer machine, \$12,057.
 Okonite Co., Passaic, N. J., electric cable, \$155,344.40.
 Prentiss, Henry, & Co. Inc., New York, horizontal boring, milling and drilling machines, boring mill, \$96,594.
 Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire division, Yonkers, N. Y., electric cable, \$215,758.53.
 Picker X-Ray Corp., Cleveland, X-ray units, \$14,615.
 Rockbestos Products Corp., New Haven, Conn., electric cable, \$155,718.13.
 Sellers, Wm., & Co. Inc., Philadelphia, boring, drilling, milling machines, \$58,820.
 Simplex Wire & Cable Co., Cambridge, Mass., cable, \$18,666.50.
 Square D Co., Kollsman Instrument division, Elmhurst, L. I., N. Y., aircraft altimeters, \$401,900.
 Swind Machinery Co., Philadelphia, horizontal boring, milling and drilling machine, \$17,565.
 Timken Roller Bearing Co., Canton, O., roller paths and rollers, steel, \$24,554.98.
 Triumph Explosives Inc., Elkton, Md., aircraft engine starter cartridge, \$75,430.
 United Aircraft Corp. Hamilton Standard Propellers division, East Hartford, Conn., propellers servicing equipment, \$19,672.06.
 U. S. Axle Co. Inc., Pottstown, Pa., engine overhaul stands, \$8748.40.
 Van Norman Machine Tool Co., Springfield, Mass., milling machine, \$6604.
 Walworth Co., Boston, pipe flanges, \$19,433.25.
 Ward Leonard Electric Co., Mt. Vernon, N. Y., face plate type rheostats, \$5176.35.
 Western Pipe & Steel Co. of Calif., San Francisco, covered lighters, \$462,000.
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., arc welding sets, \$11,396.
 Wilson Inc., Thomas C., Long Island City, N. Y., brushes and brush sections, boiler tube, \$43,555.50.
 Yellow Truck & Coach Mfg. Co., General Motors Truck & Coach division, Pontiac, Mich., motor trucks, \$12,957.55.

Canadian Contracts for Week Total \$10,477,745

■ Department of munitions and supply, Ottawa, last week announced contracts totaling \$10,477,745, of which \$2,100,000 was for construction and \$243,882 went to United States companies. Awards include:

To United States companies:

Ordnance: Auto Ordnance Corp., New York, \$77,742; Smith & Wesson Firearms Co., Springfield, Mass., \$35,400.

Munitions: American Crucible Co., Shelton, Conn., \$12,446.

Aircraft Supplies: Lockheed Aircraft Corp., Burbank, Cal., \$15,056.

Naval Supplies: General Arc Lighting Co. Inc., Long Island City, N. Y., \$28,302; Woodhouse Chain Works, Trenton, N. J., \$43,598; Powell Anchor & Chain Co., \$12,678; National Malleable & Steel Castings Co., Cleveland, \$7793.

Machinery and Tools: Greenlee Tool Co., Rockford, Ill., \$10,864.

To Canadian companies:

Naval Supplies: Saint John Iron Works Ltd., Saint John, N. B., \$39,900; Anglo-Canadian Wire Rope Co. Ltd., Montreal, \$7874; Canada Wire & Cable Co. Ltd., Montreal, \$191,616; Renfrew Electric & Refrigerator Co. Ltd., Renfrew, Ont., \$18,660; Canadian John Wood Mfg. Co. Ltd., Toronto, \$16,440; Horton Steel Works Ltd., Toronto, \$33,500; Donald Rope & Wire Cloth Co. Ltd., Hamilton, Ont., \$18,300; British Ropes Ltd., Vancouver, B. C., \$119,581; Hamilton Bridge, Western Ltd., Vancouver, \$10,285; Ross & Howard Iron Works Co. Ltd., Vancouver, \$8565; Wrights' Canadian Ropes Ltd., Vancouver, \$113,355.

Mechanical Transport: Canadian Trade Corp. Ltd., Montreal, \$47,725; LaFrance Fire Engine & Foamite Ltd., Montreal, \$11,365; General Motors Products of Canada Ltd., Oshawa, Ont., \$524,082; Dunlop Tire & Rubber Goods Co. Ltd., Toronto, \$33,664; Goodyear Tire & Rubber Co. of Canada Ltd., New Toronto, Ont., \$71,093; Firestone Tire & Rubber Co. of Canada Ltd., Hamilton, \$71,093; Ford Motor Co. of Canada Ltd., Windsor, Ont., \$652,749.

Aircraft Supplies: Canadian Vickers Ltd., Montreal, \$5040; Noorduyn Aviation Ltd., Montreal, \$8535; Robert Mulhall, Ottawa, \$9570; Fleet Aircraft Ltd., Ft. Erie, Ont., \$5976.

Machinery and Tools: John Bertram & Sons Co. Ltd., Montreal, \$7543; Williams & Wilson Ltd., Montreal, \$16,650; Ontario Hughes-Owens Co. Ltd., Ottawa, \$9450.

Electrical Equipment: Canada Wire & Cable Co. Ltd., Montreal, \$15,945; Canadian General Electric Co. Ltd., Ottawa, \$14,094; Northern Electric Co. Ltd., \$20,025; Outboard Marine & Mfg. Co. of Canada Ltd., Peterborough, Ont., \$16,891; Canadian Telephone & Supplies Ltd., Toronto, \$18,346; English Electric Co. of Canada Ltd., St. Catharines, \$14,410.

Shipbuilding: Chantier Maritime de St. Laurent Ltd., St. Laurent, Que., \$28,500.

Munitions: British admiralty, England, \$444,000; General Steel Wares Ltd., Montreal, \$5680; Fros & Wood Co. Ltd., Smiths Falls, Ont., \$28,350; International Metal Industries Ltd., \$85,150.

Ordnance: War office, England, \$7500; Sunshine Waterloo Co. Ltd., Waterloo, Ont., \$5755.

Barrack Supplies:—Steel Furnishing Co. Ltd., New Glasgow, N. S., \$12,800; Thomas Boner & Co. Ltd., Montreal, \$63,665; Canadian Bag Co. Ltd., Montreal, \$53,650; Scythies & Co. Ltd., Montreal, \$52,480; Woods Mfg. Co. Ltd., Ottawa, \$9075; Roberts Simpson Co. Ltd., Toronto, \$26,175; John Taylor & Co. Ltd., Toronto, \$6970.

Miscellaneous: Air ministry, England, \$22,631; Cockfield, Brown & Co. Ltd., Montreal, \$16,550; Scarfe & Co. Ltd., Ottawa, \$6695.

Construction: M. F. Schurman Co. Ltd., Summerside, P.E.I., \$407,000; T. Pringle & Son Ltd., Montreal, \$140,000; Iron Fireman Mfg. Co. of Canada Ltd., \$20,982; W. C. Brennan Contracting Co., Hamilton, \$353,112; Johnson Bros. Co. Ltd., Brantford, Ont., \$272,387; Vulcan Iron Works, Winnipeg, Man., \$24,757; Shoquist Construction Ltd., Saskatoon, Sask., \$392,789; Smith Bros. & Wilson Ltd., Saskatoon, \$121,177; Buchan Construction Co., Calgary, Alta., \$319,715; Northern British Columbia Power Co. Ltd., Prince Rupert, B. C., \$23,400; Northern Boat Building Co. Ltd., Edmonton, Alta., \$101,500; National Contracting & Supply Co. Ltd., Prince Albert, Sask., \$205,500; Claydon Co. Ltd., Winnipeg, \$240,700; Bird Construction Co. Ltd., Saskatoon, \$415,500; A. W. Heise & Co. Ltd., Saskatoon, \$398,500; General Construction Co. Ltd., Vancouver, \$285,500.

SEVEN MONTHS' CANADIAN STEEL IMPORTS ARE \$153,903,000

Canadian imports of iron and steel products for first seven months ended July totaled \$153,903,000. United States contributed \$138,370,000, or 90 per cent. For full year 1939, imports were \$183,159,650, of which \$158,138,245 came from United States and \$19,253,070 from Great Britain. Principal imports now are rolling mill products, farm implements, tractors and automobiles.

Canada's exports of iron and steel products first seven months this year were \$63,102,432, of which \$15,976,901 went to Great Britain and \$4,954,239 to United States.

"Hitler Peace or British Victory—U. S. Will Lose"

■ American commerce and industry will suffer regardless of who wins the war, according to Dr. J. Anton de Haas, professor of international relationships, Harvard university, speaking before the Purchasing Agents Association of Pittsburgh, Sept. 17 in the William Penn hotel, Pittsburgh. Dr. De Haas outlined for several hundred present at the dinner his ideas of the direct effects of the war on American industry, effects of the national defense program on our economy, and what reconstruction work will be necessary after the war.

Guests were welcomed by Louis M. Potter, president, Purchasing Agents Association of Pittsburgh, and purchasing agent of Vanadium Alloys Steel Co. Chairman of the evening, Irvin E. Walton, purchasing agent, Heppenstall Co., introduced executives of the National Association of Purchasing Agents and past presidents of the local association.

Dr. De Haas pointed out effects of the war already felt here are loss of European trade, increase in industrial exports and a heavy loss in farm exports. Great Britain has

been offering greater export competition, which Dr. De Haas expects will increase after the war is over in case Britain wins.

While an early peace would create but few reconstruction problems here, a long war would make these serious. For a year or two our defense program would offset any decline due to end of war abroad. In case of a Hitler peace, however, a setback to United State's foreign trade would be certain. Imports would be only on Hitler's terms under the barter system. Our gold would be worthless abroad and payments would be in commodities.

Argentina Embargoes American Imports

■ Argentina's exchange control commission ordered an embargo, ostensibly to conserve dollar exchange, on imports from United States, Sept. 19. Reported to be informal and probably temporary, the embargo was applied the day before Warren Lee Pierson, president, Export-Import Bank of Washington, arrived at Rio de Janeiro. Mr. Pierson is to discuss with representatives of South American countries, measures to give them economic and financial assistance.

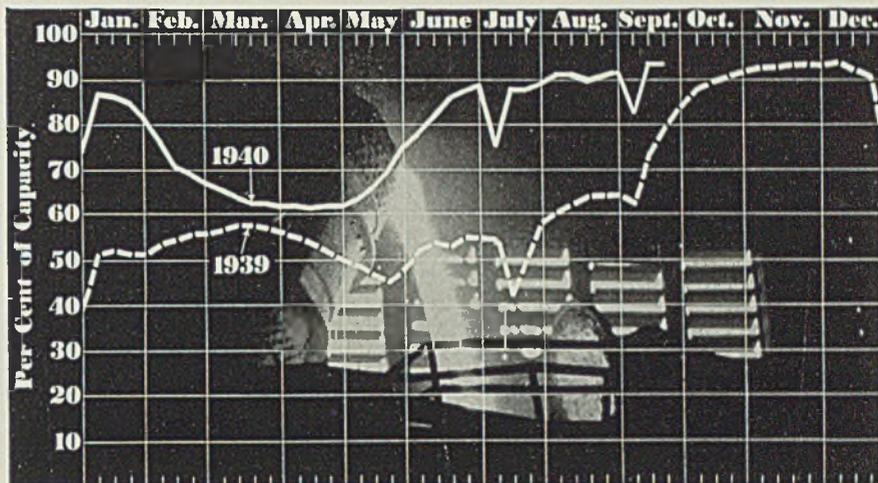
Unofficial circles at Buenos Aires were inclined to believe the move was made to place Argentina in a better bargaining position when Mr. Pierson arrives there for discussions. Trade statistics, however, indicate the country may have a definite dollar shortage, brought about by an adverse trade balance for 1939 and the first half of 1940 totaling more than \$18,000,000.

Mr. Pierson, at Rio, said plans to build a steel manufacturing plant in Brazil would be settled entirely in the United States negotiations. The Export-Import Bank credit will be guaranteed by the Bank of Brazil, and will be used exclusively in United States to purchase machinery and set up the plant.

Foundry Equipment Index Lower in August

■ Foundry Equipment Manufacturers association, Cleveland, reports the index for net orders closed for new equipment in August was 167.2, compared with 209.8 in July. The index for repairs was 160 in August and 147.8 in July. Index for total sales was 165.4, against 194.4 in July.

The index figures are per cent of the base, or monthly average of reported sales to metal working industries during 1937-38-39. A practical comparison of figures on the old base, 1922-23-24 figures, can be determined by multiplying new base figures by 1.328.



PRODUCTION... Steady

■ STEELMAKING operations remained at 93 per cent last week, advances in five districts being balanced by losses in five, while two were unchanged. In same week of 1939 the rate was 79.5 per cent; in 1938, 48 per cent.

Chicago—Advanced 1 point to 98.5 per cent. Three mills in the district are reported operating over 100 per cent of ingot capacity.

St. Louis—Steady at 80 per cent. Three mills are operating at 100 per cent.

Detroit—Suspension of another open hearth for repairs lowered the rate 4 points to 91 per cent. Two furnaces of the district's 26 are inactive.

Cincinnati—Off three points to 79 per cent, with little change anticipated this week.

Birmingham, Ala.—Increased 4 points to 97 per cent. Tennessee Coal, Iron & Railroad Co. added an open-hearth furnace at its Ensley works, making 23 open hearths active.

Buffalo—Unchanged at 90½ per cent for the fourth consecutive week. Bethlehem Steel Co. continues to operate 28 of 30 open hearths at its Lackawanna plant; Republic Steel Corp., eight of nine at its South Park avenue plant, and Wickwire Spencer Steel Co.,

three of four at its River road mill.

Central eastern seaboard—Advanced 1½ points to 92 per cent. The leading interest is operating above rated capacity.

New England—Gained 5 points to 80 per cent, with one works operating at 100 per cent for the third week.

Youngstown, O.—Off 3 points to 83 per cent, with three bessemer and 63 open hearths producing. Republic Steel Corp. took off three open hearths due to a rolling mill breakdown, but will add one furnace this week, increasing rate to about 84 per cent.

Pittsburgh—Up 1½ points to 88½ per cent.

Wheeling—Declined 1 point to 97 per cent.

Cleveland—Declined 1 point to 88 per cent, due to repairs. A higher rate is expected this week.

Fires Beehive Ovens

■ H. C. Frick Coke Co., Pittsburgh, has reopened its Phillips mine and is firing 400 beehive coke ovens, it was reported last week. Demand for coke from other United States Steel Corp. subsidiaries in the district was given as the reason, the action putting an end to considerable speculation as to how the excess coke would be produced. The ovens were in operation last fall, but have been idle since early this year.

■ The government will finance a plant at Philadelphia for the production of light armor plate. Plant will be located adjacent to that of Henry Disston & Sons Inc. and will bring total production capacity to 5000 tons monthly. The Disston company will operate the plant.

District Steel Rates

	Percentage of Ingot Capacity Engaged In Leading Districts		Same week	
	Week ended Sept. 21	Change	1939	1938
Pittsburgh	88½	+ 1½	75	38
Chicago	98.5	+ 1	78.5	43.5
Eastern Pa.	92	+ 1.5	59	33
Youngstown	83	- 3	82	48
Wheeling	97	- 1	88	54
Cleveland	88	- 1	84	48.5
Buffalo	90.5	None	72	49
Birmingham	97	+ 4	83	57
New England	80	+ 5	80	60
Cincinnati	79	- 3	71.5	65
St. Louis	80	None	66.5	48.5
Detroit	91	- 4	99	77
Average	93	None	79.5	48

MEETINGS

A.I.E.E. MEMBERS TO MEET IN CINCINNATI

■ A MEETING of the middle eastern district members of the American Institute of Electrical Engineers will be held in Hotel Netherland Plaza, Cincinnati, Oct. 9-11. Sessions on power transmission and distribution, aviation instruments and control will be held Wednesday; electrical machinery and industrial power applications Thursday; and selected subjects and single-phase motors Friday. Trips to the Newport Rolling mills and to the Andrews Steel Co., Newport, Ky., are scheduled for Thursday afternoon.

METALLURGISTS TO DISCUSS STEELMAKING PRACTICE

Chicago section of the American Institute of Mining and Metallurgical Engineers will hold its fall dinner meeting at the Electric club, 20 North Wacker drive, Chicago, Oct. 9. L. G. Graper, supervisor of steelmaking, Wisconsin Steel Works, will speak on "Forging Steel," and T. S. Washburn, assistant chief metallurgist, Inland Steel Co., on "Strip Steel."

CLEVELAND TOOL ENGINEERS WILL DISCUSS PLASTICS

Cleveland chapter, American Society of Tool Engineers, will hold its monthly meeting at Hotel Allerton, Cleveland, Oct. 11. Devoted to a discussion of plastics, the technical session will be preceded by a dinner.

TO APPRAISE MAJOR TRENDS AFFECTING DISTRIBUTION

Annual appraisals of the major economic trends affecting distribution will be presented at the Boston Conference on Distribution, Hotel Statler, Boston, Oct. 7-8.

ELECTROCHEMISTS TO MEET AT OTTAWA, CANADA

Electrochemical Society Inc. will hold its seventy-eighth general meeting at Ottawa, Canada, Oct. 2-5. Headquarters will be at the Chateau Laurier. Thirty papers will be presented at the sessions.

Convention Calendar

Sept. 24-25—Society of Automotive Engineers. National tractor meeting at Schroeder hotel, Milwaukee. John A. C. Warner, 29 West Thirty-ninth street, New York, is general manager.

Sept. 24-27—Association of Iron and Steel Engineers. Thirty-sixth convention and exposition at Stevens hotel, Chicago. Brent Wiley, 1010 Empire building, Pittsburgh, is managing director.

Sept. 26-29—National Association of Foremen. Seventeenth annual convention at Hotel Gibson, Cincinnati. H. G. Evans, Goodyear Tire & Rubber Co., Akron, O., is secretary.

Sept. 30-Oct. 1 — National Lubricating Grease Institute. Eighth annual convention at Stevens hotel, Chicago. George W. Miller, 498 Winspear avenue, Buffalo, is executive secretary.

Oct. 2-3—Farm Equipment Institute. Forty-seventh annual meeting at Edgewater hotel, Chicago. R. A. Jones, 608 S. Dearborn street, Chicago, is secretary.

Oct. 2-5 — Electrochemical Society Inc. Seventy-eighth general convention at Chateau Laurier, Ottawa, Canada. Dr. Colin G. Fink, 3000 Broadway, New York, is secretary.

Oct. 6-11—Chicago Exposition of Power and Mechanical Engineering, International amphitheatre, Chicago. International Exposition Co., Grand Central Palace, New York, is manager.

Oct. 7-8—Boston Conference on Distribution. Twelfth conference, Hotel Statler, Boston. Daniel Bloomfield, 80 Federal street, Boston, is manager.

Oct. 7-10—American Gas association. Twenty-second annual convention, Atlantic City, N. J. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 7-11—National Safety council. Twenty-ninth national safety congress and exposition at Stevens hotel, Chicago. W. H. Cameron, 20 N. Wacker Drive, Chicago, is managing director.

Oct. 8 — Army Ordnance association. Twenty-first annual meeting at the Waldorf-Astoria hotel, New York.

Oct. 9-11—American Institute of Electrical Engineers. Middle eastern district meeting, Hotel Netherland Plaza, Cincinnati. H. H. Henline, 33 West Thirty-ninth street, New York, is secretary.

Oct. 14—Society of Automotive Engineers. Annual dinner, Hotel Commodore, N. Y. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary.

Oct. 14-16 — American Gear Manufacturers association, twenty-third semi-annual meeting, Skytop Lodge, Skytop, Pa. J. C. McQuiston, 602 Shields building, Wilkingsburg, Pa., is secretary.

Oct. 15-18—American Institute of Steel Construction. Eighteenth annual convention, Greenbrier hotel, White Sulphur Springs, W. Va. V. Gilmore Iden, 101 Park avenue, New York, is secretary.

Oct. 16-18—Porcelain Enamel Institute. Fifth annual forum, University of Illinois, Urbana, Ill. Charles C. Pearce, 612 N. Michigan avenue, Chicago, is managing director.

Oct. 17-29—American Society of Tool Engineers. Semiannual meeting, Cincinnati. Ford R. Lamb, Boulevard Temple building, 2567 W. Grand boulevard, Detroit, is secretary.

Oct. 21-22—Associated Machine Tool Dealers of America. Annual convention, Dayton Biltmore hotel, Dayton, O. Thomas A. Fernley Jr., 505 Arch street, Philadelphia, is secretary.

Oct. 21-25—American Institute of Mining and Metallurgical Engineers. Fall meetings, Iron and Steel and Institute of Metals divisions, Hotel Statler, Cleveland. A. B. Parsons, 29 West Thirty-ninth street, New York, is secretary.

Oct. 21-25—American Society for Metals. Twenty-second national metal congress and exposition, Public auditorium and Hotel Statler, Cleveland. W. H. Eisenman, 7301 Euclid avenue, Cleveland, is secretary.

FINANCIAL

CARPENTER STEEL EARNS \$1,458,943 NET PROFIT

■ CARPENTER STEEL CO., Reading, Pa., reports net profit for year ended June 30 was \$1,458,943, after provision of \$396,531 for depreciation, loss on property retired and extra compensation for officials. Net income was equal to \$4.05 per capital share and compared with net earnings of \$317,309 or 88 cents per share in the preceding year.

Net sales for the period aggregated \$9,898,916, nearly 89 per cent greater than \$5,251,801 in the fiscal year ended June 30, 1939.

Improvements costing approximately \$250,000 were made during the year. Modernization of the company's round wire department and its new electrical power line facilities, authorized by the board of directors, are in process of construction. Estimated cost is \$800,000.

Cash dividends of \$2.50 per share were paid during the year to holders of the 360,000 capital shares authorized and issued. Taxes accrued and paid totaled \$642,671, more than two and a half times as much as in the preceding year when the aggregate was \$234,516. This was equal to \$1.79 per share, against 65 cents per share in year ended June 30, 1939.

WESTINGHOUSE'S AUGUST NET INCOME TOTALS \$1,614,698

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., earned \$1,614,698 net profit in August, compared with \$853,045 in the month last year and \$1,755,436 in July. For the three months ended Aug. 31 net income was \$4,814,975, after taxes and charges, and equal to \$1.80 per share on combined 7 per cent preferred and common stocks. This compared with \$3,200,491 net profit or \$1.20 per share earned in the period last year.

Net earnings for eight months ended Aug. 31 aggregated \$13,207,146, against \$7,965,673 in the 1939 period. Respective profit per share was \$4.94 on combined preferred and common, compared with \$2.98.

Wages and salaries of Westinghouse employes will be adjusted upward 10 per cent this month, in accordance with the company's wage and salary adjustment plan. Compensation, under the system, is adjusted each month in proportion to average earnings the preceding three months. Bonus last month was 11 per cent.

TIMKEN-DETROIT AXLE CO.

Timken-Detroit Axle Co., Detroit, reports consolidated net profit in year ended June 30 was \$3,649,059, after depreciation, amortization and federal income taxes, including \$1-

100,000 reserve for federal excess profits tax applicable to income since Jan. 1, 1940. This was equal to \$3.69 per common share outstanding and compared with net profit of \$1,484,106 or \$1.50 per share in the preceding fiscal year.

The company has changed its fiscal year to end June 30. Earnings now reported for the year ended June 30, 1940, include earnings already reported for the calendar year ended Dec. 31, 1939.

DIVIDENDS DECLARED

Molybdenum Corp. of America, Pittsburgh, 25 cents a share on common, payable Oct. 1 to record of Sept. 16. Similar amounts were paid in July and March.

Republic Steel Corp., Cleveland, \$12 per share on the company's 6 per cent cumulative convertible preferred, payable Oct. 15 to record of Sept. 30. Dividend of \$1.50 per share had been previously declared, payable Oct. 1. These will represent full payment of all dividend accumulations on the stock to and including Oct. 1.

Preparedness Stimulus Through 1942 Forecast

■ National defense preparations will stimulate industrial production for the next two years, believes Col. Leonard P. Ayres, vice president, Cleveland Trust Co.

War industries at present employ 326,000 and have weekly payrolls of nearly \$12,000,000, the economist points out in the bank's monthly business summary.

He notes that payrolls have been increasing more rapidly than has employment. "At the beginning of 1938 the average pay for a worker a week amounted to \$28.19, while in July of this year it had increased to \$36.08. Part of the increase has resulted from the employment of larger proportions of skilled workers and part of it from payments for overtime work.

Colonel Ayres said that although the increase in army and navy expenditures has been much slower than in 1917, "nevertheless the placing of munitions contracts, and the preparation to place them, have been going forward at so considerable a pace that important increases in employment, construction, in the demands for materials and in actual production are sure to be in evidence in the remaining months of the year. That stimulus to industrial production will continue not only through the rest of this year, but at least through next year and the year after that.

"The implements of war are in no sense income-producing . . . but will temporarily operate to lift the national income," he said.

"Take Politics Out of Defense Program; Give Board Full Power"

■ POLITICS must be removed from industrial mobilization or else its successful consummation will be dangerously delayed and perhaps fail, the National Industrial Advertisers' association was told by Raoul Desvernine, president, Crucible Steel Co. of America. He addressed the association at its annual conference in Detroit, Sept. 20.

"Why should we fear that we won't proceed with industrial mobilization by voluntary co-operation and the stimulation of industry?" asked Mr. Desvernine. "Why should we even suspect coercive methods? The answer is that we have found out that the New Deal doesn't understand the processes of industry and thinks that production can be attained by coercion. The record of the past seven years proves this assertion and it also demonstrates that coercion hasn't worked."

Praising work of the World war industries board, Mr. Desvernine pointed out it had not become completely efficient until it was reconstituted in 1918 with full control over all procurement activities of the government. Even though all power was centralized in it, business did not become timid because industrialists were willing to subordinate business in the national interest to administrators in whom they believed and trusted, said Mr. Desvernine.

"In spite of this experience," he continued, "our present defense commission is made purely advisory. Policy making and administrative power is kept in the hands of the President. We have ignored the lessons of the last war that irrespective of the competency and skill of the members of the war industries board, they were hampered in their effectiveness if they were denied power."

A Full-Time Job

Declaring management of the defense program was a full-time job for even a highly trained and experienced industrial manager, Mr. Desvernine asserted the President cannot devote himself to such a comprehensive job free from all considerations of politics. This especially in light of the President's current campaign for a third term. Mr. Desvernine further pointed out that experience denied the argument retention of those powers by the President was for purely efficiency purposes.

Mr. Desvernine remarked upon controversy and strife which politics provoke, and stressed the ease with which the administration could

remove national defense from political controversy. "Certainly President Roosevelt," he said, "can trust his own chosen representatives—the present members of the defense commission and their able and trained assistants—and I am certain that industry not only trusts them, but will accept their leadership. Government and industry wholeheartedly accepted Baruch in 1917, and I submit, would do likewise with Knudsen and Stettinius in 1940."

Among other deterrents to smooth and swift work of preparations for national defense, Mr. Desvernine mentioned business' inability to adjust its plans and operations to rules subject to momentary change without notice. Business, he said, is a practical thing controlled and directed by realities and ascertainable potentialities.

In closing Mr. Desvernine declared greater and freer co-operative planning among industrial groups without suspicion of conspiring against the public interest and without fear of prosecution must be permitted. Such consultation and co-operation, he said, will prevent useless and wasteful duplication of facilities, will lower production costs and result in more speedy and efficient output.

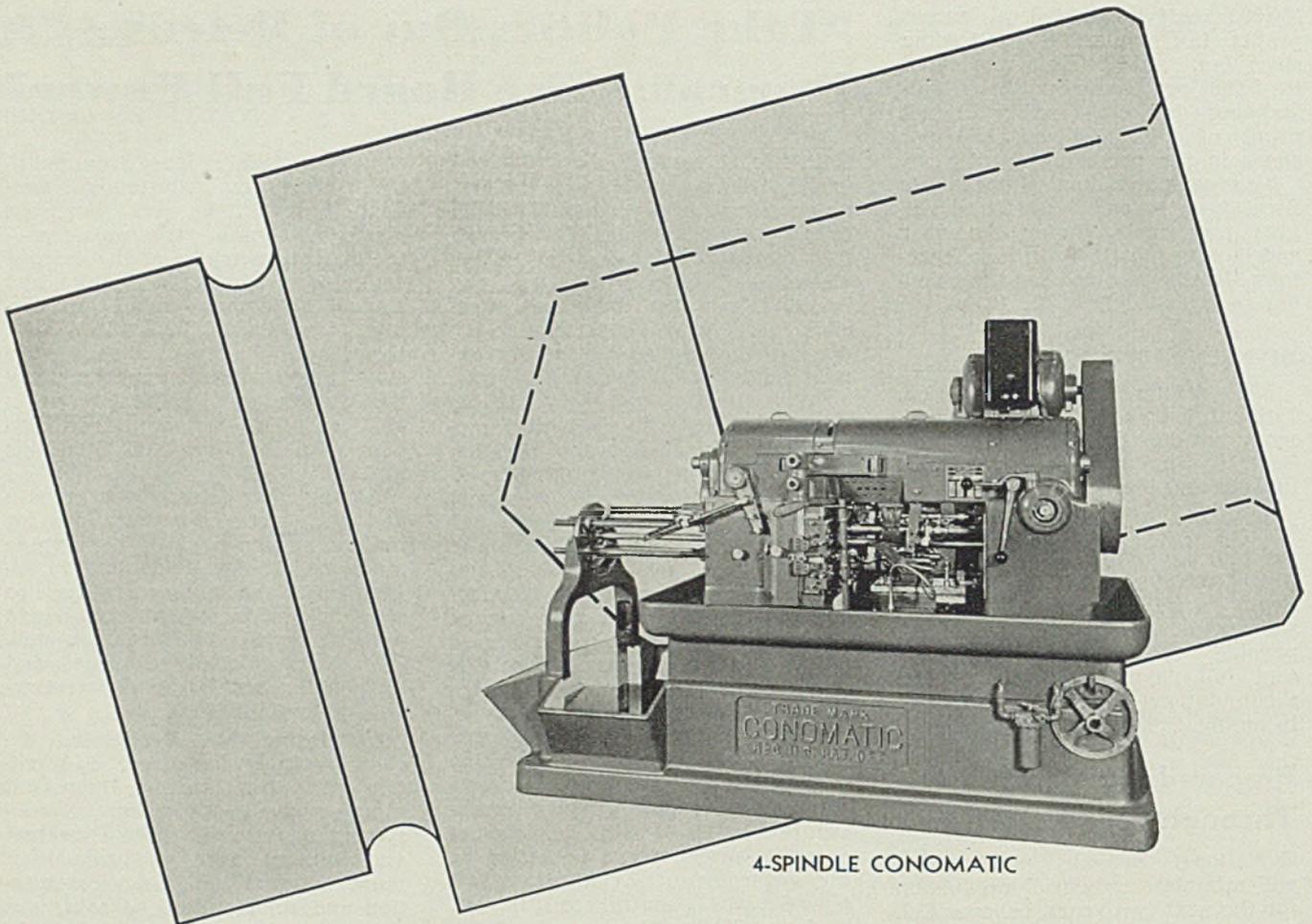
Industry Draft Not Necessary

In answer to uncertainty concerning the government's attitude toward industries essential to the defense program, Robert P. Patterson, assistant secretary of war, told the association: "No responsible official in Washington prefers governmental operation of industrial plants to private operation."

The war department, he explained, does not believe the industrial conscription or plant-commandeering section of the draft law will have to be invoked in the present armament program. "There is every indication," he declared, "that industry is most willing to cooperate."

Britain Reports Public Scrap Drive Successful

■ Campaign inaugurated some months ago in Great Britain to have the public turn over to the government all available iron and steel scrap is successful, according to Vice Consul M. A. Colebrook, London. However, it is said the situation is less satisfactory in industrial scrap from old buildings, mines, piers, and abandoned railway tracks.



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Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

Amended Excess Profits Tax Bill Is Passed by Senate.

Commission Seeks To Locate, Dissolve Bottlenecks.

\$50,000,000 in WPA Defense Appropriations Since July 1.

Bethlehem Asks Review of War Profits Cases Be Denied.

WASHINGTON

■ EXCESS profits tax bill, in the house version of which the senate made two basic changes, was passed by the latter body Sept. 19 and immediately sent to conference. Hope was expressed the bill might be completed in the next few days that congress might either adjourn or recess the latter part of this week.

Designed to speed the national defense program, the bill increases existing corporation taxes and imposes an excess profits levy. The treasury, it is reported, has disavowed the bill, would have preferred treating as excess profits all earnings in excess of a fixed rate of return on invested capital. This rate would have been determined regardless of the company's past earnings record, and would have hit directly at the high-earning companies. Both the house and senate had rejected this theory of taxation.

As approved by the senate, the measure generally limits excess profits taxes to earnings in excess of the average for any three of the four years 1936-39 inclusive. It was based on the assumption any increase will be attributable either directly or indirectly to government defense spending. It provides for additional revenue by increasing the normal corporate income tax to 24 per cent, 3.1 per cent higher than at present. Industries producing strategic minerals would be exempt from the excess profits tax, as would those which earned not more than 8 per cent on currently invested capi-

tal during the taxable year. All corporations are allowed a flat excess profits exemption of \$10,000.

Just before passage the senate added to the bill the Connally war profits amendment, setting up a schedule of wartime income tax schedules ranging to 80 per cent on top surtax brackets. Operative only when the United States was at war, the amendment would fix the normal income tax on individuals at 10 per cent and at 35 per cent for corporations. Excess profits of corporations would be taxed up to 60 per cent on profits in excess of 5 per cent. This proposal is expected to be rejected by the house conferees.

The senate bill included provisions, adopted also by the house, suspending existing profit limitations on government contracts for construction of warships and airplanes and permitting corporations to charge off against earnings over a five-year period the cost of defense manufacturing facilities completed subsequent to Jan. 1, 1940.

The excess profits tax bill, as approved in the house, allowed corporations to compute their excess profits and excess profits taxes under either the invested capital or average earnings methods. Severe penalty taxes, however, would be imposed upon companies electing the latter.

Persons watching the national defense commission report that body is co-operating closely with both industry and trade associations. The

commission is making an effort to find where defense bottlenecks exist and to break them as soon as possible.

It is thought one way to minimize bottlenecks is to obtain as accurate a picture as possible of the relationship between government requirements for defense and industry's ability to meet those demands with a minimum of disturbance to civilian needs. Because capacity to produce is dependent upon such valuable factors as time, choice, spread, specifications, physical characteristics of plants, labor supply and management ability, mere statistical studies cannot achieve adequate results.

Defense commission officials believe that what is most needed is a pooling of practical experience which will make business judgment available to the government.

WPA DEFENSE PROJECTS EXCEED \$50,000,000 TOTAL

Expenditure of federal WPA funds totaling more than \$50,000,000 on projects of direct value to national defense was authorized between July 1 and Sept. 1, Howard O. Hunter, acting commissioner of work projects, announced last week.

Improvement of airports, army and navy reservations, national guard armories and rifle ranges and other defense facilities approved during the period total \$42,759,594, Mr. Hunter said. Additional \$9,781,340 was approved for vocational training to prepare skilled workers for defense industries.

Forty-nine projects, carrying a total authorization of \$7,831,828 in WPA funds, have been approved since Aug. 15. Projects are distributed over 25 states, the District of Columbia, Puerto Rico and Hawaii. California and Florida each have five, Pennsylvania four, Arkansas and New Jersey three each.

Largest share of funds approved

since mid-August, \$4,545,211, will go for projects sponsored by the army. Almost half is for two projects in Puerto Rico, where extensive construction work is planned at Ft. Buchanan and Borinquon air field.

WEIRTON FILES BILL OF EXCEPTIONS TO NLRB ORDER

Weirton Steel Co., Weirton, W. Va., last week filed a 129-page bill of exceptions charging the national labor relations board was biased and prejudiced in its July 12 proposed decision finding the company had violated the Wagner Labor act.

Attorneys for Weirton, a National Steel Corp. subsidiary, challenged in their exceptions the board's right to make any decision in the case. This stand was based on the allegation the board issued a complaint against the company in an effort to aid the Steel Workers' Organizing committee, a CIO affiliate which had filed unfair labor charges, to organize Weirton employees.

The board's ruling had set Sept. 17 as the deadline for compliance with its order directing the company to disestablish independent organizations among its 12,000 workers at Steubenville, O., and Weirton; to cease discouraging membership in the SWOC; and to reinstate with back pay 17 employees discharged in 1936.

ESTABLISH PROCUREMENT DIVISION LIAISON OFFICE

Establishment of a liaison office between 43 field procurement officers and the procurement division in Washington was recently reported by the treasury department. Known as the field inspection division, the new office began operations Sept. 3.

Its primary function is co-ordination, simplification and standardization of field procurement officers' activities. These officers, located advantageously throughout United States, make purchases for emergency relief and the national youth administration. Their purchases, from road building and construction materials to clothing and foodstuffs, aggregated \$233,700,000 in 1939.

Field inspection division will conduct regular and periodic surveys of the various offices to facilitate its work. Surveys will be performed by six or seven men trained in all phases of procurement work.

BETHLEHEM PROTESTS REVIEW OF 1918 WAR PROFITS CASES

Bethlehem Steel Corp. has petitioned the United States Supreme Court to refuse the justice department's request for a review of two cases, started in 1925 and 1926, involving profits on World war shipbuilding contracts. In one case

Bethlehem sued the government for profits not paid to it, while in the other the government sued the corporation for recovery of alleged excessive profits already paid. About \$13,365,000 is involved. The government lost both cases in the lower courts.

Frederick H. Wood, Bethlehem attorney, told the court:

"There is no authority in law or elsewhere which would warrant the adoption of the suggestion made in the petition that conditions of our present national emergency are such as to require this court to define the limitations surrounding the profits which a government contractor may lawfully receive or retain in time of war.

"Carried to its logical conclusion, the contention of the government would appear to be that this court, independent of any statutory limitation of profits, should declare that, as a matter of law, no government contractor, in time of war or at any other time—no matter what the terms of his contract may be or what benefits may be derived therefrom by the government—may receive or retain any profits in excess of that which the courts shall subsequently determine to be reasonable.

"No authority is cited in support of that startling contention, which, if correct, would transfer the determination of prices in government contracts from the executive to the judicial department and the determination of questions of policy, in respect of such contracts, from the congress to the courts."

HILLMAN LAUDS NEGOTIATED DEFENSE CONTRACT POLICY

Concerning President Roosevelt's recent message on negotiated national defense contracts, Sidney Hillman, in charge of the labor division, national defense advisory commission, last week said:

"I am confident that this action of the commission is most far-reaching in our defense effort and should deal adequately with the problems which are properly of deep concern to labor."

Adoption of this policy, said Mr. Hillman, should lead to the following results: Saving of time that would be required if existing facilities were expanded in specific areas; lower overhead costs due to full operation and consequent lower costs to the government; increased profits to plants now running at less than efficient operating levels.

Protection of employers with good labor standards against unfair competition of employers with inferior standards; revitalizing of ghost towns where all sources of income have dried up because of plant shutdowns; provision of a semiskilled

and skilled labor supply where the labor force has no opportunity for employment near home; opening of reservoirs of unused skills now employed on operations of unskilled and semiskilled nature; and absorption of older workers, with skill, who cannot be easily moved to other areas.

These in turn, according to Mr. Hillman, should curtail expenditures for relief; increase local tax income in communities where orders are placed; revitalize and make productive unemployed who have no other opportunities for employment except through the WPA and NYA; and reduce the role of the speculator in government contracts.

In making his report to members of the labor policy advisory committee, Mr. Hillman emphasized that all work carried on as part of the defense program should comply with federal statutory provisions affecting labor wherever such provisions are applicable.

ITALY PLANS 2,500,000-TON STEEL PRODUCTION PROGRAM

Italian autarchic program calls for annual production of 2,500,000 metric tons of crude steel, according to the American commercial attache, Rome. Productive facilities are believed adequate, having virtually achieved this goal over the first six months of 1939 when 1,156,302 tons was produced, for approximately 2,300,000 tons on an annual basis.

Problem, therefore, is not facilities but raw materials. It has been estimated domestic sources of iron ore, pyrites and scrap are normally sufficient to provide 1,000,000 tons of crude steel annually—some 40 per cent of the program figure which is held to represent Italy's normal requirement.

Balance must be imported, as iron ore, scrap, and other iron and steel materials. In first six months of 1939 total Italian imports of iron and steel totaled 508,889 tons, with 392,796 tons scrap. Ninety per cent of these imports reached Italy by water, almost entirely by way of Gibraltar, now closed to Italian shipping.

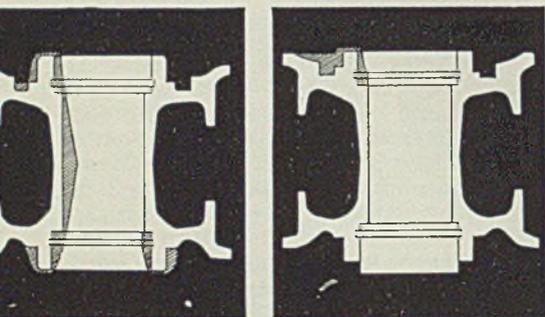
HEARINGS ON BOILER SHOP WAGES TO BE HELD OCT. 1

Public contracts board will hold a hearing in Washington, Oct. 1, to take testimony upon which findings of fact will be made to assist the secretary of labor in determining the prevailing minimum wages in the boiler shop and related industries. Held in room 3229, department of labor building at 10 a. m., the hearing will be in accordance with section 1(b) of the public contracts act.

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1ST CHUCKING

Operations: bore, turn, sweep,
 chamfer face, ream; Fin-
 12 distinct surfaces.

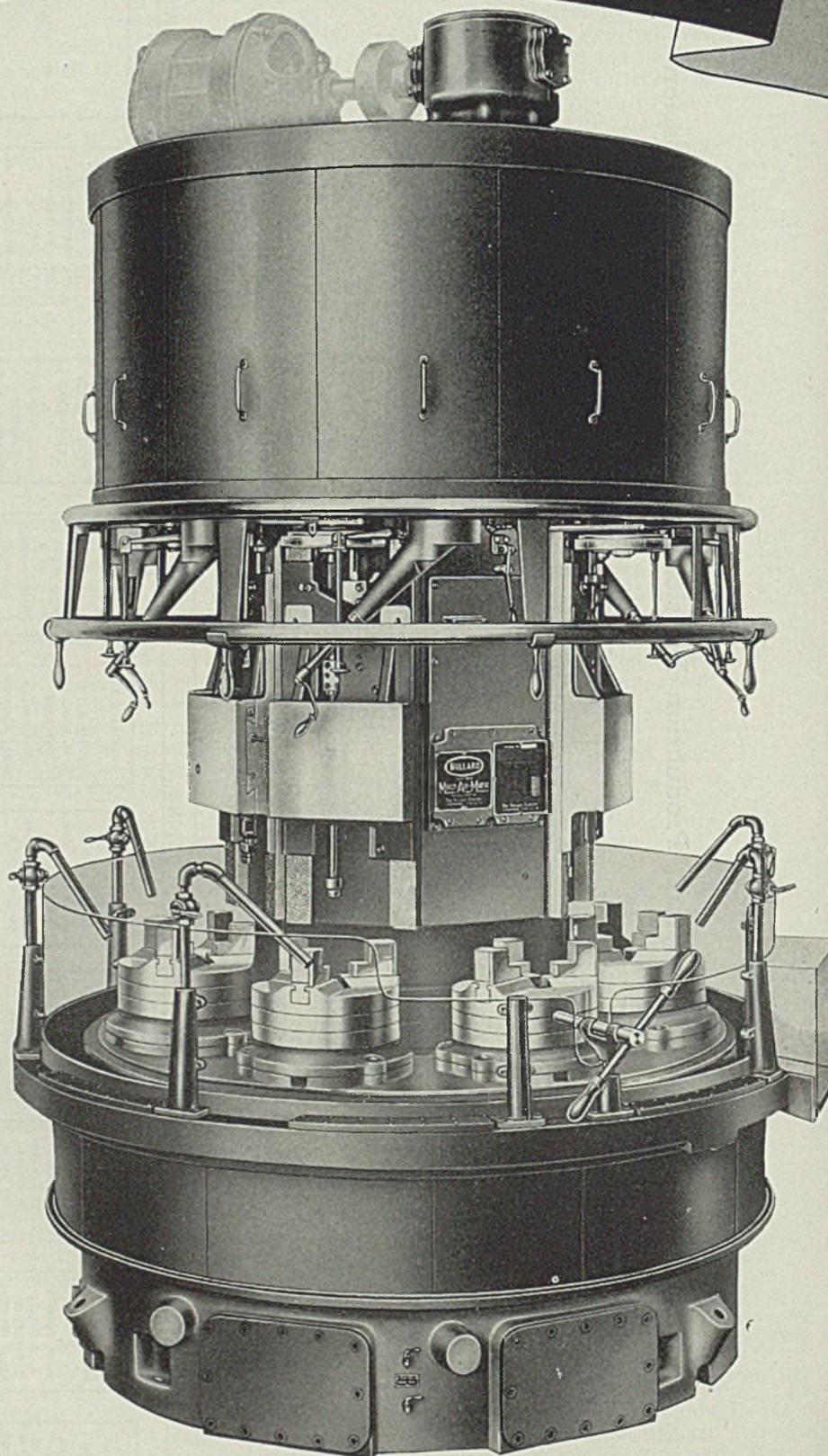
R.P.M.'s at the 7 working sta-
 tions range from 48 to 134; Cut-
 ting speeds vary from 38 ft. per
 min. to 140 ft. per min.; Feeds
 from .0067" to .0508".

2ND CHUCKING

18 operations; turn, sweep,
 groove bore, groove, face
 chamfer ream; Finishing 11 dis-
 tinct surfaces.

R.P.M.'s at the 7 working sta-
 tions range from 48 to 103; Cut-
 ting speeds vary from 38 ft. per
 min. to 81 ft. per min.; Feeds
 from .0096" to .0476".

The part, sketched in profile, is approximately
 8" wide and 7" high; shaded areas show sur-
 faces finished in each chucking.



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Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Sales Campaigns Begin Battle Over Transmissions.

Operation of New Fluid Drives Described.

Packard Makes 1941 Bow in Elaborate Show.

New Model Shipments Substantially Above Last Year.

Designs Resilient "Crash Pad" for Instrument Panels.

DETROIT

■ "GOODBYE MR. CLUTCH," will be the headline of one of a new series of advertisements which Oldsmobile will feature shortly, plugging its Hydra-Matic drive for 1941 models, and it will be the opening gun in the battle of transmissions, which is slated to be unleashed in full force for the 1941 campaign. Standard bearers in the battle, as of present indications, will be Olds, Cadillac, Dodge, De Soto, Chrysler and Packard, with Hudson possibly coming in later on.

Although Olds offered its automatic transmission last year, production difficulties at the Detroit Transmission division prevented any concerted sales effort since the demand far exceeded the supply, despite production of some 25,000 units during the year. Now, however, the lid is off and Olds is equipping half its production with the Hydra-Matic drive, hoping to move about 100,000 of these jobs in the coming year. Promotional effort will be directed toward showing the difference between the Hydra-Matic drive and other types of automatic and semiautomatic transmissions.

The campaign may see plenty of biting in the clinches and strangleholds. For example, the high spot of a playlet staged at the Olds sales convention was a scene in which the owner of a car equipped with a competing make of transmission complained that when he started in high gear "old men in wheel chairs flew past him."

The Olds automatic drive is practically unchanged from the design

used last year, except for a new linkage on the starter switch which automatically kicks the shift lever into neutral position when the engine is being started. This was made to overcome complaints of an occasional driver who went through the back of his garage because of inadvertently starting his motor with the transmission in gear.

For those unfamiliar with the mechanism it should be explained that the shift lever on the steering column has four positions—high, low, neutral and reverse—and the clutch has been eliminated entirely, a fluid coupling taking its place. Under normal driving, the lever is set in the "high" position and the gear ratios change automatically through first, second, third and fourth, or direct, drive positions.

Accelerator Controls Gear Shift

Chief competitor of the Olds transmission is the Chrysler fluid drive, also available on certain Chrysler models last year, but extended this year to Dodge and De Soto as well. To meet the added challenge of automatic gear changing, a new transmission has been developed—a semiautomatic four-speed type known as the Simplimatic transmission. This unit provides two sets of gear ranges, high and low, selected by the shift lever and using the conventional clutch pedal for the shift. However, the change in each range, from first to

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second or from third to high or direct drive, is accomplished by removing the foot from the accelerator pedal for an instant. This actuates a single vacuum controlled diaphragm which operates a shifter fork at the forward end of the transmission.

As a further control, the timing of gear changes is regulated by a centrifugal governor driven by the transmission countershaft. The governor operates an electric solenoid which in turn moves a latch in the diaphragm. The governor is set to allow a shift from third to high at 15 miles per hour and an automatic return to third when the car speed falls below 13. The shift from first to second is made at about 8 miles per hour.

With this arrangement no overdrive is used, the transmission itself being a form of overdrive, or perhaps more accurately, underdrive.

Manual shifting continues to be made by means of the shift fork at the center of the gear box. When the control lever is in the high range, the car will start in third gear, with ratio of 1.55 to 1 at the gears or ample for most driving conditions. In the low range, first gear ratio is 3.068 to 1 and second 1.98 to 1.

The gearbox is arranged to free-wheel in first and third gears, and is locked up in second and fourth. Power flow is from the engine, through the fluid drive, then through the clutch and on through the transmission and into the propeller shaft. A manual lock-out is provided to lock the transmission in second or high gear, depending upon the setting of the shift lever, to permit starting the engine when the car is being towed or pushed.

This new transmission will be available with fluid drive on Chrysler and De Soto models. Dodge apparently will use the conventional transmission with fluid drive, plus the added feature of a vacuum booster on the shift lever for easier manipulation. De Soto also offers a vacuum booster on the shift lever,

as does Plymouth, both optional equipment.

So you can look for a lively battle, with printer's ink, between the Hydra-Matic and the Simplimatic devotees. Looking at the two impartially, it appears that drivers will be able to accustom themselves more readily to the Simplimatic, although the Hydra-Matic relieves the driver from all shifting responsibility. However, he should be cautioned not to try racing his motor when caught in a traffic jam.

Packard is coming into the fray later on this season with an "electromatic" clutch, which is another system to shift gears automatically and, as Packard publicists say, "to let your left foot loaf."

Press and dealer preview of 1941 Packard models last week hit a new high in entertainment value. Main festivities were at the Packard 1200-acre proving ground near Utica, Mich., where 5000 dealers and press representatives were transported in a fleet of buses to hear an elaborate and well-rehearsed stage presentation featuring George Olsen's orchestra, comedian Lou Holtz, a bevy of 16 dancing beauties and several other professional entertainers. The music and entertainment were cleverly woven around presentation of the new Packard models. A special grandstand seating 5000 and a full stage were erected on the proving grounds and some two dozen cars, filled with expertly costumed stage performers, were whirled around before the audience in amazing fashion. Clyde M. Vandeburg, public relations director, and sales executives Packer and Slack were responsible for the well-staged affair.

Now the "Flying Scot"

Packard retains its characteristic hood and radiator shell lines, but has lengthened out hoods, modified lines of rear ends and introduced a number of novel two-tone color effects. Particularly striking at the preview were some of the special bodies designed for the custom series this year. Regular models include four series of cars as in the past year—the 110, 120, 160 and 180. The 180 series incorporates hydraulic window regulators described in these columns recently.

Nash has issued details on the Ambassador 600, the company's new entrant in the low-priced field. Salient features include gasoline economy of 20 to 30 miles per gallon; unitized body construction with integral frame, all welded into a single, rigid unit; new spring suspension with coils on all wheels; and two-way ball bearing steering with 33-foot turning radius. Motor is appropriately dubbed the "Flying Scot" and continues design used on other Nash engines of casting

inlet manifolds inside the head. Motor develops 75 horsepower at 3600 revolutions per minute, has bore of 3 1/4 inches and stroke of 3 3/4 inches.

The front suspension system employs giant kingpins, 20 inches long, set vertically and supported at the top by a horizontal steel tube and at the bottom by a heavy front suspension bridge-type truss which is a part of the body structure. A collar rides up and down the lower section of each kingpin on six caged roller bearings, carrying the front wheel spindle at its lower end. The upper end supports a resilient coil spring which in turn carries the body weight on a tapered roller bearing. Direct-acting tubular shock

the same as in 1940 but pistons, of cast alloy iron with slipper skirt, have a flat instead of crowned top which in connection with changes in shape of the combustion chamber and increase in the compression ratio, raises horsepower from 85 to 90. Rocker arms are now of pearlitic malleable iron and are Granodized after boring to minimize scuffing of bearing surface.

George W. Walker, Detroit industrial designer, has evolved a new safety treatment for instrument panels which he believes will go a long way toward eliminating injuries incurred in collisions. The panel features a styled, streamlined crash pad, similar to pads used in airplanes to protect pilots. It has a base of resilient sponge rubber with maximum thickness of 3 inches and covered either with leather in colors which harmonize with interior upholstery, or with other suitable material. Extending across the top of the panel from one end to the other, the pad can be either a built-in feature or a separate accessory; in the latter case it can be buttoned onto the top of the panel easily. Theory is that when occupants of the car are thrown forward in a collision they will strike the resilient crash pad rather than steel surface of panel.

1941 Sales Above Last Year

Early sales reports on 1941 models are highly favorable. Domestic retail deliveries of Buick in the first ten days of September totaled 5866, compared with 1177 in the same interval last year. Pontiac delivered 3845 cars in the same ten days, compared with 1341 in 1939, a particularly good showing in view of the fact new car models had not been announced officially. Up to Sept. 7, Hudson had shipped 14,509 new models, over 5000 of them in the last two weeks of this period. Shipments to date are up 127 per cent over last year. Studebaker's September production will exceed the same month last year by 43 per cent.

Sudden and untimely death Sept. 12 of Theodore F. MacManus, noted advertising counsel for car manufacturers for thirty years, was a bad break for Willys. MacManus recently had been signed as promotion counsel in connection with Willys' new Americar, to be introduced shortly. Retired for the past two years, he had played a vital part in many spectacular merchandising programs, and he had conceived such phrases as "Body by Fisher," "Look at All Three," and others which have held the spotlight in car selling fields. He was the author of several books, including *Men, Money and Motors*, and was widely known for his philanthropy.

Automobile Production

Passenger Cars and Trucks—United States and Canada			
By Department of Commerce			
	1938	1939	1940
Jan.....	226,952	356,692	449,492
Feb.....	202,597	317,520	422,225
March....	238,447	389,495	440,232
April....	237,929	354,266	452,433
May.....	210,174	313,248	412,492
June....	189,402	324,253	362,566
July.....	150,450	218,494	246,171
7 mos....	1,455,951	2,274,348	2,785,611
Aug.....	96,946	103,343	.....
Sept....	89,623	192,678	.....
Oct.....	215,286	324,688	.....
Nov.....	390,405	368,541	.....
Dec.....	406,960	469,120	.....
Year....	2,655,171	3,732,608	.....
Estimated by Ward's Reports			
Week ended:		1940	1939†
Aug. 24		23,732	18,365
Aug. 31		27,645	25,240
Sept. 7		39,665	26,865
Sept. 14		66,615	41,245
Sept. 21		78,820	53,950

†Comparable week.

absorbers operate parallel to the kingpin. Rear suspension embodies two long coil springs, controlled by direct-acting shock absorbers set inside the coils, an idea introduced on front suspensions last year by Hudson. The larger six and eight-cylinder Nash models also use front shock absorbers mounted inside coil springs, rear springs being of the leaf type.

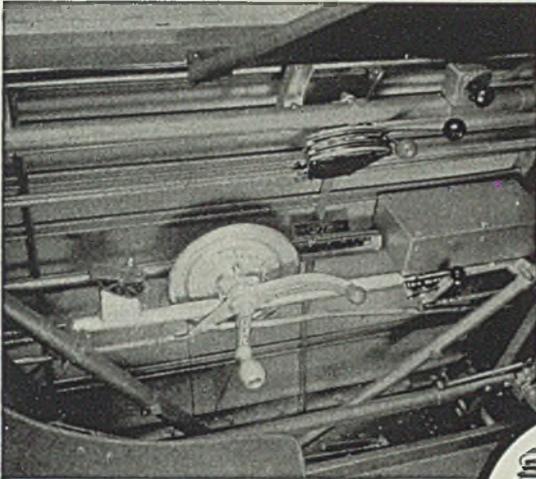
Chevrolet models for 1941 went on display Saturday. One mechanical innovation of interest is the provision of a reversing switch which, at each operation of the starter, reverses the direction of the current through the ignition breaker points. This tends to equalize the deposition of metal from one breaker point on the other and so prolongs life and efficiency of points.

Bore, stroke and piston displacement of the Chevrolet engine are

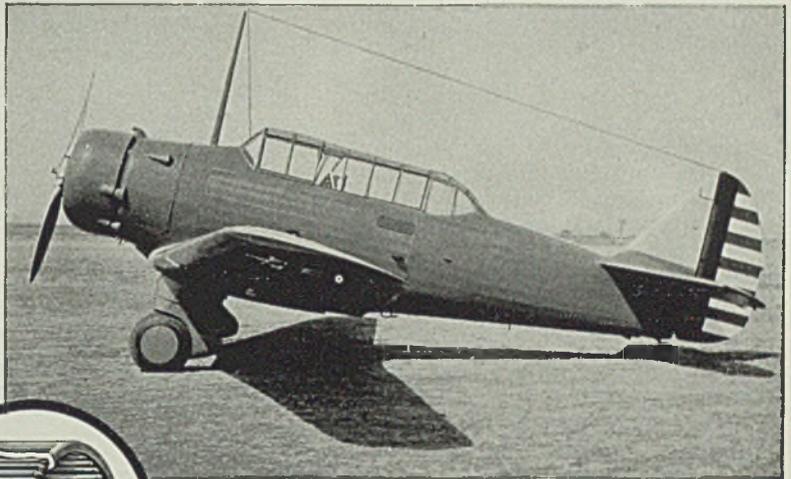
TORRINGTON NEEDLE BEARINGS

simplify control designs on

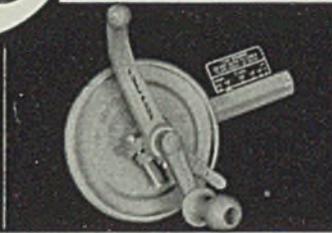
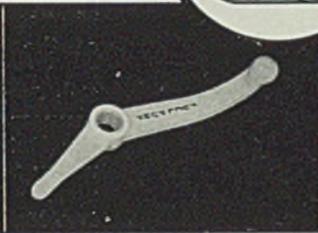
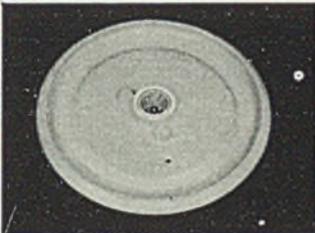
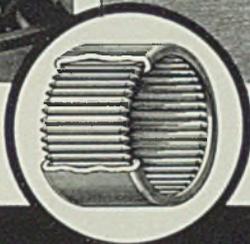
NORTH AMERICAN U. S. ARMY "TRAINERS"



Torrington Needle Bearings were selected for this Elevator Trim Wheel and Fuel Pump Handle, because they give the necessary freedom of operation obtainable only with anti-friction bearings.



On North American Aviation's U. S. Army training planes, like the one above, Torrington Needle Bearings at vital control points aid student pilots in mastering the intricacies of military flying.



Compact designs and reduced weight in surrounding members are two of the Torrington Needle Bearing's features clearly illustrated in the assembly parts of this aircraft control unit.

ASSURANCE of fast, smooth operation is a "must" in aircraft design. This is particularly true in the case of manual controls. At such points, anti-friction bearings are vitally necessary, yet the bulk and weight of conventional bearings frequently make their use impractical.

In Torrington Needle Bearings, engineers of the North American Aviation Company found the answer to their needs. Says their report: "In our trainers, built for the U. S. Army, we find it advantageous to employ Torrington Needle Bearings in the controls such as the hand fuel pump operating handle, trim tab control wheels and certain bell-cranks.

"And," they add, "because the outside diameter of the Torrington Bearing is comparable to a plain bushing, yet with a lubrication capacity so high, and

lower coefficient of friction so far in excess of the plain bushing, we employ Needle Bearings where space will not permit the use of other types."

Where space, weight, load capacity and, for that matter, costs, are important factors, the application of Torrington Needle Bearings frequently offers a sound solution to design problems. The Torrington Engineering Department will be glad to work with you in incorporating the advantages of Needle Bearings

to your product. For information, send for Catalog No. 10 For Needle Bearings to be used in heavier service, consult our Engineering Department for special bearing designs.

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

MEN of INDUSTRY

■ W. RICHISON SCHOFIELD, since 1928 chief engineer, Leeds & Northrup Co., Philadelphia, has been appointed director of engineering. John W. Harsch, assistant chief engineer, has been advanced to chief engineer, and Mr. Harsch's former position has been filled by John F. Quereau.

Mr. Schofield has been associated with the company 24 years. An authority in pyrometry and automatic control, he holds important patents on devices in these fields. He is an active member of the committee on industrial instruments and regulators, American Society of Mechanical Engineers, and the committee on electrochemistry and electrometallurgy, American Institute of Electrical Engineers. Mr. Harsch joined the company in 1924, becoming assistant chief engineer in 1928. He is vice chairman, Philadelphia chapter, American Society for Metals, and chairman, subcommittee on life testing nickelchrome resistor materials, American Society for Testing Materials. Mr. Quereau, identified with the company since 1929, is the inventor of a number of thermocouple and resistance thermometer devices, and an active member of American Society for Metals.

Ernest L. Mawhinney, personnel director, Jessop Steel Co., Washington, Pa., has been appointed safety director, in addition to his duties as personnel director.

Herbert E. Smith has been named vice president, Vulcan Rivet & Bolt Corp. Inc., Tarrant, Ala., and has taken over the duties of the late W. C. Martin, president.

Daniel E. Igo, formerly associated with the alloy sales division of Lukens Steel Co., Coatesville, Pa., has become identified with Graver Tank & Mfg. Co. Inc., East Chicago, Ind., as sales and promotion engineer, specializing in fabricated stainless and composite steels. He will cover the eastern territory for the Graver organization and his headquarters will be at the company's New York office.

James N. Davis, since 1937 assistant to the director of personnel in the schools of engineering and science at Purdue university, has resigned to become assistant director of personnel, Illinois Tool Works, Chicago.

John E. Mateer, open-hearth melter foreman of Lukens Steel Co.,



W. R. Schofield



John W. Harsch



Daniel E. Igo

Coatesville, Pa., since 1927, has been promoted to assistant open-hearth superintendent. He succeeds Herman J. Hofmann, recently named open-hearth superintendent. Mr. Mateer joined Lukens in March,

1907, as a door boy in the open-hearth department. He worked successively in the open hearth as second helper and first helper until 1918 when he became a melter.

John J. Watson, of the Weirton Steel Co., Weirton, W. Va., has retired after a period of service which began with the formation of the original company, the Phillips Sheet & Tin Plate Co., at Clarksburg, W. Va., in 1905. He was at one time general manager of sales and head of the sheet and tin plate sales department.

James Reed has been elected president and chief executive officer of Cramp Shipbuilding Co., recently formed to succeed the William Cramp & Sons' Ship & Engine Building Co., and to reopen the yard in Philadelphia for constructing naval vessels. Other officers are: Vice president, H. Birchard Taylor; vice president and general manager, R. D. Weyerbacher, commander U.S.N., retired.

J. B. Neiman, Detroit plant manager, Federated Metals division, American Smelting & Refining Co., has been appointed general manager of the division's aluminum operations throughout the country, effective Jan. 1, 1941. Mr. Neiman announces that effective the same time, the Detroit plant will be operated under the supervision and as a division of the Federated Metals Whiting, Ind., plant. Local management and organization will be continued.

R. C. Garlick has been named general manager of sales, Sharon Steel Corp., Sharon, Pa. He formerly was manager of sales at Chicago. Mr. Garlick joined the Chicago sales staff of Sharon Steel in 1909, following which he served as district sales manager at Sharon, Pa., and Cleveland.

G. F. Griffiths succeeds Mr. Garlick as district sales manager at Chicago. Prior to joining the corporation in 1938, he was employed by United States Steel Products Co. T. F. Flynn, associated with the Sharon organization as a salesman in its Chicago office since 1912, becomes assistant district sales manager at Chicago.

Rolling Mill Completed

■ Continental Steel Corp., Kokomo, Ind., last week reported its new 3-high sheet rolling mill had been completed and was in operation. Constructed by the Lewis Foundry &

Machine division of Blaw-Knox Co., Pittsburgh, the new unit is of the "jump mill" type. With only one of its rolls power driven, it is a water-controlled semibreakdown unit. It is equipped with a motor screwdown and automatic roller and catcher tables.

August Machine Tool Output Near 1940 Peak

Machine tool builders' operations in August averaged 93.3 per cent of capacity compared with 88.3 per cent in July and the 1940 peak—93.4—in April, according to Machine Tool Builders association, Cleveland. August, 1939, operations were at 72.6 per cent of capacity.

Capacity of the industry, measured in payroll hours, has increased steadily and at the end of August stood at 135 per cent, based on capacity in September, 1939, as 100.

Officers Elected by Gray Iron Founders

C. J. Miller, president, Fremont Foundry Co., Fremont, O., was elected president of the Gray Iron Founders' Society Inc. at its annual meeting in Cleveland, Sept. 12. Other officers elected: Vice president, Ronald E. Kucher, vice president, Olympic Foundry Co., Seattle; secretary, John H. Pohlman, president, Pohlman Foundry Co. Inc., Buffalo; treasurer, Stanley C. Melford, treasurer, Auburn Foundry Inc., Auburn, Ind. W. W. Rose was re-elected executive vice president.

The following were elected directors for three years:

Illinois area: C. B. Magrath, president, Greenlee Foundry Co. and Northwestern Foundry Co., Chicago.

Indiana-Michigan area: A. J. Rumely, president, LaPorte Foundry Co., LaPorte, Ind.

Minnesota-Wisconsin area: B. D. Claffey, manager, General Malleable Corp., gray iron division, Waukesha, Wis.

New York area: J. H. Pohlman, president, Pohlman Foundry Co. Inc., Buffalo.

Northern Ohio area: A. C. Denison, president, Fulton Foundry & Machine Co., Cleveland.

Pennsylvania area: A. H. Torrence, treasurer, Indiana Foundry Co., Indiana, Pa.

Directors to serve for one year:

New England area, exclusive of Connecticut: T. I. Curtin, president, Waltham Foundry Co., Waltham, Mass.

Northern Ohio area: W. L. Seelbach, secretary-treasurer, Forest City Foundries Co., Cleveland.

Pacific coast area: R. E. Kucher, vice president, Olympic Foundry Co., Seattle.

Connecticut area: H. S. Wash-

burn, president, Plainville Casting Co., Plainville, Conn.

Southern Ohio area: R. J. Redmond, secretary-treasurer, Buckeye Foundry Co., Cincinnati.

Southern states area: A. E. Hartwell, president, Hartwell Iron Works, Houston, Tex.

The main points discussed at the meeting were the co-operation of foundries for national defense, and interpretation of standard terms of sale.

Cash Farm Income Up 4.2 Per Cent Over 1939

Cash farm income in 1940 will be about \$8,900,000,000, according to a department of agriculture forecast. This represents an increase of \$360,000,000, or 4.2 per cent, over 1939, and would be within 3 per cent of 1937 cash income, peak year of the past decade.

Cash farm income of \$4,527,000,000 in the first seven months this year was \$354,000,000 over the figure for the corresponding period last year. August income also is believed to have been higher than in August, 1939. Income during the remainder of the year is not expected to differ greatly from the same period last year. A marked rise in prices followed the outbreak of the war a year ago and brought a corresponding increase in farm income.

Offers Prizes for Best Steel Bridge Designs

American Institute of Steel Construction, 101 Park avenue, New York, announces its annual bridge design contest, open to registered students of structural engineering and architecture in recognized technical schools in the United States and possessions. Cash prizes of \$200, \$100 and \$50 will be awarded with certificates for honorable mentions.

Subject of the competition will be a steel overpass bridge to carry a single railroad track over a highway. Structure should provide a clear distance of 16 feet between parapets and a clearance over the road of 14 feet 6 inches for full length of span.

Drawings must be received at the institute's office by Feb. 10, 1941.

Trade Name Rights Clarified by Courts

A trade mark name remains the legal property of its owner until the trade mark license expires, even though the name is adopted by the general public and applied to competitors' products. This was the ruling of a United States court of appeals in upholding the right of

Corning Glass Works, Corning, N. Y., to its name "Pyrex."

Many other trade mark names have become so popular that they are associated by the public with products similar to those to which they apply. The fact the public uses the names loosely, however, does not give competing companies the right to use them.

August River Shipments Held at July Level

Tonnage shipped by water in the Pittsburgh district in August was on a level with July. On the Ohio river 1,412,400 net tons of freight was moved, a decrease from 1,473,500 tons moved in July. Total, however, is still greater than in August, 1939.

On the Monongahela 2,679,200 tons was moved in August, against 2,680,900 tons in July. Both totals are considerably above last year. Allegheny tonnage showed a considerable increase, moving to 500,800 tons in August, from 398,900 in July.

Steel shipments on the Ohio decreased during the month to 147,700 tons against 164,100 tons in July. This was principally due to a decline in shipments of oil country tubular goods.

Steel shipments on the Monongahela declined from 129,200 tons in July to 91,800 in August. This decrease was also largely due to decline in oil country tubular goods shipments.

Atlantic and Gulf Ports Export Traffic Increases

Export traffic through Atlantic and Gulf ports in August was approximately 88 per cent greater than the volume in August, 1939, according to the Association of American Railroads' manager of port traffic.

Cars of export freight, other than grain, unloaded at Atlantic and Gulf ports last month totaled 51,334, compared with 27,278 in August last year. Cars of grain for export unloaded at these ports in August were 1472, compared with 1601 in August, 1939. The total exceeds July traffic of 46,554 cars by 10 per cent.

Volume of export freight, other than grain, handled through ports from Hampton Roads north in August closely approximates World war traffic. Comparison of August this year with August in 1918 and 1919 from New York and other north Atlantic ports, in cars follows:

		Total	
	New	Other	Hampton
Year	York	North	Rds. and
		Atlantic	North
1940	21,046	15,129	36,175
1919	24,747	13,328	38,075
1918	22,692	13,627	36,319

1,259,200 Skilled Workers by July 1, Federal Training Plan

■ SCOPE of the federal government's labor-training program after Sept. 30 has not been definitely determined. While there is evidence indicating the program will be continued, in some form, its extent will depend upon the amount appropriated by congress for labor-training the remainder of this fiscal year.

The President has asked for an additional \$53,000,000 to supplement \$15,000,000 appropriated early in the summer and already largely expended. Forty-four million would be used for continuing the present program, the other \$9,000,000 for short courses in engineering colleges.

Outlines Proposed Plans

This appropriation was before the house committee on appropriations last week and was expected to be reported out soon. As the money is in a deficiency appropriation, which is to be rushed through, it appears very probable the funds will shortly be available to the bureau of education. Additional grants may be made later.

John W. Studebaker, United States commissioner of education and the program's national director, had requested a minimum of \$48,600,000 to supplement the initial grant and to carry the program through to July 1, 1941. That 750,000 trainees could be given courses varying from 100 to 500 clock hours was, he said, an "exceedingly conservative estimate."

Cost of a more ambitious program proposed by Mr. Studebaker, covering the trade schools, necessary equipment, and special courses for engineering schools, national youth administration employes and the CCC would be \$142,720,000. Under this plan 1,259,200 would receive special instruction for national defense. A \$20,000,000 fund would be established for purchase of equipment.

Latest compilation shows 107,757 enrolled in training courses as of Aug. 31. Records, subject to change almost daily, indicate approximately 35,000 are WPA employes.

Although industry has understood that the burden of training skilled men must rest primarily upon itself, results of the federal training program to date have generally met with its approval. Program has aided considerably by eliminating at the outset men unlikely to develop into skilled or semiskilled workers. It has also aided by teaching basic fundamentals, enabling employers to put trainees to work on simpler jobs, releasing for more intricate

work men with greater experience. One-time machinists and mechanics, who have not worked at their trade in years are given an opportunity to recover some of their skill.

Consensus among industrialists is that the program should be continued on a broader plane. In his request for appropriations, Mr. Studebaker outlined his plans for the program's prolongation. Fundamentals of the present set-up would be carried over as a foundation.

The program would continue to be administered by the national commissioner of education through state boards for vocational education. Entire operating costs, including personnel salaries, supplies, power, heat and other expenses would be borne directly by the federal government. Federal funds, however, would not be permitted for construction of buildings, equipment of shops, or any costs connected with Smith-Hughes or George-Deen programs.

Responsible for correct conduct of the program in its own area, each state's board for vocational education must continue a plan which meets the national defense training program's needs. Industry and labor must be consulted concerning need for training, jobs for which training is needed, numbers to be schooled, courses to be offered, selection and qualification of teachers, shops and equipment required, character and extent of instruction given, required qualifications of prospective trainees, elimination and transfer of trainees who do not develop properly.

"Essential" Industries Listed

With advice and counsel of the war and navy departments, the national commissioner of education would continue to determine industries essential to national defense for which training may be given. The following industries are currently considered essential: Aircraft manufacturing, maintenance and repair; machine tools; shipbuilding, maintenance and repair; automotive manufacturing, maintenance and repair; electrical; forging; boiler and heavy steel plate; foundry; light manufacturing; sheet metal; wood-working; chemicals; ammunition and light and heavy ordnance.

State and local boards for vocational education would again have responsibility of determining, with advice and counsel of employers, labor representatives, public employment agencies and others: Jobs in essential industries for which training shall be given; number to be

trained for each job; content of training courses to be given and selection of individual students.

Further enrollees, as during the summer, would have to be of employable age and would be grouped in two classifications: Those employed in jobs essential to national defense or closely related to it, eligible for supplementary courses to increase their skill and knowledge; registrants selected from the lists of public employment agencies and who could give reasonable assurance as to their ability and determination to learn, eligible to enroll in pre-employment courses.

WPA Employes Will Be Eligible

Men employed by the works progress administration, likewise eligible for training, could again be transferred to the training schools and would be paid their regular WPA wage. Basis of selection would continue to be much the same as that for other trainees. In some instances, during the summer training period, WPA funds were used for purchase or rent of equipment needed for training purposes. It appears probable this feature will be retained, especially as the regular school enrollment will diminish greatly the available shop facilities and equipment. Further efforts will be made to return as many WPA employes to private industry as possible through training given them in the pre-employment refresher courses.

Although there was no certainty the program will be continued through the winter, L. S. Hawkins, United States office of education trade and industrial education service chief, recently assured state directors and supervisors of trade and industrial education all sound plans for prolongation of the training program would be adequately financed. He was optimistic the courses would be continued as long as apparent need for them exists in connection with adequate national defense plans. Funds, he said, are at hand which will warrant continuation of the program into the fall season.

Mr. Hawkins recommended the courses be continuous. Experience to date, he pointed out, indicates it is best to take in new enrollees as rapidly as trainees are considered ready for placement.

He further emphasized need for development of supplementary courses for persons already employed. The most serious shortages, he declared, will be in the upper brackets of skill. Obviously it is impossible, in the brief training period, to take an entirely untrained man and make of him a skilled worker. Consequently supplementary courses must be offered to prepare those already employed in

Federal Labor Training Proposals Summarized

Proposals:	No. to be trained	Aver. No. weeks in training	Hours of training per week	Total cost
Trade training	600,000	4 to 40	4 to 40	\$48,600,000
Equipment				20,000,000
Engineering schools.....	58,000	12	40	14,000,000
NYA:				
Present program.....	213,600	40	15	21,360,000
Requested expansion..	237,600	40	15	23,760,000
CCC	150,000	40	15	15,000,000
Totals	1,259,200	..	..	\$142,720,000

single skilled or semiskilled occupations to develop into skilled workers. The latter then, according to Mr. Hawkins, would be capable of breaking in other single skilled or semiskilled workers.

Active steps will undoubtedly be taken, said Mr. Hawkins, to promote additional development of training in industry. It will become increasingly necessary for state and local directors, supervisors and teacher trainers to co-operate with industry in training of instructors or the development of instructing skill in foremen. He was confident men experienced in foreman training, particularly for instruction or breaking-in of inexperienced workers, would be available when needed.

In a supplementary proposal to expand the program of training for national defense through schools and colleges, Mr. Studebaker summarized training resources available. There are now, he said, 1053 public trade schools whose courses have been approved for federal financial aid under existing vocational education acts. These schools engage more than 5000 full time instructors, skilled craftsmen trained to teach. State and local departments of education have nearly 1000 trained and experienced trade and industrial education supervisors, who plan, develop and administer modern programs of trade and industrial education.

Could Accommodate 600,000

Without interference with the regular program of day trade-preparatory classes and of evening trade-extension classes, according to Mr. Studebaker, program devices were developed that would permit intensive use of these school facilities to accommodate an estimated minimum of 750,000 trainees in courses varying from 100 to 500 clock hours. This estimate, he said, is confined to utilization of existing facilities used last year for trade-training courses. In addition, however, there are several thousand shops in general high schools which could be adapted for such use.

The requested \$48,600,000, said Mr. Studebaker, would be sufficient to continue operating these schools the remainder of this fiscal year.

Training offered would apply to the essential industries previously listed. Approximately 600,000 trainees would be accommodated.

More than 1300 local community advisory committees, consisting of labor and industry representatives, are working with education authorities in making local surveys of labor supply in relation to industry's needs. The committees aid in determining the most satisfactory policies for operating a vocational training program in each community.

Mr. Studebaker also pointed out the important role engineering colleges could play in facilitating national defense. Extensive courses from one to eight months could be made available to men with the equivalent of at least three years of standard engineering training but who lacked specialized knowledge of the field in which a shortage exists. Such courses, supplementing the regular training, would quickly develop trained specialists.

Average training period would be about three months. An appropriation of \$14,000,000 would make possible intensive and refresher courses for nearly 60,000 in engineering fields of special value to national defense.

The present national youth administration program provides opportunities for training 213,600. Mr. Studebaker proposes they be given training and work that would be of value to the nation in its rearmament efforts. Local school facilities could be adapted to meet the program's requirements. Further NYA appropriations could be utilized to expand NYA training for out-of-school youth. For \$23,760,000, said Mr. Studebaker, 237,600 could be given 600 hours' training.

Since many CCC camps have been located near school shops, Mr. Studebaker suggests, it is very feasible the enrollees at such camps be given training also. Records indicate, he said, that 350 schools have already been giving training in vocational and industrial fields to 8000 CCC enrollees from 400 nearby camps.

With funds provided to enable the camps to defray part of the school operating costs many more schools would be disposed to make their facilities available for such

purposes. A preliminary estimate shows nearly 1050 camps, or about 70 per cent of the total, could transport their enrollees to school shops for training. More than half the enrollees, or about 150,000, would avail themselves of the opportunity to acquire vocational training.

Appropriation of \$15,000,000 would enable 150,000 CCC enrollees to receive 600 clock hours of training over a 40-week period. The proposed program would call for 15 hours training weekly, in addition to 32 hours spent at the regular CCC work.

Aeronautic Exports Drop 21 Per Cent in July

July aeronautic exports amounted to \$22,813,601, or 21 per cent less than the June total, but still 152 per cent above July, 1939, according to department of commerce. Ten countries took 98 per cent of the total, as follows:

United Kingdom	\$14,338,191
Canada	4,908,461
China	1,350,477
Portugal	403,416
Australia	371,801
Netherlands Indies	277,200
Brazil	274,771
Venezuela	158,391
Finland	115,440
Mexico	101,845
Total listed	\$22,857,073

Aeronautic exports for first seven months totaled \$161,200,691, or 37 per cent greater than for the full year 1939. France and the British Empire took 78.5 per cent of the exports:

France	\$75,402,397
United Kingdom	82,500,159
Canada	11,905,264
Australia	9,910,701
China	5,063,068
Sweden	4,929,839
Finland	4,170,677
Netherlands Indies	2,856,035
Turkey	1,892,694
Norway	1,441,771
Brazil	1,282,978
Belgium	1,150,088
Total listed	\$152,561,955

Civil Aircraft Output Up 41 Per Cent in First Half

Production of domestic civil airplanes in the first six months this year totaled 2280, 41 per cent more than in the same period last year, and 169 per cent above the period in 1938, according to the department of commerce.

Greatest gain was in the 51 to 70 horsepower class, 1496 craft of this size being built compared with 466 in the first half last year and 7 in the period in 1938. Craft under 50 horsepower declined from 277 for first six months of 1939 to 256 in 1940. In the 71 to 100 horsepower class, production increased from 36 craft in first six months 1939 to 290 in 1940.

Roosevelt and Labor

■ WHEN President Roosevelt delivered his labor speech before the teamsters' convention in Washington on Sept. 11 he was talking before a professional labor group. That is, he was talking largely to men whose income is derived from dues paid in by union members. When he told them that a breakdown of existing labor and social legislation would weaken rather than increase our efforts for defense, when he reminded them that membership in the teamsters' union has increased from 70,000 in 1933 to 500,000 in 1940, they cheered. As General Hugh Johnson is wont to remark, nobody shoots Santa Claus.

. . .

Of course, the President's address was specious. What the President really told these men was that there is to be no change in laws that, in substance and through their administration, give to union organizers a franchise to coerce workers into unions, without any reference as to how they as individuals may feel about the matter. He assured them of their vested right to a portion of the contents of the pay envelop of every worker they might enroll, and that they could continue to count on vast help under the national labor relations act and the national labor relations board. No wonder the union officers and delegates cheered.

. . .

The President also whitewashed organized labor of charges of racketeering and dishonesty. "At times," he said, "internal obstacles to the growth of labor unions have come in those rare instances where the occasional scoundrel has appeared in position of leadership," explaining that this happens also to all organizations, to all trades or professions alike. Labor unions

are not the only organizations, he said, which have to suffer innocently for the crimes and misdeeds of one or two of their selfish and guilty members. Naturally, such blanket absolution must be very pleasing to professional labor leaders in general. No wonder they cheered.

The President's reference to "free and independent" unions also was misleading. The terms "free and independent" quite accurately described the position of professional labor leaders under our federal laws and policies. On the other hand, it is a well-known fact that rank and file dues-paying members usually are not free and independent. Many a union member has learned to his sorrow that it is extremely hazardous to life and limb to get up in meeting and find fault with union leaders and their acts.

. . .

Organized labor has done a lot for labor in many fields of industry. It also has set up many abuses that have worked to the serious disadvantage of workers and of industries with which they have been connected. If properly curbed, organized labor has a useful place in our industrial economy. As it stands under the laws and policies of the Roosevelt administration, it constitutes in large measure a stench and a disgrace.

There are many reasons why President Roosevelt should not be elected to a third term. His un-American position with reference to professional labor unionism is one of them.

EC Kreutzberg

The BUSINESS TREND

Business Index Rebounds From Holiday Low

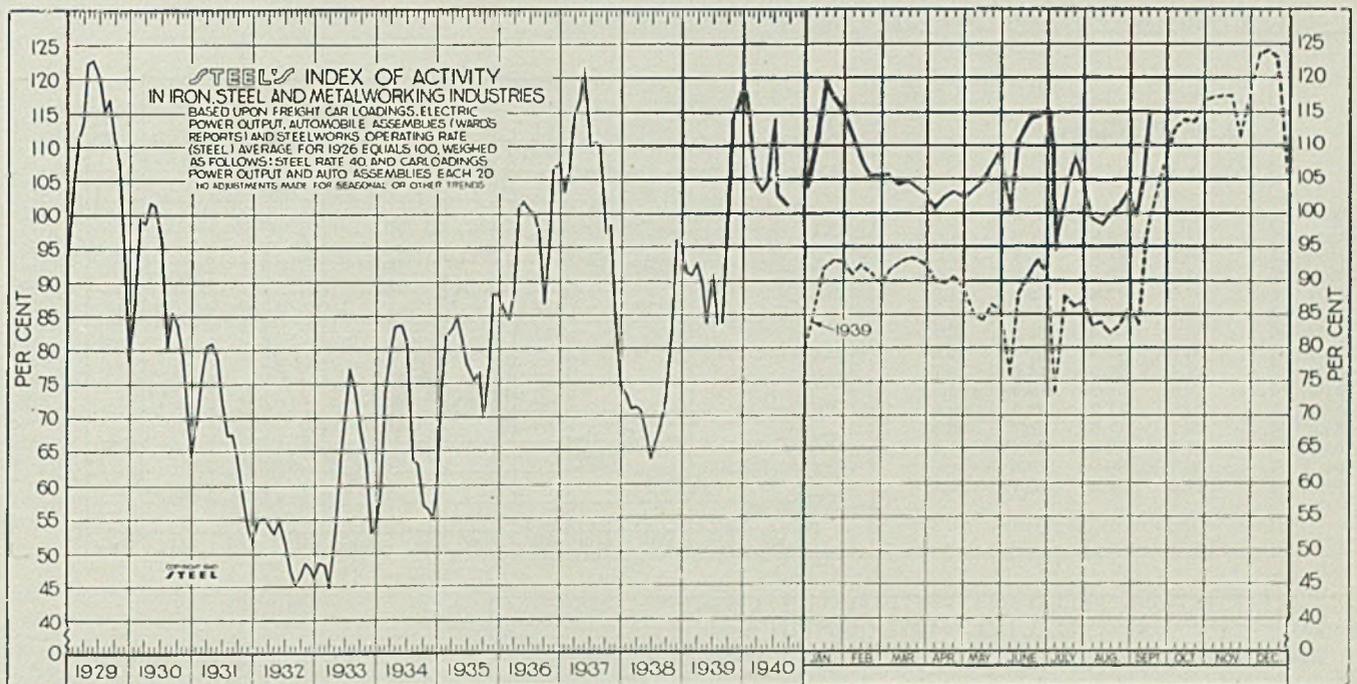


■ THE sharp rebound recorded by most industrial indicators from the Labor day week interruption is particularly encouraging. During the week ended Sept. 14, steelmaking operations, electric power consumption and revenue freight carloadings touched new high levels for this year. Automobile assemblies continued the steady upward trend which got under way during the week ended Aug. 17.

Prospects are particularly bright for increased operations in such industries as aircraft, machine tool, heavy electrical equipment, construction and ship-

building, reflecting increased demand from the domestic rearmament program.

For the latest period ended Sept. 14, STEEL'S index of activity gained 16.2 points to 114.9 from 98.7 recorded during the holiday week ended Sept. 7. In the comparable period of 1939, 1938 and 1937 STEEL'S index of activity gained 13.8, 14.5 and 0.7 points respectively. Each of the industrial indicators composing the index recorded substantial gains during the latest period and prospects are for continued improvement during the immediate future.



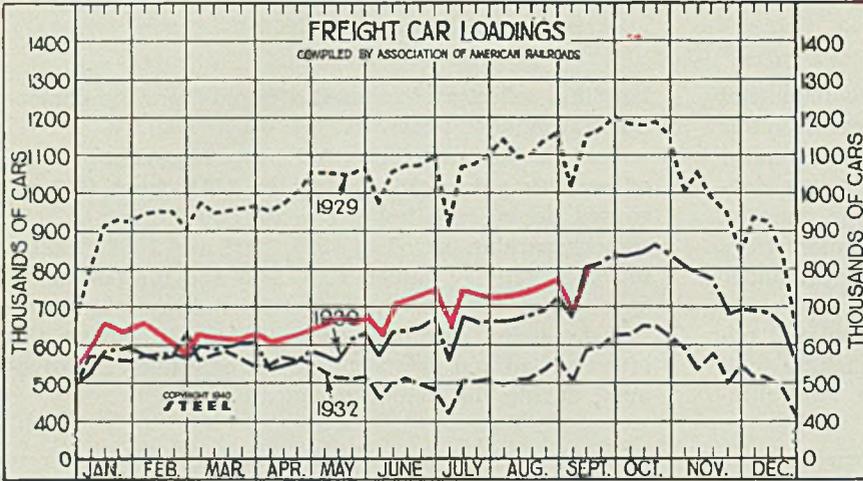
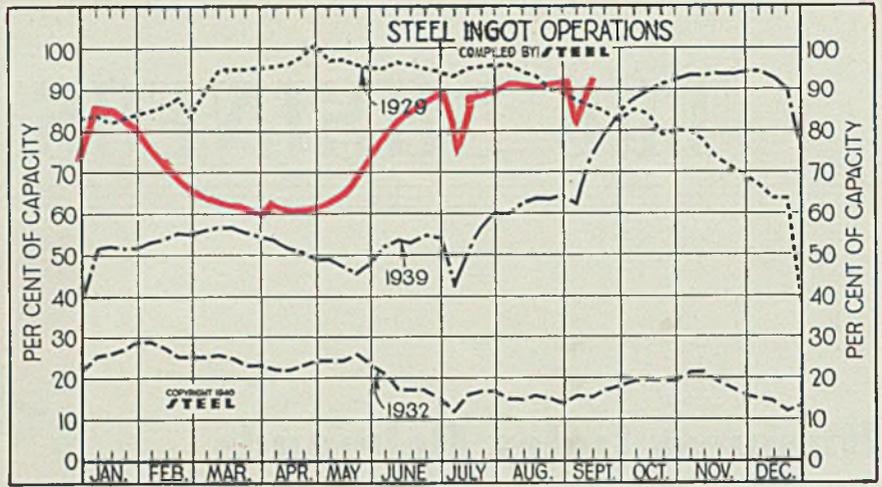
STEEL'S index of activity gained 16.2 points to 114.9 in the week ended Sept. 14:

Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
July 6	94.2	73.4	Jan	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
July 13	108.5	87.8	Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
July 20	106.0	86.0	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
July 27	103.4	86.8	April	105.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
Aug. 3	90.7	83.5	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
Aug. 10	98.5	83.9	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
Aug. 17	100.8	82.2	July	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug. 24	101.4	83.4	Aug.	101.0	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Aug. 31	103.5	86.3	Sept.	...	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Sept. 7	98.7	80.7	Oct.	...	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Sept. 14	114.9	97.5	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
June 15	86.0	52.5	27.0	75.5
June 22	88.0	54.5	28.0	74.0
June 29	89.0	54.0	28.0	77.5
July 6	75.0	42.0	24.0	74.0
July 13	88.0	50.5	32.0	82.0
July 20	88.0	56.5	36.0	81.0
July 27	89.5	60.0	37.0	84.0
Aug. 3	90.5	60.0	40.0	84.5
Aug. 10	90.5	62.0	40.0	84.0
Aug. 17	90.0	63.5	41.5	81.0
Aug. 24	90.5	63.5	43.5	83.0
Aug. 31	91.5	64.0	44.5	83.0
Sept. 7	82.0	62.0	41.5	72.0
Sept. 14	93.0	74.0	46.0	80.0



Freight Car Loadings

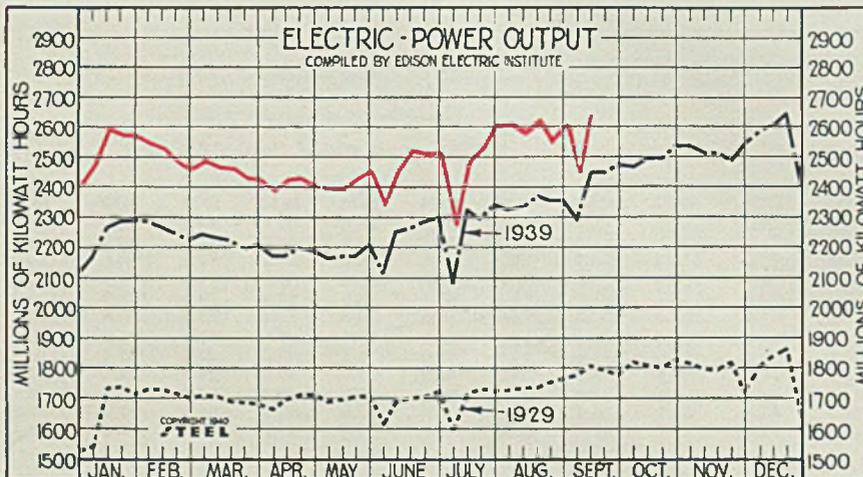
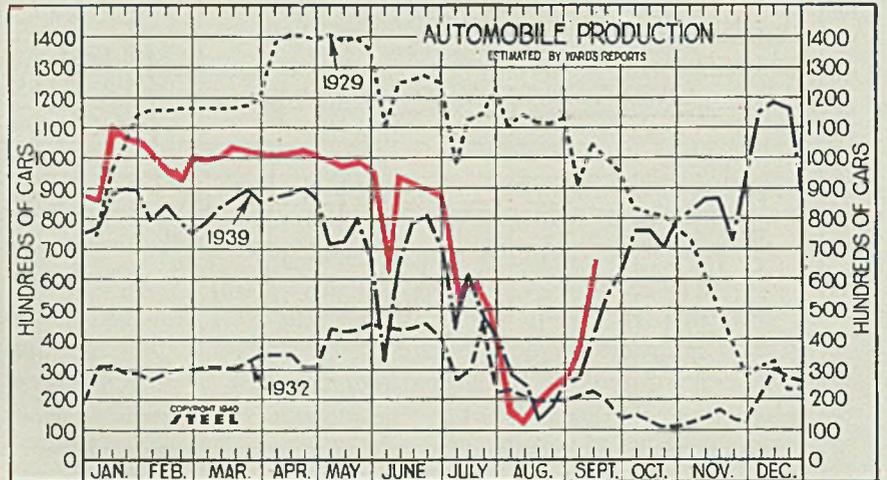
(1000 Cars)

Week ended	1940	1939	1938	1937
June 8	703	635	554	754
June 15	712	638	556	756
June 22	728	643	559	774
June 29	752	666	589	808
July 6	637	559	501	682
July 13	740	674	602	770
July 20	730	656	581	771
July 27	718	660	589	783
Aug. 3	718	661	584	770
Aug. 10	727	665	590	777
Aug. 17	743	674	598	781
Aug. 24	761	688	621	787
Aug. 31	769	722	648	805
Sept. 7	695	667	569	711
Sept. 14	804	806	660	827

Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
June 15	93.6	78.3	41.8	111.6
June 22	90.1	81.1	40.9	121.0
June 29	87.6	70.7	40.9	122.9
July 6	52.0	42.8	25.4	101.0
July 13	62.2	61.6	42.0	115.4
July 20	53.0	47.4	32.1	88.1
July 27	34.8	40.6	30.4	86.4
Aug. 3	17.4	28.3	14.8	78.7
Aug. 10	12.6	24.9	13.8	103.3
Aug. 17	20.5	13.0	23.9	93.3
Aug. 24	23.7	17.5	18.7	83.3
Aug. 31	27.6	25.2	22.2	64.2
Sept. 7	39.7	26.9	17.5	59.0
Sept. 14	66.6	41.2	16.1	30.1



Electric Power Output

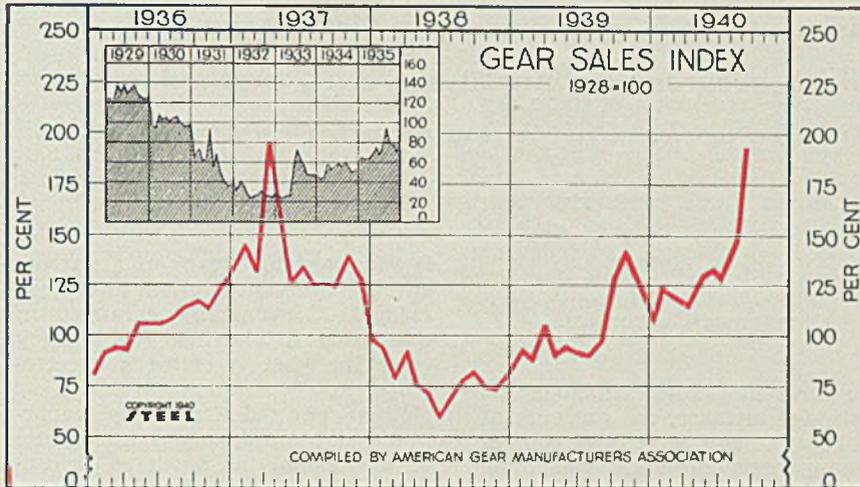
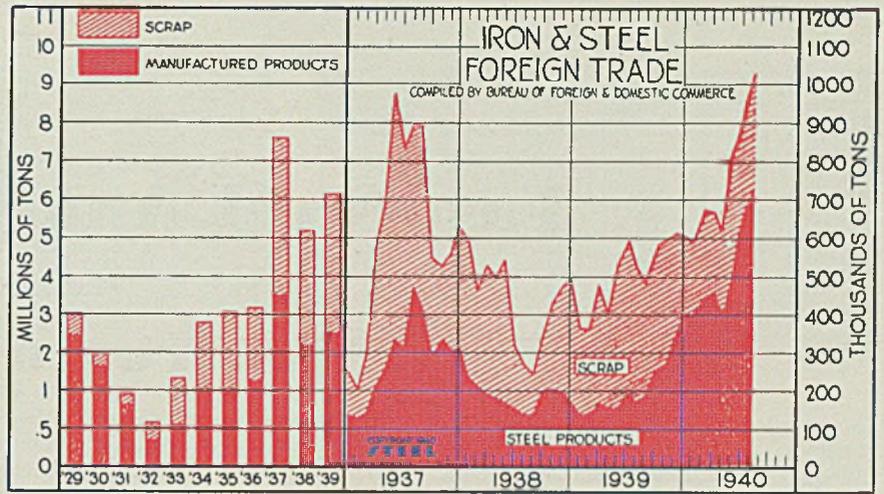
(Million KWH)

Week ended	1940	1939	1938	1937
June 15	2,516	2,265	1,991	2,214
June 22	2,509	2,285	2,019	2,238
June 29	2,514	2,300	2,015	2,238
July 6	2,265	2,088	1,881	2,096
July 13	2,483	2,324	2,084	2,298
July 20	2,524	2,295	2,085	2,259
July 27	2,601	2,342	2,094	2,256
Aug. 3	2,605	2,325	2,116	2,262
Aug. 10	2,589	2,333	2,134	2,301
Aug. 17	2,606	2,368	2,139	2,304
Aug. 24	2,571	2,354	2,134	2,295
Aug. 31	2,601	2,357	2,149	2,321
Sept. 7	2,463	2,290	2,048	2,154
Sept. 14	2,639	2,444	2,215	2,281

Iron and Steel Exports

(Thousands of Gross Tons)

	Steel Products		Scrap		Total
	1940	1939	1940	1939	
Jan...	396.1	134.8	187.5	227.9	583.5
Feb...	436.6	134.8	234.7	224.9	671.3
Mar...	457.1	162.1	206.9	312.3	664.0
Apr...	391.8	153.9	221.2	240.1	612.9
May...	471.5	147.8	312.5	384.9	784.0
June...	617.7	190.0	318.4	398.9	936.0
July...	707.8	163.6	327.1	350.1	1034.9
Aug...	.....	185.2	.....	291.9	.....
Sept...	.....	244.9	.....	330.7	.....
Oct...	.....	255.1	.....	336.8	.....
Nov...	.....	332.9	.....	272.7	.....
Dec...	.....	394.0	.....	206.4	.....
Total...	2,499.0	.....	3,577.4	.....	.....



Gear Sales Index

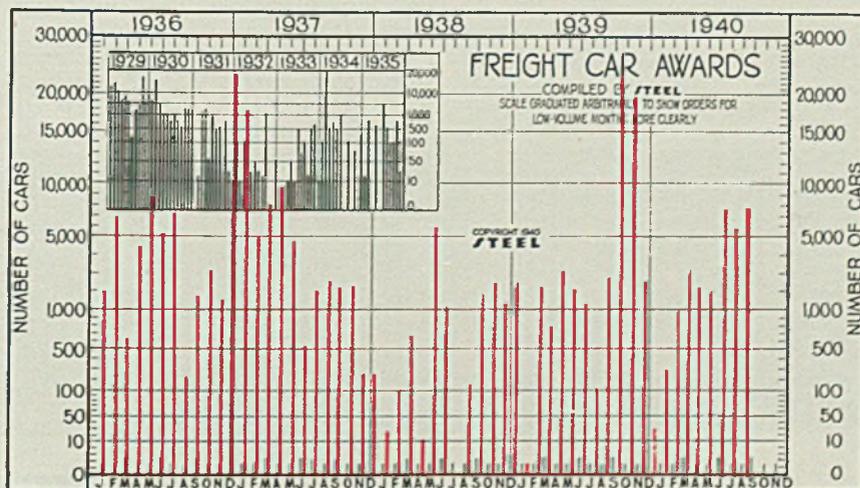
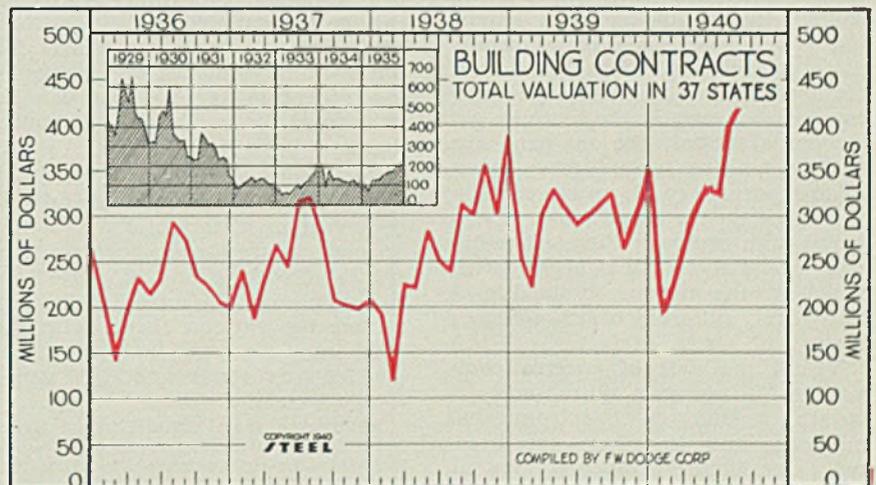
(1928 = 100)

	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
Apr.	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.	.....	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

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
Apr...	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...	.....	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



Freight Car Awards

(Hundreds of Cars)

	1940	1939	1938	1937
Jan.....	3.60	.03	.25	178.06
Feb.....	11.47	22.59	1.09	49.72
Mar.....	31.04	8.00	6.80	81.55
Apr.....	20.77	30.95	.15	97.72
May.....	20.10	20.51	60.14	47.32
June.....	74.75	13.24	11.78	5.48
July.....	57.36	1.10	.00	10.30
Aug.....	75.25	28.14	1.82	14.75
Sept.....	.....	230.00	17.50	12.16
Oct.....	.....	198.34	25.37	13.55
Nov.....	.....	26.50	12.32	2.75
Dec.....	.....	.35	25.81	2.75
Total.....	.....	577.75	163.03	516.11

Fast Steel Analysis

By Spectroscope

Visual spectra comparison methods offer extremely fast means of qualitative analysis. With accuracy within 20 per cent, method also suitable for quantitative work. Only a few minutes required

■ WHILE the spectrographic method of analyzing metals is comparatively fast, especially when set alongside the complicated and extensive work that a chemical analysis necessitates, spectroscopic methods are even faster.

To look through the eyepiece of a spectroscope and compare the spectrum as seen with that drawn out or photographed on a chart is, of course, much quicker than exposing and developing a photographic plate and taking microphotometric readings of line intensities for later comparison, even if the plate be developed after only the one exposure without waiting for a further dozen or so exposures to fill up the remaining space on the same plate. Compared with ordinary chemical methods of analysis, the speed with which results may be obtained is of an entirely different order—minutes instead of hours, in fact.

Visual methods of spectra comparison do not give quite such accurate results as spectrographic methods, and therefore are used more for identification and general classification purposes than for extremely accurate routine analyses. However, when the method is regularly operated by a trained youth or laboratory assistant, the speed

By A. FISHER
Metallurgist
Magnesium Elektron Ltd.

is quite remarkable. In steel analysis, for instance, the presence of and approximate percentage content of manganese, chromium, vanadium, molybdenum, cobalt, titanium, copper, tungsten and other elements can be determined in a few minutes. When comparison charts for the various elements are available, the operation is one that can be performed by any intelligent young man.

Spectroscopic analysis of steels is exactly the same in principle as that of any other material. By means of an electric arc struck between electrodes consisting one of pure iron, the other of the steel to be analyzed, the various elements in the steel are vaporized and the light emitted from the incandescent vapor

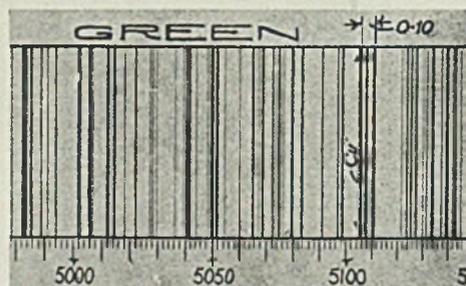
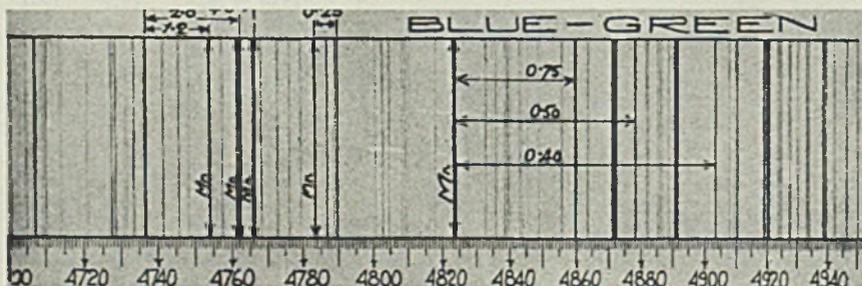
Abstracted from "Wild-Barfield Heat-Treatment Journal," published by Wild-Barfield Electric Furnaces Ltd., Elecfurn Works, Watford By-Pass, Watford, Herts, England.

Fig. 1. (Left)—Comparison map for manganese. Fig. 2. (Right)—Comparison map for copper

is examined by means of a narrow slit, a collimator, a prism and a telescope. Conveniently arranged in that order in one instrument, they comprise what is called a spectroscope.

Light emitted from any vaporized metal is uniquely characteristic of that metal inasmuch as it consists of ether vibrations of certain definite frequencies. From large numbers of careful measurements made by many investigators, reference tables of corresponding wavelengths and line intensities for each metal have been compiled. The other variations are originated by the intense heat generated in the arc causing some of the electrons in the atomic system of the vaporized metal to jump out to abnormal orbits. On returning to lower orbits, light energy is given out in the particular wave length involved in the relations between the various orbits concerned. Thus since each metal has its characteristic numbers of electrons and orbit relations, the light emitted can be analyzed by means of the slit, prism, etc., to produce a line spectrum which will enable positive identification of any metal.

Figs. 1 to 7 show the appearance of various spectra. As will be noted,



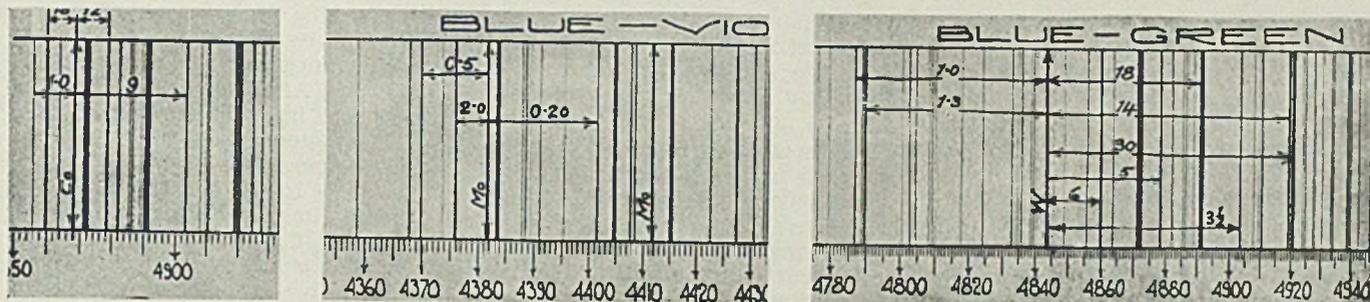


Fig. 3. (Left) — Comparison map for cobalt. This can only be used if molybdenum is less than 0.25 per cent. Fig. 4. (Center) — Comparison map for molybdenum. Fig. 5. (Right) — Comparison map for tungsten

the spectrum of a metal appears as a dark horizontal band crossed by a number of brilliantly colored lines of different intensities. The colors extend from violet through blue, green and citron to red. On an instrument of low deviation and dispersion—one with a single prism, for example—the whole of the spectrum from violet to red can be seen simultaneously. On an instrument of high deviation and dispersion, say one of five prisms, the whole field of view at one instant may consist of lines of apparently only one color. On such an instrument, line separation and analysis are facilitated.

As each pure metal has its own characteristic spectrum consisting of a particular series of differently colored lines of certain relative intensities at certain relative distances from each other, it will not be difficult to see that the presence of the vapor of a strange metal in the arc—the metal being introduced either as an alloying element in the

electrode or externally by insertion into the arc—will cause another different series of lines to appear superimposed on the spectrum of basis or reference electrode metal.

For instance, if two pure iron electrodes are used, the pure iron spectrum will be reproduced. If one electrode is replaced with a piece of ordinary mild steel, the presence of the manganese in the steel will cause additional lines to appear in the iron spectrum at certain unchangeable positions which are known. The intensity of these manganese lines in relation to the intensity of the neighboring iron lines will have a certain value according to the manganese content in the steel.

By comparing the relative intensity of the manganese and iron lines as seen in the spectroscopy against those laid down on a comparison chart for the same metals, an estimate can be made of the manganese content in the mild steel.

The comparison chart for manganese in steel is constructed by plotting from the spectra of steels of known manganese content certain spectrum charts showing the relative intensities of the iron and manganese lines for the various manganese contents. Similarly, comparison charts are made for other elements.

The accuracy of spectroscopic determination of most elements is about 20 per cent of the actual content. This means it is possible to distinguish the difference between a manganese content of 0.4 per cent and 0.5 per cent or between 0.2 and 0.25 per cent. It is thus evident there will not be the slightest difficulty in separating a nondistorting high-carbon tool steel of 1.3 per cent manganese content from a straight high-carbon standard tool steel of 0.40 per cent manganese, should these have become accidentally mixed in the tool room steel stores. And the test can be carried out in less than a minute.

Again the sensitiveness of the method permits the presence of certain elements to be definitely known, even though they appear in extremely small amounts. For example, should chromium and vanadium tool steels become mixed, they can be

IRON SPECTRUM LINES IN ARC FROM 4181 TO 5663											
Å = Wavelength in Angstroms											
I = Visual intensity at 4 amperes											
Å	I	Å	I	Å	I	Å	I	Å	I	Å	I
4181.76	5	4309.04	3	4488.13	2	4680.30	1	4886.34	11	5029.62	1
4182.39	3	4309.38	6	4489.74	2	4682.11	1	4887.2	1	5036.5	1
4184.90	3	4315.09	6	4490.09	1	4683.57	1	4888.65	1	5039.27	1
4187.05	6	4325.77	10	4490.77	1	4688.21	1	4889.1	1	5041.08	4
4187.81	6	4326.76	1	4494.57	6	4690.15	1	4890.77	8	5041.76	4
4191.45	5	4327.10	1	4514.19	1	4691.42	3	4891.51	10	5044.2	11
4195.34	2	4337.05	5	4517.53	1	4700.20	1	4903.33	4	5048.45	1
4196.22	1	4343.28	1	4520.24	1	4701.05	1	4907.75	1	5049.83	5
4198.31	6	4343.70	1	4522.64	1	4704.96	1	4909.40	1	5051.64	5
4198.65	1	4346.56	1	4525.15	3	4707.29	1	4910.03	1	5054.3	5
4199.10	6	4348.95	1	4526.57	1	4707.48	1	4910.33	1	5060.1	1
4200.92	1	4351.55	1	4528.24	2	4709.09	1	4910.57	1	5065.02	1
4202.03	7	4352.74	4	4528.62	1	4710.28	2	4919.01	8	5065.20	1
4203.99	3	4358.51	1	4531.16	4	4714.18	1	4920.52	12	5067.16	1
4206.70	1	4367.58	2	4547.03	1	4721.00	1	4923.9	1	5068.78	4
4207.13	1	4367.91	1	4547.86	2	4727.41	2	4924.78	2	5072.1	1
4208.60	1	4369.78	3	4549.48	1	4728.55	2	4927.4	1	5072.7	1
4210.36	5	4373.57	1	4550.82	1	4731.49	1	4927.88	1	5074.75	3
4213.65	1	4375.93	5	4552.55	1	4733.59	2	4930.33	1	5076.3	1
4215.42	1	4383.55	15	4556.13	3	4735.84	1	4933.35	1	5079.23	3
4216.19	3	4387.90	1	4560.11	1	4736.79	6	4934.02	1	5079.74	2
4217.56	2	4388.42	1	4564.83	1	4741.53	1	4938.18	1	5083.34	4
4219.36	4	4389.25	1	4565.68	1	4745.80	1	4938.83	3	5090.79	2
4220.34	1	4390.96	2	4566.83	1	4748.3	1	4939.69	2	5096.99	2
4222.23	4	4395.29	1	4568.79	1	4757.58	1	4942.3	1	5098.59	2
4224.17	2	4401.30	3	4574.23	1	4768.33	1	4946.40	1	5098.71	4
4225.46	3	4401.45	3	4574.73	1	4772.82	1	4950.12	1	5104.4	1
4225.96	1	4404.75	12	4581.53	1	4776.08	1	4952.65	1	5107.45	1
4226.43	2	4407.72	3	4583.84	1	4779.44	1	4954.5	1	5107.65	5
4227.45	6	4408.42	3	4584.83	1	4786.81	2	4957.31	1	5109.66	1
4229.75	1	4415.13	10	4587.14	1	4788.76	1	4957.61	1	5110.41	5
4233.61	6	4422.57	3	4592.66	3	4789.00	3	4962.7	1	5121.65	1
4235.95	7	4427.31	5	4594.96	1	4800.65	1	4966.10	3	5123.73	3
4238.04	1	4430.62	3	4595.37	1	4802.89	1	4967.89	1	5125.14	3
4238.83	3	4432.58	1	4596.06	1	4804.53	1	4968.71	1	5126.6	1
4239.85	1	4433.22	2	4598.14	1	4808.16	1	4969.94	1	5127.36	3
4240.37	1	4433.81	1	4600.94	1	4809.14	1	4970.50	1	5129.8	3
4245.26	2	4435.15	1	4602.01	1	4809.94	1	4973.11	2	5131.48	1
4246.09	1	4436.93	1	4602.95	5	4817.78	1	4978.61	1	5133.68	1
4247.44	1	4438.36	1	4607.67	2	4824.16	1	4982.52	4	5137.40	2
4248.22	1	4439.89	1	4611.29	3	4832.73	1	4983.27	3	5139.27	2
4250.13	7	4440.97	1	4613.22	2	4834.51	1	4983.86	3	5139.48	9
4250.79	1	4442.35	5	4618.76	1	4835.87	1	4985.27	1	5141.75	2
4250.99	1	4443.20	4	4619.30	2	4838.52	1	4985.56	2	5142.54	1
4250.97	9	4447.73	5	4625.06	3	4839.55	1	4988.97	2	5142.93	1
4256.97	1	4450.32	1	4630.13	2	4840.33	1	4991.29	2	5145.0	1
4257.83	1	4454.39	3	4632.92	2	4843.16	1	4994.13	2	5148.06	1
4258.75	1	4459.13	5	4635.85	1	4844.02	1	5001.88	4	5148.26	2
4271.17	7	4461.66	5	4637.52	2	4845.66	1	5002.82	1	5150.85	3
4271.76	9	4464.77	1	4638.02	2	4848.90	1	5005.73	3	5151.92	2
4282.41	6	4466.56	5	4643.47	1	4855.69	1	5006.13	5	5159.07	1
4285.45	1	4469.39	3	4647.44	4	4859.76	6	5007.31	2	5162.31	5
4288.15	1	4472.71	1	4654.50	1	4863.66	1	5012.07	5	5165.43	2
4291.47	1	4476.02	5	4654.64	1	4871.33	10	5014.96	4	5166.29	2
4294.13	7	4479.61	1	4661.54	1	4872.15	6	5018.44	2	5167.90	1
4298.04	1	4480.14	1	4667.46	3	4878.23	5	5021.90	1	5168.49	4
4299.25	7	4482.18	1	4668.15	3	4881.72	1	5022.26	3	5171.60	7
4302.19	1	4482.26	1	4669.18	2	4882.17	1	5027.14	2	5181.3	1
4305.46	1	4484.24	2	4673.17	2	4885.44	1	5028.14	2	5184.3	1
4307.91	10	4485.67	1	4678.86	4						

separated immediately by means of the chromium lines which would show quite strongly in the spectrum of the chromium steel with its possibly 1 per cent chromium content as against the much fainter appearance of the same lines in the low-chromium steel with only 0.25 per cent chromium.

In a similar manner, it is easy to pick out a carbon vanadium steel from straight carbon steels although vanadium content is usually of the order of only 0.20 per cent. In the same way, manganese-molybdenum, chromium-carbon, chromium-vanadium, chromium-molybdenum, copper-carbon and carbon-tungsten steels can be determined quite simply and with a fair degree of accuracy as to the quantity of the element present. In the high speed, high chromium, nickel-chromium or nickel steels, the alloy content and the number of alloying elements may make accurate quantitative analysis difficult, although qualitative-

ly it is simple. In the nickel steels, the nickel lines—even the most sensitive—do not show with less than 1 per cent of nickel, and visual analysis is not easy below 3 per cent.

The apparatus required depends upon the available electric supply. Direct current is essential. Metal electrodes will not work on alternating current. Thus if only alternating current is available on the supply line, a motor-generator or rectifier and choke coil will be required. About 10 amperes at 110 volts is a normal requirement. A series resistance variable from 12 to 25 ohms in five steps is necessary. An ammeter and voltmeter should be placed in the circuit.

Operation of the arc is extremely simple. The resistance is adjusted so the current varies according to the diameter of the specimen, allowing one ampere for each 1/10-inch diameter or thereabouts. The open arc will take about 2/3 of the current flowing when the electrodes

are touching each other. The arc can then be struck and the electrodes immediately separated about 0.25-inch. After about 30 seconds, a bead will have formed and the arc will have steadied sufficiently so it can be examined.

It will be found beneficial to adopt standard times of arcing before examination of the spectrum. Usually 30 seconds is sufficient for most elements. For nickel, however, two minutes will be found to give more reliable results.

Sometimes trouble is caused by a wandering flame. This can be avoided by setting the electrode so the flame emerges on the side opposite that from which the observation is being taken. Thus, arranging the electrodes in a sharp V pointing away from the observer will give best results.

Slit Should Be Kept Clean

It is absolutely essential that the business end of the electrodes be uncontaminated. It is not necessary to use a condensing lens between the arc and the slit, but the slit should be protected from dust and metallic splash by a thin piece of glass of good quality, such as a standard microscope slide-cover glass. The slit should be at a distance of a few inches to a foot from the arc.

A 2-prism spectroscope is generally satisfactory if the prisms are made of dense glass of a high refractive index—1.65 to 1.70—as the collimator and telescope tubes are then approximately at right angles to each other. This permits observations to be made without glare.

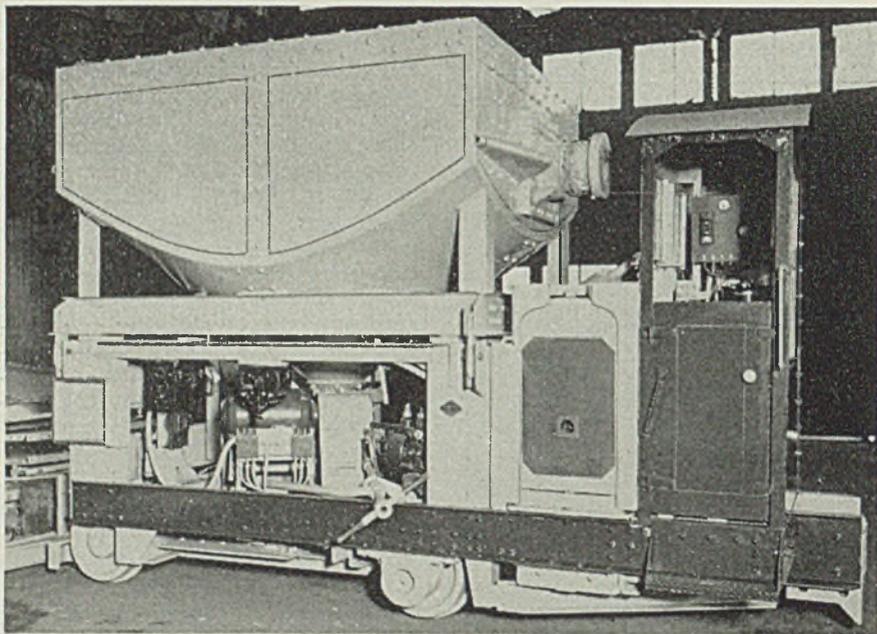
With a 5-prism instrument and observation tubes at right angles, the deviation may be of the order of 270 degrees with the light path crossing over itself. With such an arrangement, lines only 1/10 of an Angstrom unit apart can easily be separated in the blue portion of the spectrum. Observation therefore is very good.

Since there is some difficulty in obtaining reliable data on the complete iron spectrum in the visual region, the accompanying table is printed. It gives a list of all the iron lines seen in the electric arc between wavelengths of 4181 and 5662 Angstroms, together with the relative intensities of these lines.

Maps of various portions of the spectrum are shown in Figs. 1, 2, 3, 4 and 5. These illustrate the lines produced by various elements together with the neighboring iron lines. Fig. 1 is a comparison map for manganese and Fig. 2 is a comparison map for copper. Fig. 3 is a similar comparison map for cobalt, but this can be used only if molybdenum is less than 0.25 per cent.

Fig. 4 is a comparison map for molybdenum and Fig. 5 a similar map for tungsten.

Self-Contained Dolomite Machine



■ Making up the banks of open-hearth furnaces is facilitated by the use of an improved dolomite throwing machine offered by Blaw-Knox Co., Pittsburgh. A generator, driven by either a diesel or gasoline engine, develops the electric power needed for the motor which drives the dolomite throwing mechanism, and also for the motor which propels the machine along the rails. This enables the machine to transport dolomite from storage as well as throwing it to the furnace banks, without any aid from a crane.

The hopper is fitted with trunnions for engagement with the hot

metal ladle hooks of the floor crane, so that it can be used by itself to transport dolomite from storage to the open-hearth floor. Hopper capacities are made to hold sufficient material to make up banks for three heats.

Another improvement is provision, when desired, of a divided hopper, so that raw and double burned dolomite can be handled at the same time by the mere manipulation of separate levers. The illustration shows the operator's side of a machine of 300 cubic feet hopper capacity, equipped with gasoline-electric generator set.

Older Machines Can Handle Cemented Carbide Tools

By JAMES R. LONGWELL

Chief Engineer
Carboloy Co. Inc.
Detroit

■ *NATIONAL* defense production is bringing back into active service a great amount of machine tool equipment which had been "retired". Also, it is putting increased responsibilities upon active machines not of latest model. Under these conditions it is natural that this question is arising in machine shops throughout America: "Can cemented carbide tools be applied to these older machines safely and effectively, and if so, what special precautions must be taken?"

In the accompanying article, James R. Longwell, chief engineer, Carboloy Co. Inc., Detroit, not only answers this important question in the affirmative—insofar as equipment in reasonably good condition is concerned—but also gives definite directions for testing and conditioning older machines before imposing upon them the responsibilities attending carbide tooling

Modern machine tools are of course preferable to those of older vintage—particularly when use of the latest cutting materials is involved. However, at a time like this when there are "not enough new machine tools to go around", it is up to industry immediately to get the utmost out of every usable piece of equipment while awaiting delivery of something better. In no other way can a defense production crisis be avoided.

■ IN SPITE of rapid adoption of cemented carbide tools to increase productive capacity of newer machine tools, considerable misapprehension still exists in industry as to the useability of these tools in connection with older types of equipment.

Actually there is no reason why numerous older machines in good condition—turret lathes and boring mills, for instance—cannot readily be adapted to carbide tooling. The fundamental consideration in old equipment just as in case of new is that the machine must be able to run fast enough, also smoothly enough at the increased speed.

In cutting steels with carbide tools the main requirement is that cutting speed should be high enough to prevent formation of a "built-up" edge. This means an average cutting speed in the neighborhood of 200 feet per minute. The lower the carbon of the material cut, the higher the speed, is the usual rule.

To check adaptability to use of carbides of any

available piece of machine tool equipment, the following must be considered:

Power Requirement: It takes more power to run at the higher speeds required—to remove metal at a faster rate. It takes more power, also, to cut steel than nonferrous metals or cast iron. Check the machine horsepower. Horsepower requirements can be calculated readily by the following formula: Horsepower per tool equals depth of cut in inches times feed in inches times surface feet per minute times power constant. This power constant varies from 6 to 10, depending on the steel to be cut, as follows: 6 for S.A.E. 1010-1025, 1112-1120; 7 for 2015-2320; 8 for X1314-X1340, 3115-3130; 9 for T1330-T1350, 2330-2350, 3135-3450, 4130-4820 and cast steel; 10 for 5120-52100 and 6115-6195.

Power required to operate the machine up to speed with tools not cutting must of course be added to the above to obtain full motor horsepower. This requirement is usually figured as 30 per cent of the horsepower required for cutting.

Power Transmission: All belts, clutches, etc., should be checked for ability to transmit the required horsepower to the spindle. Clutch fingers should be adjusted to prevent slipping and stalling. If the machine is equipped with a flat belt, it usually is desirable to change to multiple V-belt drive, making sure that the number of belts is adequate. If machine stalls in the cut, loosen holding screws and remove tool from the cut to prevent breakage. Do not attempt to move work or try to back tool out of cut.

Centers: Increased rate of stock removal at high speeds with cemented carbides makes it advisable to use an antifriction tail stock center.

Spindles: Spindles should be checked to make sure that they will receive adequate lubrication at the increased speeds at which they will operate.

Tool Posts and Holders: Where machines have rocker tool plates, these should be eliminated and a solid support provided. A set of shims should also be provided to maintain the tool at proper cutting height.

Chip Room: Provisions must be made for handling the considerably increased volume of chips. Where existing openings in machine beds and around tools holders or blocks are too small to allow chips to escape rapidly, sheet metal chutes frequently will prove helpful by eliminating pockets and slots where

(Please turn to Page 84)

High-Production

Cleaning, Pickling and Plating Line

New processing line cleans, pickles and deposits zinc coating on 4000 pounds of small parts hourly. Seven men easily handle this output aided by power hoists, automatic transfer hoppers

■ IN AUTOMOTIVE plants as in other high-production manufacturing setups, the tremendous volumes which are necessary to be handled involve certain processing problems. Quite often the manner in which these are solved is of particular interest.

For instance, the Chrysler-Plymouth plant in Detroit employs an unusually and highly efficient arrangement of equipment to clean, pickle and plate a variety of small parts in a new continuous production line some 98 feet long. These operations, especially the cleaning, would be done only with considerable difficulty if the ordinary dipping basket method had been used. This equipment was furnished by Hanson-Van Winkle-Munning Co., Matawan, N. J.

Some 4000 pounds per hour of work is processed. Most of it is small parts such as machine bolts, nuts, washers and various irregular shapes as shown on the board at extreme left center of Fig. 2. As the work comes into the plating room, it is dumped into a large steel bin. The operator uses a shovel to load the monel cylinders which are used in the cleaning and pickling

section, up to the transfer hopper, see Fig. 1. Each monel cylinder is 30 inches long, 14 inches in diameter and holds around 300 pounds of parts—about the equivalent of two plating loads as the 12 Mercilite cylinders used in the two six-station zinc platers hold from 100 up to 200 pounds per load, depending on size of parts.

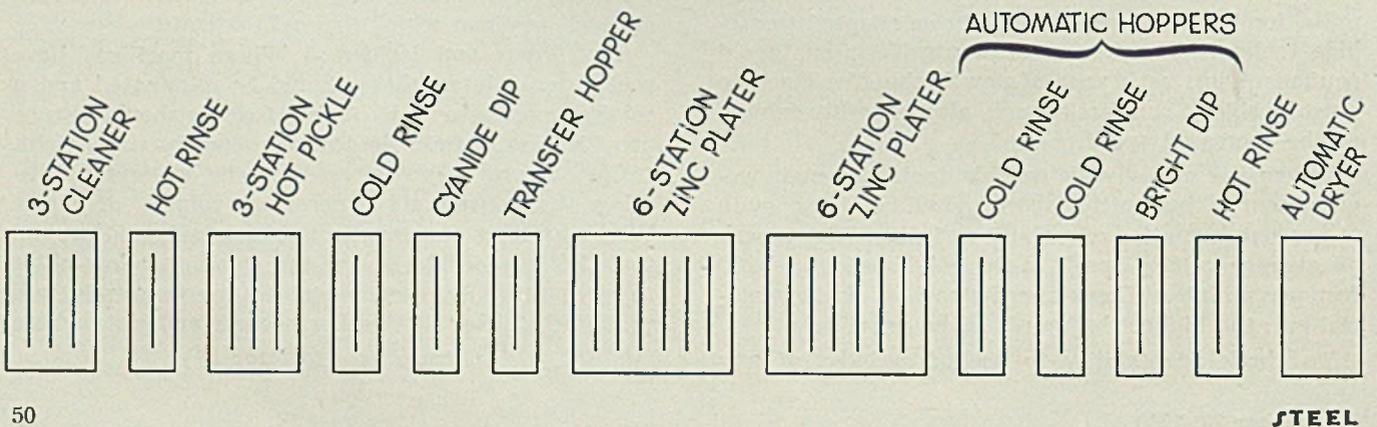
When a monel cylinder is loaded with work, it is transferred to the three-station cleaner, the first tank in the cleaning section of the line, Fig. 1. All of the tanks are in sequence down the length of the plating department as shown in Fig. 2, forming some 98 feet of equipment. This is believed to be one of the longest straight-line mechanical plating setups in the country.

Seven of the monel cylinders are employed in the cleaning and pickling unit which forms the first section of this line up to the transfer hopper, Fig. 1. The cleaning and

pickling section consists of a five-compartment double-welded steel tank which includes a three-station cleaner with room for three tanks, a single-station hot rinse, a three-station hot muriatic acid pickle, a cold rinse tank and a cyanide dip tank. The cleaning solution, muriatic pickle bath and hot rinses are operated at approximately 160 degrees Fahr. Steam coils are employed to heat the bath. The pickling unit is a rubber-lined steel tank with a lead heating coil. Both the pickling compartment and the rubber-lined cold rinse compartment are furnished with monel ventilating systems. Cleaning and pickling equipment employ leaded phosphor bronze gears and hangers.

A complete mechanical handling system facilitates operation of the entire setup. Note in Fig. 2 two lines of overhead monorail track between which operate monorail bridges carrying electric hoists. Three of these bridges are shown in Fig. 2. They make it easy to pick up cylinders and transfer them from one bath to the next at any point in the line.

After a load of parts has passed through the cleaner, hot rinse,

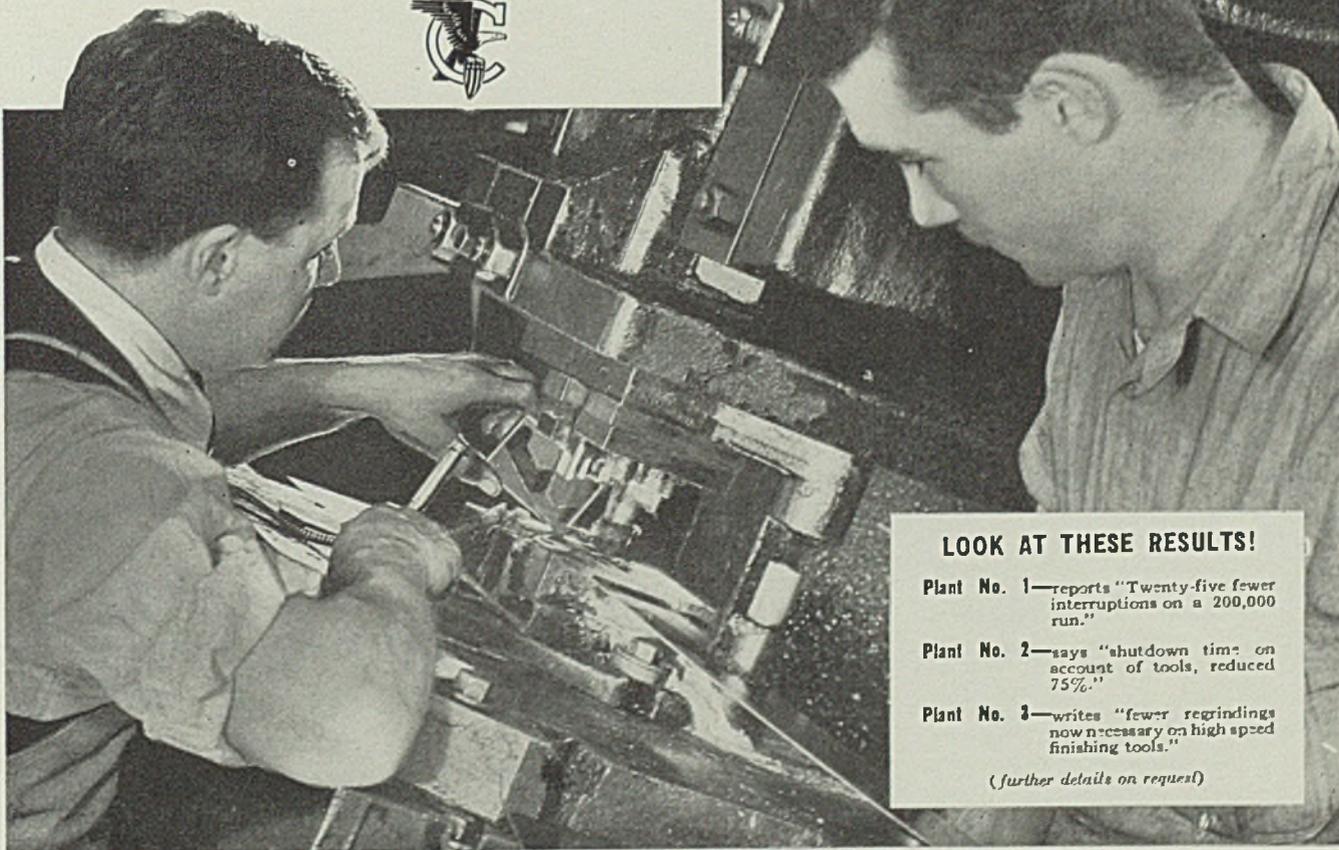


HOW often are your tools and dies interrupting production unnecessarily?

Every time a tool dulls or falls short of its job in any way—a press must be shut down until the tool has been reground or replaced. When this occurs in your plant it may mean losing an hour—a half day—or several days. Meanwhile you have an expensive piece of equipment standing idle—production is interrupted—schedules are upset—and unit costs go higher.

Guard against such production interruptions by putting Carpenter Matched Tool Steels to work for you. These modern, Tough Timbre tool steels with their extra margin of safety have helped solve the "interruption problem" in many plants. Find out about the higher output per machine and lower cost per piece now being obtained by users. Send the coupon below for your free copy of new illustrated booklet—shows how to get similar results in your plant.

THE CARPENTER STEEL CO., READING, PA.



LOOK AT THESE RESULTS!

Plant No. 1—reports "Twenty-five fewer interruptions on a 200,000 run."

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pickle, cold rinse and cyanide dip bath, the parts are dumped out of the monel cylinder into the transfer hopper.

When an operator empties the contents of one of the monel cylinders into the transfer hopper, that cylinder is returned to the starting line of the cleaning and pickling section for another load. Work going through the pickling and cleaning cycle is rotated in the monel cylinder which gives much better results than when the work is put through the cleaning and pickling cycle in baskets. The fact that the work tumbles in the cylinder results in a faster and better finish.

The 14-inch diameter, 30-inch long plating barrels then are loaded from the transfer hopper. Two automatic motor-driven 6-station plating tanks are employed. Dangler contacts are used. Plating equipment is furnished complete with ventilating systems and cooling coils. The load in the plating cylinders runs from 100 to 175 pounds with 200 pounds as a maximum. The plating baths operate at 14 volts and draw in the neighborhood of 400 to 425 amperes per cylinder. After plating for about 20 minutes in the zinc cylinder cyanide solution, the plating cylinder is raised from the tank and its contents dumped into the first of the series of four automatic hopper tanks.

These automatic hopper tanks are

controlled by magnetic switches and are set to operate in sequence. After the first hopper tank is loaded, the operator pushes the "start" button. Parts which have been discharged into the hopper tank fall to the bottom upon a hinged section or hopper which is connected to a ½-horsepower motor through a gear reducer. By means of a crank arm, the work is gradually lifted to the top of the tank and tipped to discharge into the adjoining hopper tank.

A limit switch is provided so when the hinged section or hopper has reached maximum position and work has been discharged, the section is lowered again into the tank. Now it is ready to receive the next load. This discharge cycle takes 55 seconds.

To avoid dumping two adjacent hoppers at the same time, interlocks are provided which prevent the second hopper from starting its dumping cycle until the first hopper has completed its cycle. When the second hopper completes its cycle, the third hopper starts automatically and the first hopper

can then be started for the second time by pushing the "start" button. If the operator pushes the "start" button on the first hopper before the second hopper has completed its cycle, the first hopper will not discharge.

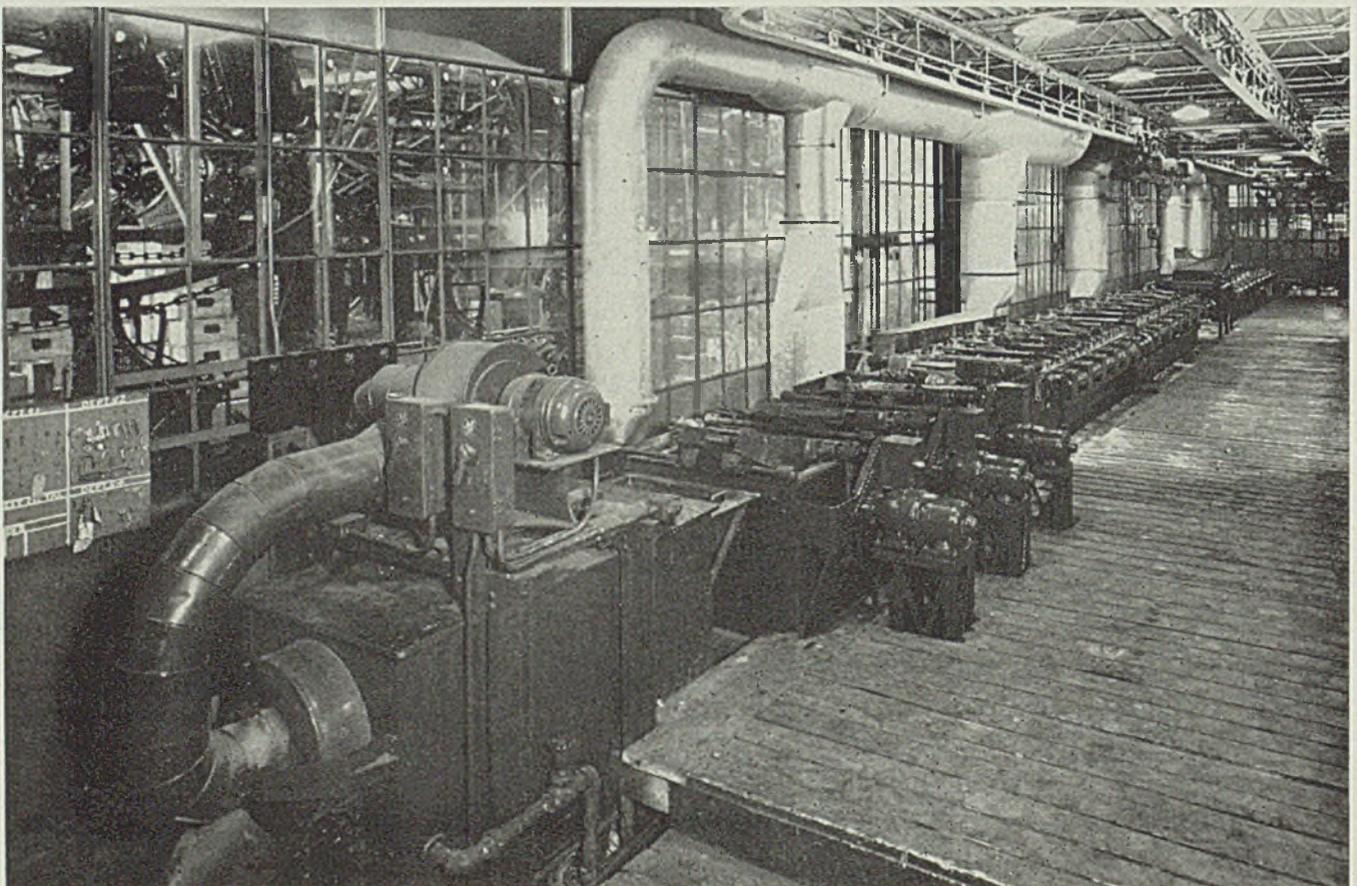
At the same time, once the automatic cycle has been initiated by pushing the "start" button for the first hopper, work will be transferred to succeeding hoppers automatically by means of limit switches which put the work through the tanks in succession to discharge finally into the automatic dryer at the end of the line shown at the immediate left foreground, Fig. 2.

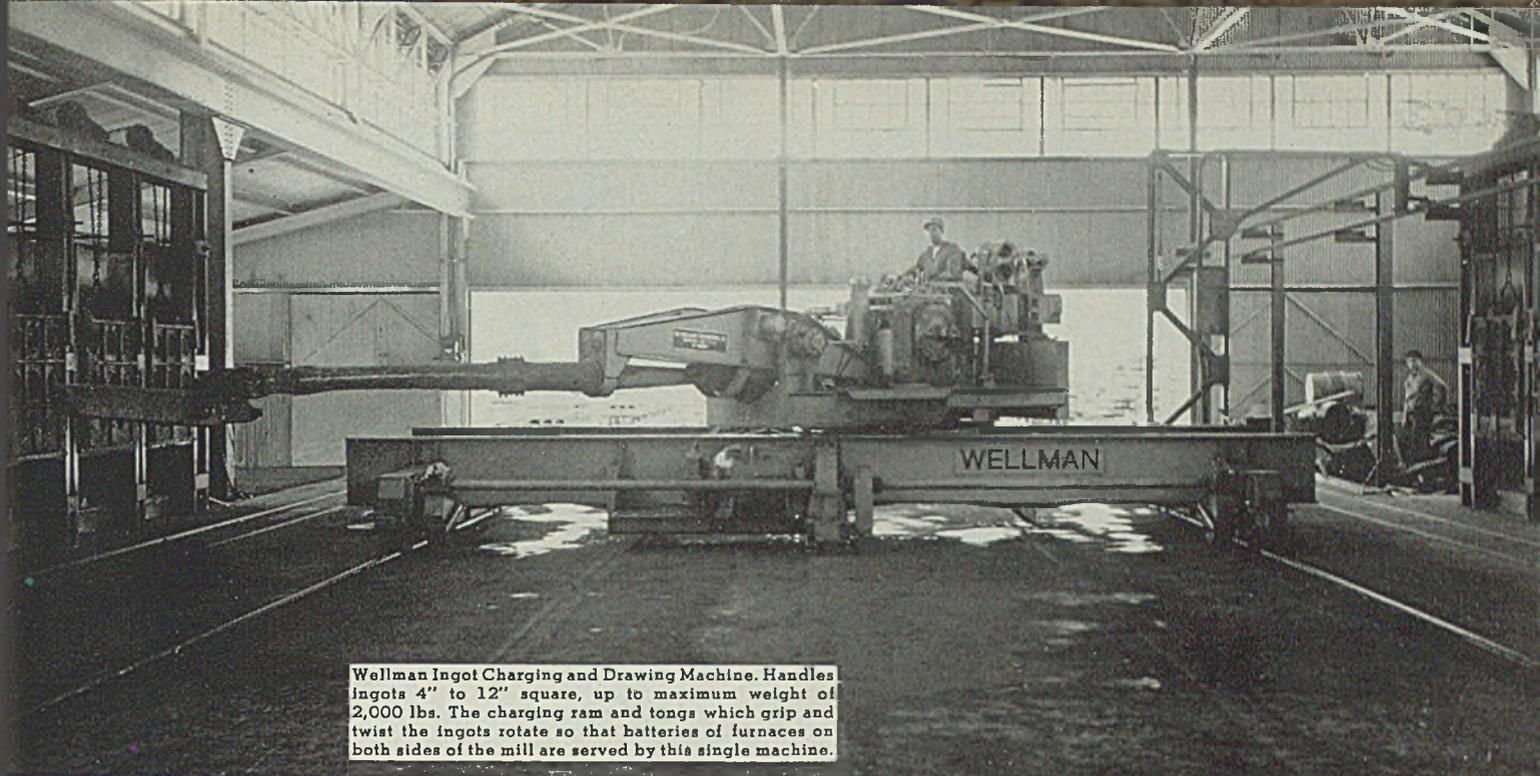
From the time the "start" button on the first hopper is pressed, it takes 55 seconds for the hopper to rise and return back to its cleaning position. From the time this button on the first hopper is pushed until all the work is transferred to the next hopper, 20 seconds elapse. From the time the button on the first hopper is pushed until the fourth hopper comes back to cleaning position, 3 and 2/3 minutes elapse.

Provided the first hopper is loaded continuously and as soon as the cycle of operation permits, production is one hopper load into the automatic dryer every 110 seconds.

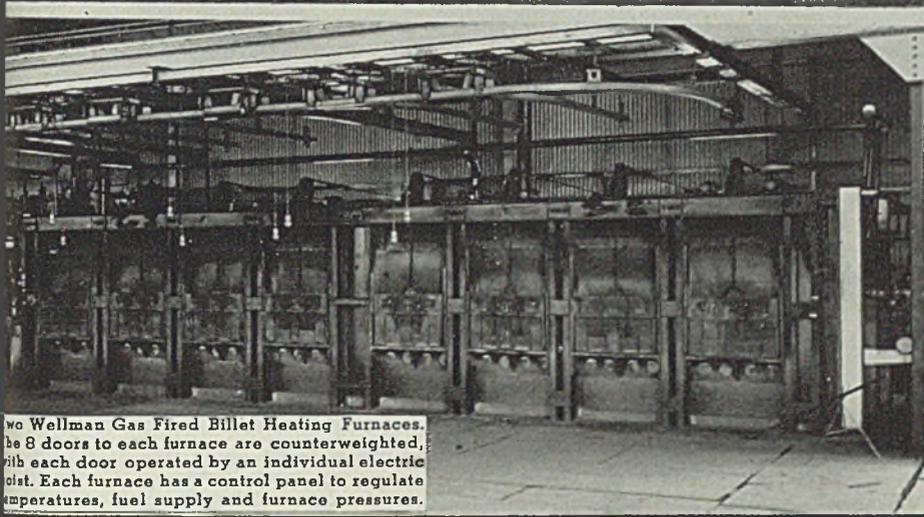
It is understood that as the first
(Please turn to Page 84)

Fig. 2—View of processing line as seen from dryer end. Note typical small parts mounted on display board at center, extreme left. Bridges between the two rails overhead carry electric hoists which facilitate movement of cylinders from tank to tank





Wellman Ingot Charging and Drawing Machine. Handles ingots 4" to 12" square, up to maximum weight of 2,000 lbs. The charging ram and tongs which grip and twist the ingots rotate so that batteries of furnaces on both sides of the mill are served by this single machine.



Two Wellman Gas Fired Billet Heating Furnaces. The 8 doors to each furnace are counterweighted, with each door operated by an individual electric hoist. Each furnace has a control panel to regulate temperatures, fuel supply and furnace pressures.

WELLMAN

Steel Plant FURNACES



Four Wellman Gas Fired Ingot Heating Furnaces. The six doors to each furnace are counter-balanced and operated by individual electric hoists. Temperatures, fuel supply and furnace pressures are all regulated.

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— the largest plant in the world devoted exclusively to the production of rustless and stainless steel ingots, billets, blooms, slabs, sheet bars, bars, rods and wire.

THESE Wellman Furnaces for the heating of alloy ingots and billets to a rolling temperature of approximately 2100° represent the last word in design, insulation, heat control and automatic operation.

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Other Steel Works Equipment built by Wellman includes: Blast Furnace Skip Hoists; Buckets—"Williams" Clam Shell Bridges—Ore, Coal Stock and Rehandling Cars—Ore Transfer, Coke Quenching, Coal Charging, Larry, Ingot, Open Hearth; Cars Dumpers—all types; Charging Machines; Cars and Boxes; Coke Oven Machinery—Combination Pushers, Coal Levelers, Door Extractors, Coke Guides, Coal Charging Cars, Quenching Cars; Cranes—Gantry and Special Purpose; Furnaces—Open Hearth Soaking Pits, Continuous and Reheating Metal Mixers; Hoists—Blast Furnace Skip and Mine Hoists; Manipulators—Forging and Special; Producers—Wellman Mechanical Gas and Fuel Feeds for Raw Gas from Bituminous Fuels—Wellman Galusha Generator for Clean Gas from Anthracite and Coke Breeze Fuels—Flue Systems; Unloaders—Ore Unloaders; Valves—Gas and Air Reversing

THE WELLMAN ENGINEERING CO.
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Control of Spangles

Tests disclose that with all other factors standardized any increase in temperature of galvanizing bath results in heavier coating of zinc on base metal. Importance of the submersion time is stressed

■ TEMPERATURE of the galvanizing bath, and the length of time of submersion in the galvanizing bath, are perhaps two of the most vital factors in the development and control of spangles on galvanized iron. Regardless of the metal additions these two factors affect all types of coatings and finishes.

Since the submersion time has not been definitely controlled in practice the influence of time-in-bath is not clearly understood. A typical example of the variation in submersion time is seen in the hot-dip galvanizing of pipe. A large number of pipe may be pushed into the galvanizing bath at once, and then removed one or two at a time. Thus, the submersion time of those drawn first is short while the submersion time of those drawn last is long. The practical galvanizer therefore is interested to know what happens to the pipe as the submersion time in the bath increases. Some pipemakers desire

By WALLACE G. IMHOFF

President, Wallace G. Imhoff Co.
Vineland, N. J.

a spangle finish while others do not.

Fig. 1 shows what happens to the spangle when every other condition has been standardized except the temperature of the galvanizing bath. The submersion time is the same for all the sheets; namely, 30 seconds. At the temperature of 790 degrees Fahr. (just 4 degrees above the melting point of zinc) the spangle is fairly large and the finish is dull. With the same submersion time, but at a much higher temperature of the bath, the spangle formed is much smaller, and the finish is much brighter. This is at 885 degrees Fahr., and 30 seconds submersion time. The third sheet shows a bath temperature of 945 degrees Fahr., considerably above practical galvanizing conditions. The submersion time is the same as the

others, namely, 30 seconds, but the spangle has disappeared; the coating or finish has been "burned," that is, the bath is too hot for that gage of sheet and that submersion time to develop a commercial spangle, or finish. So that the higher the bath temperature, the smaller the size of the spangle developed, and vice versa when all other factors are definitely controlled, the lower the temperature the larger the size of the spangle will be. If a 30-gage sheet is run through a galvanizing bath too slow at a high temperature the finish will be white, that is, the spangle will be burned off. The remedy is either to lower the bath temperature, or increase the speed of the sheet through the bath. The best operating temperature and speed has been determined for each gage of sheet.

Coating Speed Is Important

Stepping up the speed may drag out excessive zinc, and thus increase the weight of the base metal. On the other hand if the sheets go through too slowly the coating may become hard and brittle due to excessive alloying. There is an equilibrium between the factors of bath temperature, submersion time, gage of base material, and speed through the bath, that must be determined to give the best spangle development, the lightest metal deposit, and the best finish as to smoothness, gloss, etc.

Low-temperature coatings are soft and ductile, although the sheet will stand considerable bending; high-temperature coatings are hard and brittle, and they tend to crack upon bending. If the submersion time is short a burned finish which destroys the spangle, will stand considerable punishment in the way

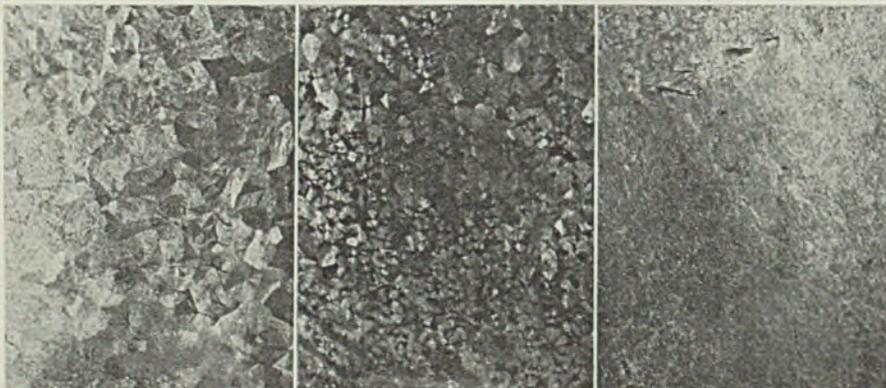
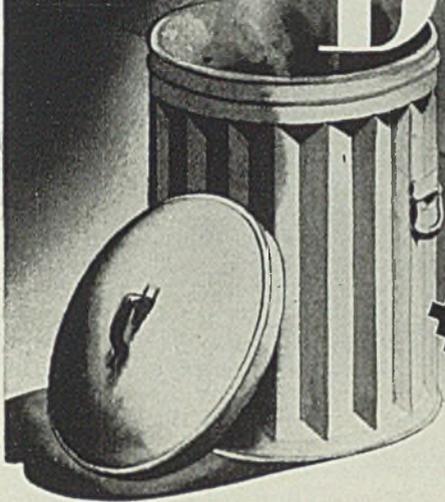


Fig. 1—Effect of increase in bath temperature upon the character of the spangle. Bath temperatures, from left to right, are 790, 885, and 945 degrees Fahr., respectively. All samples are 30 gage

The Case of the BURNED BEEF STEW



**SOLVED
WITH
PREVENTIVE
MAINTENANCE**

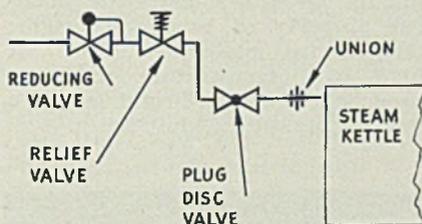
YOUR PLANT IS SAFER WITH CRANE RELIEF VALVES

You may never have occasion to worry over scorching a beef stew, but in your plant—in fact, in almost every plant—the judicious application of relief valves on pipe lines will prevent many maintenance problems from becoming serious—save many dollars in time lost or material destroyed, as well.

Crane relief valves are made in brass, iron and steel—designed to control air, gas, water or steam. Available in sizes from $\frac{3}{8}$ " to 5" to meet every requirement where a relief valve may be necessary.

HERE'S how the chef in a mid-western hospital discovered something about valves that is significant to any plant with extensive piping. The chef raised the lid of a steam kettle ready to dish up a savory beef stew. Instead, he found a badly scorched mess.

By his clock he knew that it had not cooked too long—the heat should



have been constant—but something had happened—something beyond his control.

The engineer of the hospital diagnosed the trouble thus: "Pressure regulator's gone blooey," he stated. "Look at the sediment in this reducing valve. If you had that much junk inside of you, you would fail, too."

When W. F. C., the Crane Represent-

ative, appeared in response to a telephone call, he quickly found the answer. Obviously, simply cleaning the regulator was asking for more trouble later—Preventive Maintenance dictated some form of protection for the kettle to prevent extreme temperature from ruining more food.

The answer was simple—see the hookup at left. A Crane relief valve, placed on the low pressure side of the pressure reducing valve, gave assurance that in the future, failure of the pressure regulator would not result in further disaster to beef stews.

RESULTS: (1) No more danger of uncontrolled steam under high pressure reaching the cooking kettles. (2) One more user of valves and fittings has learned that Preventive Maintenance prevents further trouble from valves by recommending the correct valve of the correct materials in the correct hookup. (3) Another valve user has found that he can be assured sound advice on piping problems by calling the Crane Representative.

This case is based on an actual experience of a Crane Representative in our Kansas City Branch.



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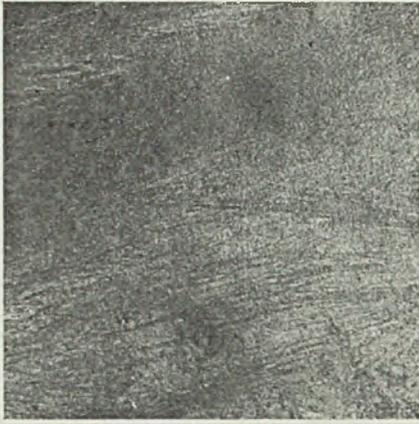


Fig. 2—This 28-gage sheet was submerged one minute in galvanizing bath at 945 degrees Fahr. This temperature and time ruins spangle development

of bending; if the submersion time increases and the alloy formed becomes heavier, the coating tends to become more brittle and breaks away from the base metal.

The law of crystallization generally follows the principle that slow cooling develops large crystals and that the higher the temperature from which it is cooled, the larger the crystals will be. This law of crystallization holds true with the size of the spangles. The crystals at 885 degrees Fahr. are smaller because of faster cooling.

Temperature Influences Action

Alloying action goes on at a faster rate the higher the temperature of the galvanizing bath. At 945 degrees Fahr. all the free zinc has combined with the base metal to form the frosted looking zinc-iron alloy, and there is no top skin of purer zinc to give the spangle effect. The finish therefore at 945 degrees Fahr. is really a zinc-iron alloy. The finish at 790 degrees Fahr. is the most ductile, therefore, of the three finishes shown, and that at 945 degrees Fahr. the most brittle because of the formation of more zinc-iron alloy.

Experiments and tests have shown conclusively that when all features are standardized as here illustrated, the principle is—The higher the temperature of the galvanizing bath, the heavier the zinc deposited as galvanized coating, and vice versa, the lower the temperature of the galvanizing bath the lighter the zinc coating deposited. Exactly the opposite to this was believed to be true in practice, until it was conclusively proved, by standardizing all other factors, a thing which is impossible under practical operating conditions.

In Fig. 1 all conditions were standardized but the bath temperature; in every case the submersion time was 30 seconds in the bath.

Figs. 2, 3 and 4 show the submersion times of one minute, two minutes, and four minutes. The effects of 30 seconds, one minute, two minutes and four minutes on the coating are eligible. The results show what transpires as the submersion time is lengthened.

Comparison of the finish of each of these sheets with the one following clearly reveals that the longer the submersion, the greater the effect of alloying with the base metal. Finally at four minutes submersion the spangle has not only been entirely destroyed, but a heavy zinc-iron alloy has been built up on the surface of the sheet. At first the grains are fine, but with longer submersion they increase in size. The coating changes from a spangle to a hard, sandy, grainy, zinc-iron alloy finish. A long submersion therefore destroys the spangle the same as a high bath temperature. The same results are accomplished at a low temperature with a long submersion time, as with a high

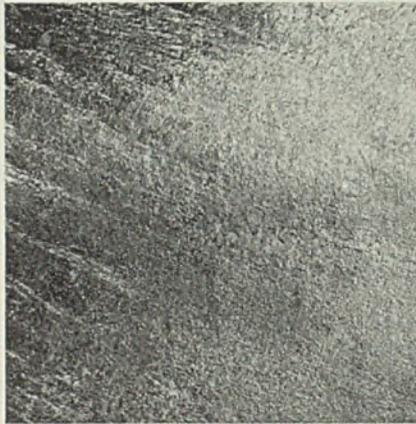


Fig. 3—This 28-gage sheet was submerged two minutes in galvanizing bath at 975 degrees Fahr. The surface shows active alloying of zinc and iron

temperature and a short submersion time; in both cases the spangle is completely destroyed and the finish replaced by a rough, sandy, zinc-iron alloy deposit.

Another important factor is the extreme brittleness of the zinc coating. Note the corner of the coating that has been easily broken off of the sheet shown in Fig. 4. The adherence of this coating was low, but was thick, hard and brittle.

Pipe at the last draw which has the longest submersion time tends to have a dull, heavy, brittle coating, with low adherence, that is, the coating peels and flakes easily. To overcome this difference in coating quality due to the variation in submersion time, involves rigging up some kind of a machine that will take each pipe separately and give it exactly the same submer-

sion time as every other pipe; in other words, the submersion time of all the pipe must be made equal to secure a coating that will be of uniform quality.

The weight of coating also should not be overlooked with the submersion time. Careful tests have revealed that the longer the submersion time, the heavier the zinc will be deposited as galvanized coating, and vice versa, the shorter the submersion time, the lighter the zinc will be deposited as galvanized coating. As a corollary to this principle there is also another, namely, the longer the submersion time the more brittle the zinc coating, and vice versa, the shorter the submersion time the more ductile the zinc coating. Still another principle is important, namely, the longer the submersion time the lower the adherence of the coating to the base metal; and, vice versa, the shorter the submersion time, the more ductile will be the zinc coating.

Thus, there are at least three vital galvanizing principles clearly illustrated in this series of sheets, in addition to showing the effect upon the spangle, when the bath temperature is too high, or the submersion time too long.

Temperature and submersion time are operating factors for controlling, developing and extinguishing the spangle. They may be termed factors of spangle control as distinguished from metal additions to the bath which directly affect the type and the character of the spangle developed. Cadmium produces the "pearl spangle," but the temperature of the bath influences its size, luster and development. Aluminum gives a spangle the inherent property of becoming bright; temperature makes it bright. A high bath temperature tends to produce a beautiful bright luster; a low temperature a dull finish.

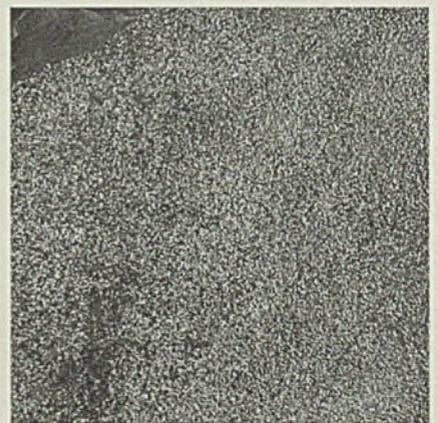
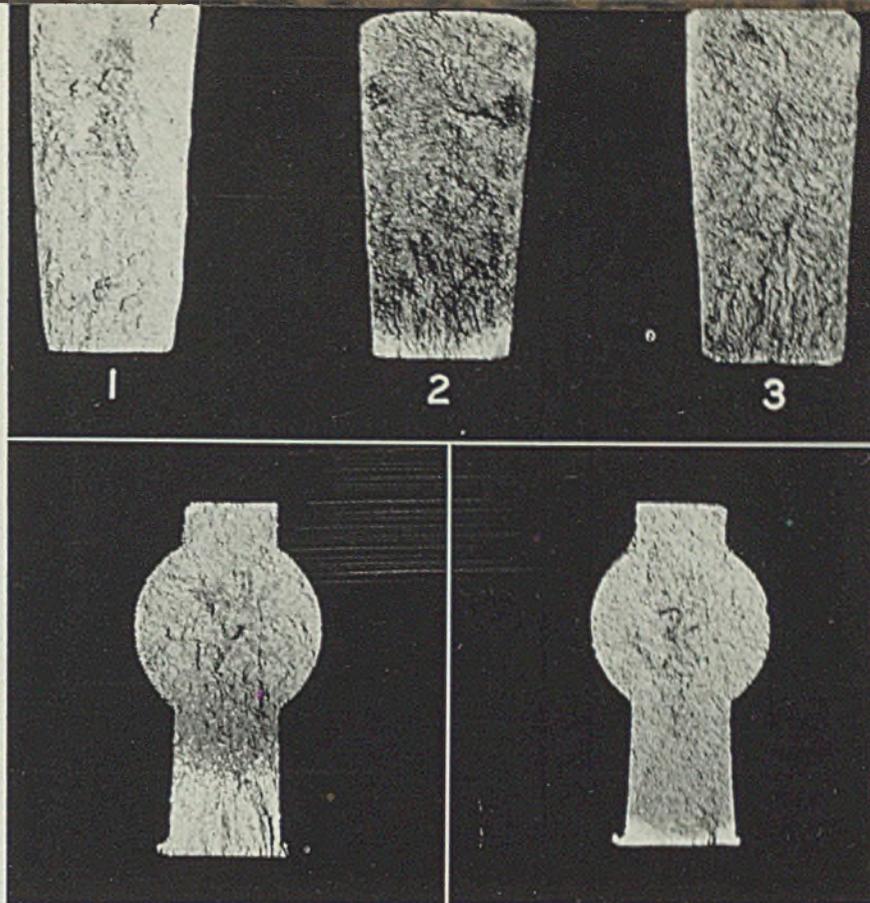


Fig. 4—This 28-gage sheet was submerged four minutes in galvanizing bath at 910 degrees Fahr. Note the hard, grainy, brittle texture of the finish



New SMZ Alloy Transforms White Cast Iron to Strong Gray Iron

■ **THREE** beneficial results are accomplished by the new graphitizing alloy SMZ recently developed as a ladle addition to cast iron by Electro Metallurgical Co., unit of Union Carbide & Carbon Corp., 30 East Forty-second street, New York. Composed essentially of silicon, manganese and zirconium, it converts a normally hard white iron into a high-strength gray iron, reduces the chill of gray iron and minimizes wall sensitivity. It also improves the microstructure of the iron with resultant improvement in strength and physical properties.

The effect of SMZ alloy on white cast iron is shown in Fig. 1. The base iron used to make the wedge-shape chill blocks contained approximately the following percentages: 2.30 carbon, 1.00 to 1.10 silicon, and 0.30 manganese—and was melted in a commercial air furnace. The specimen of iron that had not been treated at the extreme left, Fig. 1, was a hard white iron. When enough SMZ alloy was added to raise the silicon percentage of the iron to approximately 1.60, the iron became almost completely gray except near the chilled edge. When more alloy was added to raise the final silicon percentage to approximately 1.90, the iron became gray throughout.

Fig. 1. (Upper)—Typical white iron structure is shown by test specimen at left. Those on the right show the gray-ing effect of increasing amounts of SMZ alloy added to the white iron. Fig. 2. (Lower)—The chill of gray iron, represented by keyhole specimen at left, is reduced by additions of SMZ alloy as indicated by the specimen on the right

That this alloy is equally effective in reducing the chill of gray iron and in preventing the chill of thin sections of this material is indicated by the illustrated keyhole chill blocks, Fig. 2, the base having these percentages: 3.26 total carbon, 0.63 combined carbon, 2.33 silicon, and 0.66 manganese. To the specimen shown on the right, Fig. 2, 1-pound additions of the new alloy were made per 500 pounds of iron.

The action of this alloy is not due to its silicon content alone, and its

beneficial action is not merely graphitizing. For example, the base irons used in obtaining the data given in the accompanying table had progressively lower silicon contents so that progressively increased additions of SMZ alloy would result in essentially constant final silicon analyses. Therefore, the progressive improvement in mechanical properties given in the table is due to the ladle addition of a balanced combination of elements.

A cast iron converted from white to gray by the addition of SMZ alloy had the following properties:

Tensile strength, lb. per sq. in.	51,700
Transverse strength, lb.	3,800
Deflection, in.	0.415
Brinell hardness number	207

The base iron had the following percentages: 2.66 total carbon, 1.15 silicon, and 0.36 manganese. The amount of SMZ alloy added was sufficient to increase the silicon by 0.50 per cent.

Effects of Ladle Additions of SMZ Alloy on Physical Properties of Gray Cast Iron

Addition Si as SMZ Alloy	Final Analysis			T.S., lb. per sq. in.	Trans., lb.	Defl., in.	Depth of chill, in.	BHN
	T.C., %	C.C., %	Si, %					
0.00	3.15	0.57	1.80	26,400	1,900	0.185	1.09	207
0.15	3.08	0.57	1.76	39,000	2,250	0.210	0.686	207
0.25	3.14	0.63	1.81	42,400	2,600	0.240	0.56	198
0.50	3.07	0.58	1.76	43,900	2,750	0.250	0.43	198

Novel Hook-Up Eliminates Necessity for Skilled Workers

■ UNUSUAL simplicity of operation possible when universal duplicating control is used in combination with a standard horizontal boring, drilling and milling machine permits a boring machine operator, hitherto unskilled in die duplicating, to turn out dies to required accuracies.

An example of the application of this combination of horizontal boring machine and duplicator, the latter manufactured by Detroit Universal Duplicator Co., 253 St. Aubin avenue, Detroit, is shown in the accompanying illustration.

The combination, in use at the Superior Tool and Die Co., Detroit, is enabling the company to meet delivery dates on this season's unusually large number of dies. Rapidity with which the control can be connected with any suitable standard machine tool such as a boring machine, permitted the company to order the duplicating control after the work was already in the shop.

While this combination of boring machine and control unit represents the least costly of any single piece of duplicating equipment in the shop, its speed of operation and accuracy is ample to meet all requirements.

The control unit, which is connected with longitudinal feed of the boring machine, automatically controls that feed to regulate the depth of the cut. Vertical feed is governed by the machine itself, leaving to the operator only the shifting of the table longitudinally for each new cut.

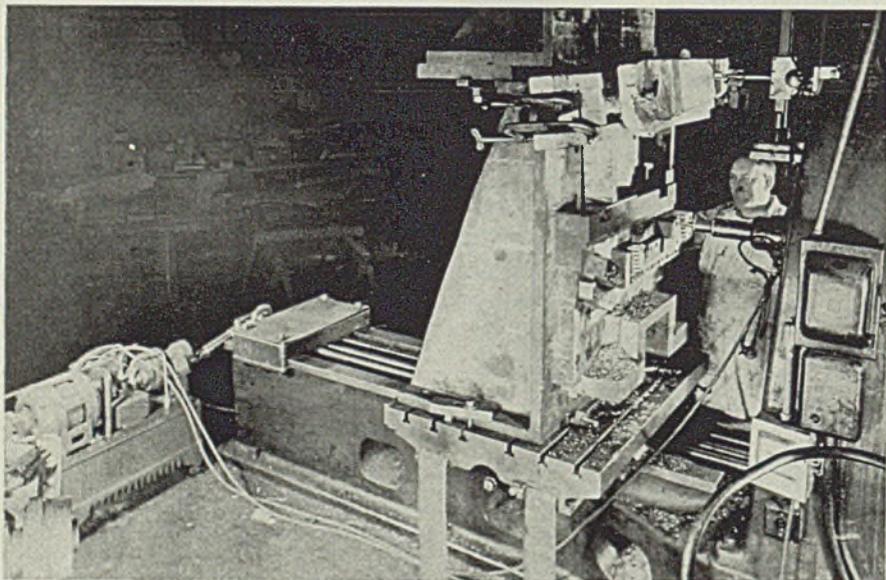
Pattern (plaster of Paris) and work (tool steel for inner door pier-

ing die) are mounted on an angle plate on the worktable, just as in a standard vertical die sinking machine. Tracer head is mounted on headstock of the boring machine and its tracer finger is lined up with the cutting tool vertically in two planes with both the finger and the cutting tool touching identically corresponding points of pattern and work respectively.

When vertical feed is started, the tracer, following the pattern, relays an interrupted series of electrical impulses to a solenoid controlled plunger-type valve which permits oil under pressure from a hydraulic pump to actuate a hydraulic motor for control of the longitudinal feed of the worktable. In this manner the unit limits the depth of the cut being made in close accordance with the contour of the pattern.

Simplicity of operation and elimination of necessity for especially trained operators to handle such equipment will enable the setup to be placed on a 24-hour basis if needed. Based on the time required to train the single operator now using the setup to produce satisfactory

Simplicity of operation, ease of installation permits the control unit shown in the illustration to be connected up with standard horizontal boring, drilling and milling machine for die duplicating, the combination being handled successfully by an operator without previous die duplicating experience. Depth of cut, to conform to pattern mounted on angle plate fixture is controlled by duplicating control unit shown in background



work, the company anticipates no difficulty in putting two additional operators on the machine to round out the three shift operation.

Story of Superfinish In Pioneer Volume

■ *The Story of Superfinish*, by Arthur M. Swigert Jr.; cloth, 672 pages, 6 x 9 inches; published by Lynn Publishing Co., Detroit, for \$5.

The author of this work is director of production research for the Chrysler Sales division, Chrysler Corp., Detroit, and his book is a notable contribution to the literature of machined surfaces. Dedication is to Walter P. Chrysler, chairman of the board; K. T. Keller, president; and David A. Wallace, president Chrysler Sales division.

The latter first conceived the necessity of some such process as superfinishing and was in active charge of the work leading to its development as a commercial success. Mr. Wallace says of this volume: "The story contained in this book is of vital importance to all who are interested in industrial progress. It is of particular interest to the scientist, physicist, engineer, metallurgist, foreman, tool-maker and mechanic."

The text of 300,000 words is accompanied by 720 photographic illustrations and diagrams, each fully described in its own caption.

While the subject matter is a technical description in understandable language of the whole progress of surface finishing, it deals principally with the industrial development of metal surface finishing in the last three decades.

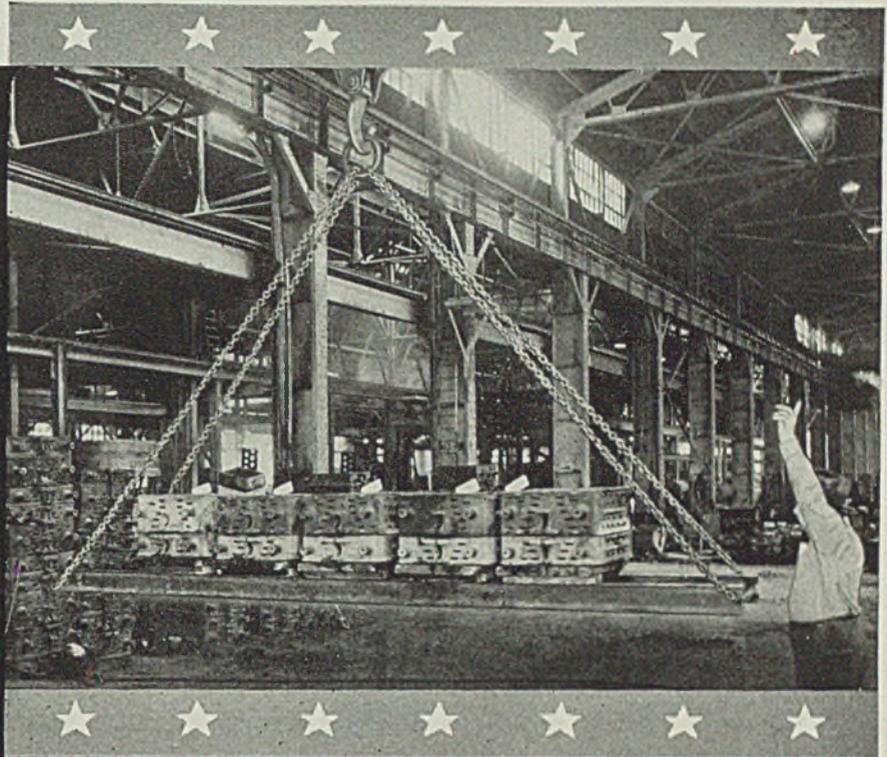
Uses of Copper Alloys In Aircraft Described

■ American Brass Co., Waterbury, Conn., has published a booklet describing copper alloys currently used in aircraft and aircraft engine construction.

Compositions, physical constants and physical properties of various forms are listed, with discussions on the fabricating qualities of the aluminum-bronzes, copper-silicon alloys and the heat-treated beryllium copper.

Booklet also explains principal characteristics of such special products as Anaconda hot pressed parts, pressure die castings, flexible metal hose and tubing for radio shielding conduit, rip cord housing, and flexible metal connections for air ducts, carburetors, heater pipes, vents and exhausts.

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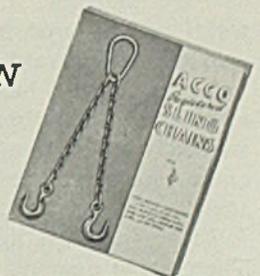
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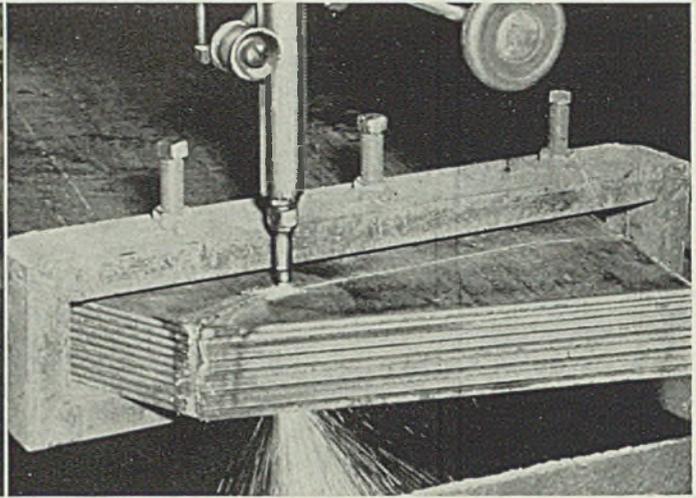
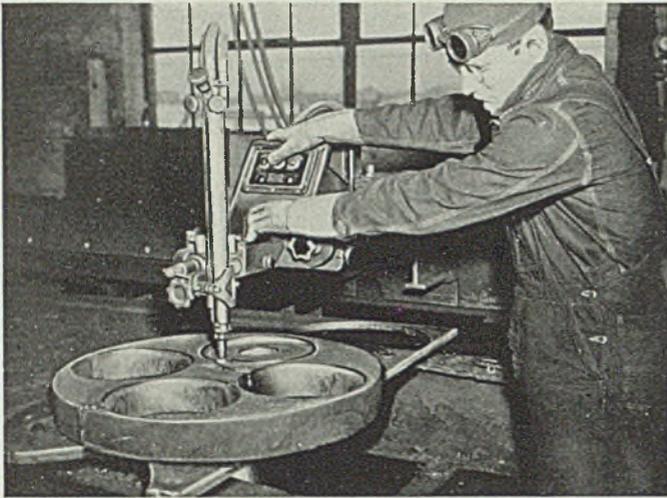


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Top left, perfect circles are but one of the many forms that can be cut quickly and accurately by machine flame cutting. Top right, stack cutting can help speed the production of identical parts for welding into machines

Oxyacetylene Process Helps Machine-Tool Production

■ BEFORE American industry can enter fully into the greatly increased production schedules proposed by the nation's full-fledged preparedness program, additional machine tools must obviously be built as quickly as possible. Any method, therefore, of speeding their production is of interest to manufacturer and user alike. Such processes as machine flame cutting, Unionmelt welding and flame hardening have reached an advanced stage of development and offer important short cuts.

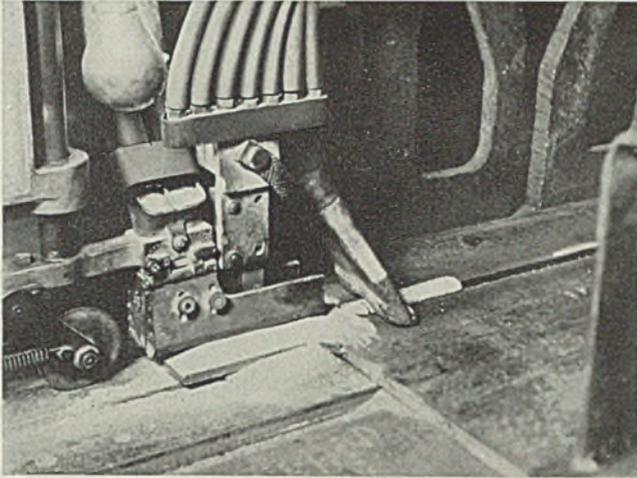
A wide variety of machinery parts—machine bases, frames, brackets, gears, cams, machine ways, levers, covers, and containers—can be fabricated speedily and economically by machine flame cutting and by welding rolled steel plate. The designer's hand is free to assign strength where strength is needed and by working with an inherently strong material, rolled steel, weight can be reduced and strength increased at the same time. In addition, different types of material can be used in the same unit to realize with economy the advantages of each, as in the case of a ring gear with a heavy hub of mild steel and a disk of alloy steel. A further advantage of flame cut and welded construction is its rigidity which in a machine tool serves to prolong the life of dies, cutting tools and other parts.

To these advantages can be added that of speed. The cutting machine operator can work directly from a blueprint, guiding the machine by hand, or in the case of quantity lots or very intricate shapes, can easily form a templet to follow the outline of the blueprint and use this as a track to guide automatically the tracing wheel. Quick changeover can be made from one design to another.

Modern oxyacetylene cutting machines are designed for a wide range of operations. These machines operate with "jig-saw" flexibility and can perform bevel cutting to produce edges ideally prepared for welding. The fabrication of highly specialized equipment can be undertaken economically, while on the other hand, mass production of identical parts is easy. By the use of several blowpipes, operating simultaneously, and by stack cutting in which steel plates are piled, clamped and then cut in one operation, large lots of accurately cut parts can be produced at great speed.

The recently developed automatic welding method known as Unionmelt offers remarkable speed for joining machinery frames, sections and other machine parts. For example, a portable unit can make finished welds in steel plate up to 1½-inch thick in only one pass at a rate of 7 to 8 inches per minute. The process uses heat generated by the passage of an electric current from a welding rod to the work being welded. The welding action takes place beneath a layer of highly resistant and conductive material, known as Unionmelt, without open arc, flash, spatter or smoke. Welds made under this protective layer and allowed to solidify while still protected possess unusual strength, ductility, uniformity and density. Operation is completely automatic. The welding operator merely pushes buttons and adjusts controls to start, maintain and stop the welding. The fact that the operator does not need special welding qualifications should prove of particular importance in a period when increased production cannot wait upon operator training.

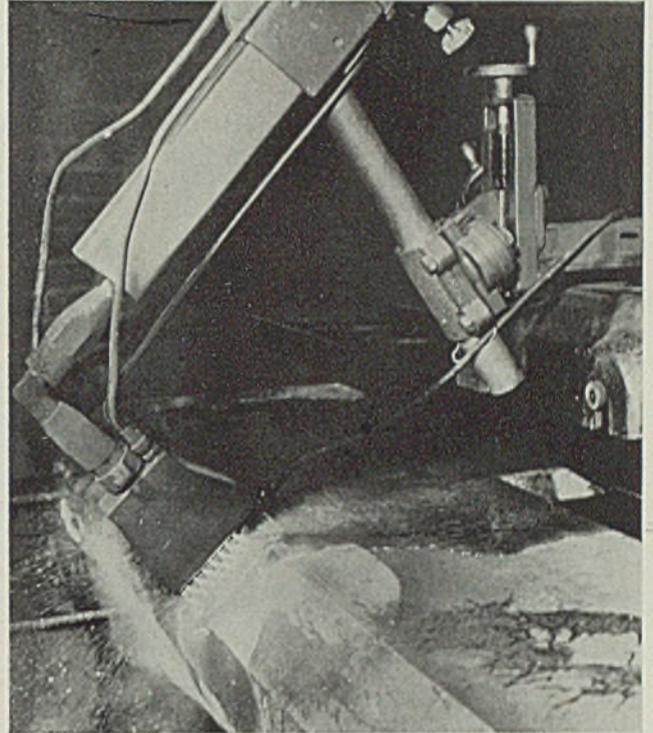
The oxyacetylene process can be turned to other uses in addition to machine cutting for the produc-



Automatic electric welding by the Unionmelt method produces good welds at high speed. Here is a butt-weld on 9/16-inch plate. Note excellent appearance of weld at right

Left, flame hardening imparts a highly wear-resistant surface to such machine parts as this hydraulic press guide

tion of improved machine tools. Special flame hardening heads are readily available for the selective hardening of many wearing surfaces such as machine ways on lathes, planers and milling machines; gear teeth, valves, bearings, cranks and crank shafts, roller tracks and caster races. Heat treatment consists of raising such surfaces to above their critical temperature by means of oxyacetylene flames, following with a suitable quench. Surface hardness can be raised considerably without altering the chemical composi-



tion of the metal and without affecting the toughness and ductility of the core. The economy and convenience of this method of heat treating only the areas subject to wear is evident. The process is readily used in connection with machine cutting since the cutting machine carriage, when not in use for cutting, can be used to motivate the flame hardening head.

Electric Eye Traces Solvent Vapors in Air

■ A hyper-sensitive electric eye which measures minute traces of solvent vapors in air—as low as one part in a million—was described to the American Chemical society recently by V. F. Hanson, physicist, E. I. du Pont de Nemours & Co., Wilmington, Del. The instrument is so acute that it can determine the presence of two drops of solvent in just an average size room.

It was designed primarily to determine the amount of solvents in the air around equipment used for dry-cleaning, metal degreasing and in chemical manufacturing plants.

The "ultra-violet photometer," as the machine was called, employs photoelectric cells to measure the opacity of the vapors. When explored by ultra-violet light, of short wave length, they cast shadows on a fluorescent screen, permitting accurate appraisal of their density. The device is capable of making

two to three determinations a minute, is portable and can be handled readily by a non-technical operator.

New Color Blindness Test Compiled

■ New color blindness tests have been compiled by United States military authorities, thereby making this country independent of Germany and Japan, principal sources of previous color perception tests, according to American Optical Co., Southbridge, Mass. The new tests will replace as a national standard in this country the Japanese Ishihara test and the Stilling system of Germany. The new compilation, which will be distributed by the optical concern, incorporates the best of both tests and adds features leading to the detection of those persons who do not wish to pass a color blindness test and also those attempting to hide their weakness.

Tests consist of 46 printed diagrams and a handbook of instructions. The diagrams or charts are

composed of patterns (figures, letters, etc.) made up of variously shaded dots of the primary colors set on a differently colored background of similar dots in confusion colors. While figures are easily seen by a normal person, the color-blind individual, unable to differentiate colors, cannot distinguish the figures from the background. In mild forms color blindness, hesitancy in naming the figures reveals the weakness. The plates provide for the detection of each type of color blindness.

Pamphlet on Pipe Nipples Now Available

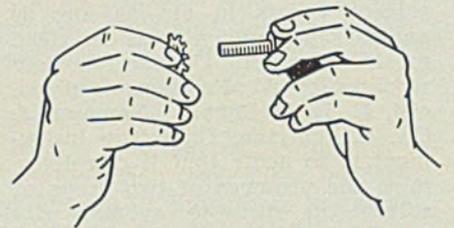
■ National bureau of standards, Washington, announces the availability of a pamphlet entitled "Pipe Nipples; Brass, Copper, Steel and Wrought-Iron," commercial standard CS540. This standard was accepted by the industry as its standard practice for production in May of this year. Copies may be obtained for 5 cents at the government printing office.

ASSEMBLY REC

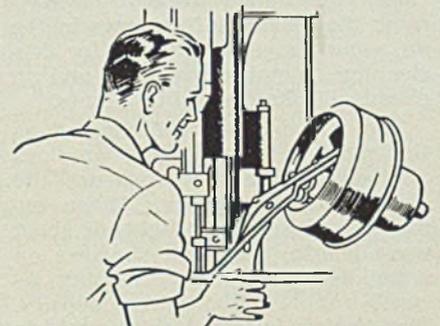
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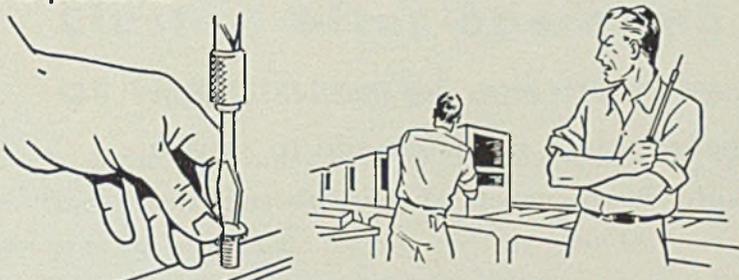
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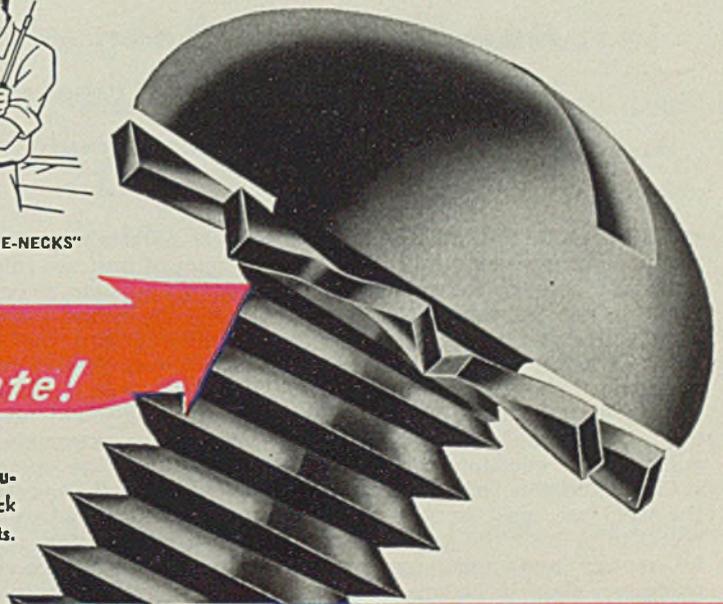


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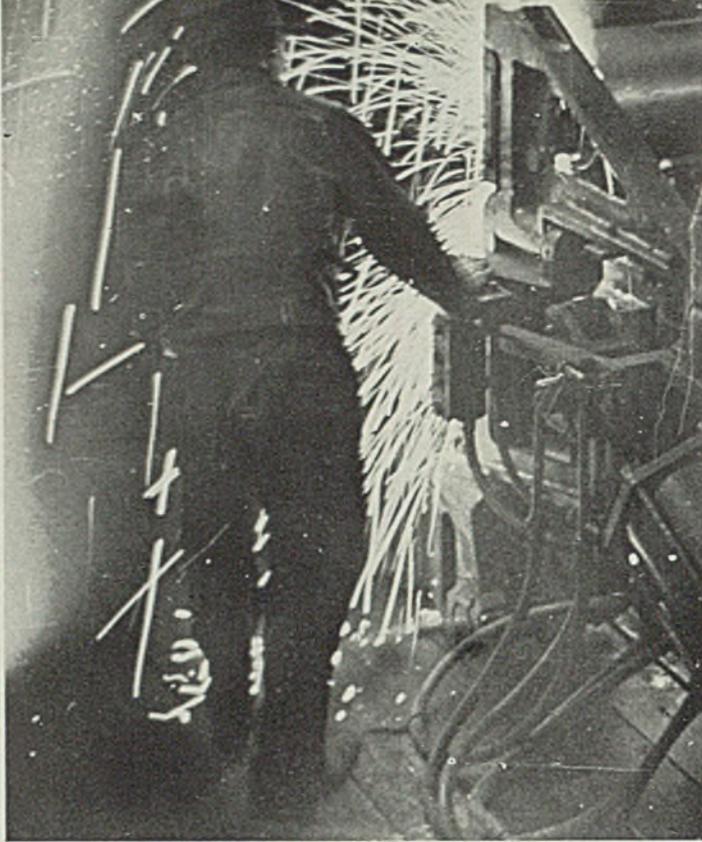


Fig. 1—Burning off excess metal during flashing period. Operator is outlined against shower of sparks

Welding Fabrications For Porcelain Enamel Finishes

Enameling welded fabrications proves entirely feasible, even on hot water tanks where expansion and corrosion add to service problems. Flash welding found most practical joining method

■ CONTRARY to the belief held by many, successful application of porcelain enamel to welded structures is not impossible—in fact, a number of companies have been doing it with considerable success for some time. However, there are a few important principles which must be followed carefully or difficulty will be encountered.

Characteristics of the metal in the weld are most important. The metal in or near the weld must not be spongy and must not contain oxide or slag inclusions as these will give rise to blisters and copper heads when the enamel coat is fused to the steel surface.

The welding method not only determines largely the character of the metal in and near the weld itself but also enters into the enameling operation in another way.

All types of fabricated structures

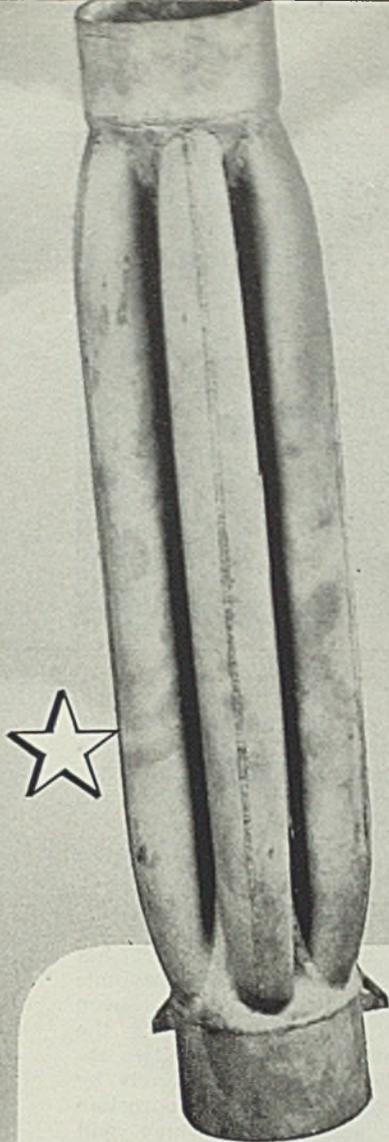
to be porcelain enameled should have metal of uniform thickness throughout all portions to be coated. Otherwise the heavy sections will be underfired when the enamel coat is fused and the thinner sections will be overfired, resulting in a poor enameling job. This means that lap joints are extremely undesirable as of course the metal thickness is doubled at the overlap. Not only is this true but where the metals lap, a crack exists into which it is almost impossible to force enamel—a factor which means poor enameling results if attempted.

These factors dictate the use of butt welded joints throughout the structure.

Such butt welded joints can be made economically and satisfactorily by gas welding where volume of work is comparatively small. Enameling over metallic arc welds does not

yet appear practical, according to several authorities. Carbon arc welding of flanged joints using no filler metal may be satisfactory. Where a considerable volume of production is to be handled, however, a flash welder will usually return sufficient savings from increased output and fewer rejects to warrant its sometimes high original cost, since most such machines must be designed and built especially for the particular work at hand.

Flash welding and use of butt welds largely eliminates the problem of oxide and slag inclusions as the flash-welding operation can be so adjusted that the upset portion of the cycle squeezes out all unsound metal leaving only weld metal of extremely high quality. By following this with a suitable trimming off of excess material squeezed out at each side of the weld, a surface



$$\frac{5000}{500} = 10$$



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Republic **ENDURO** Heat-Resisting Steel in United Air Lines Air Preheater Cluster, after operating **10 TIMES AS LONG** as the material previously used, is still in service!

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Literature giving complete technical information on the various grades of Republic ENDURO Stainless and Heat-Resisting Steels will be sent on request. Write Republic Steel Corporation, Alloy Steel Division, Massillon, O.; General Offices, Cleveland, O.

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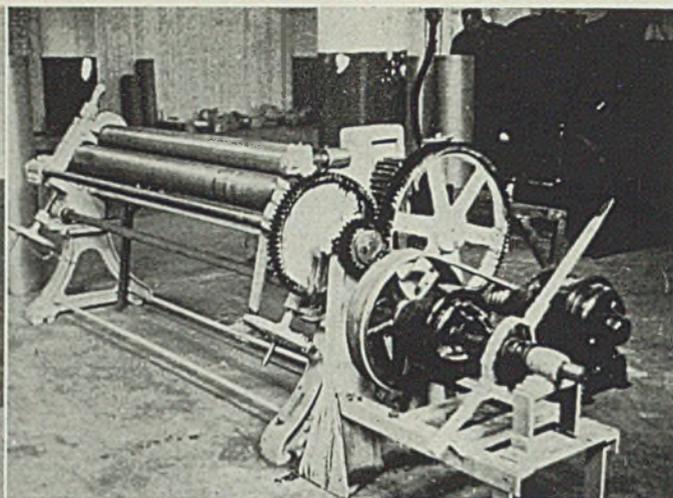
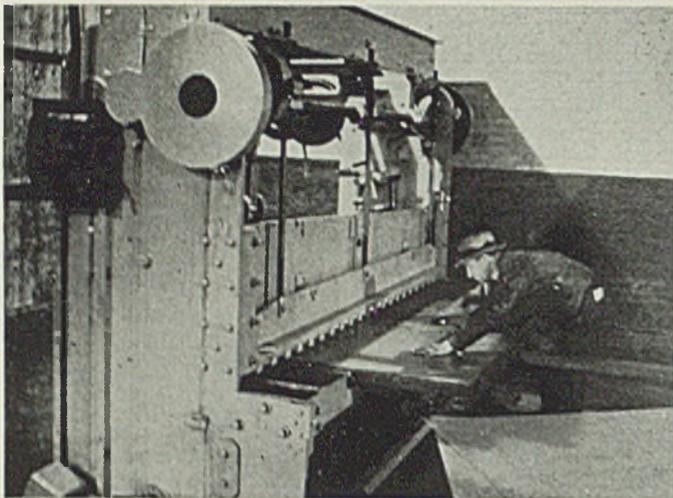


Fig. 2. (Left)—Large shear with hold-downs and stops for cutting sheet accurately

Fig. 3. (Right)—These powered rolls shape the sheet into a tube

can be produced so nearly like the base metal itself that it is extremely difficult to locate the welded joint after enameling.

Such flash welding not only gives the high quality joint required for enameling but does not thicken the section at the joint as the weld can be trimmed to same thickness as metal at each side. This assures uniform firing of the enamel coat.

Another important factor in designing welding fabrications for porcelain enamel finishes is to be sure the design does not include projections or corners from which the enamel cannot be drained properly.

Round Corners Essential

Rounding of edges is also important. If a sheet is sheared square and the sharp corners of the sheared edge allowed to remain on the fabrication when enameled, it will be found that the enamel on and within a fraction of an inch of these corners has become oxidized excessively or "burned" due to excessive heating at those points, which of course will reach a higher temperature upon firing than the body of the metal. Thus rounded corners are essential.

The principle of avoiding heavy and thin sections in the same piece is particularly important in attaching fittings, supports and other items or in assembling complicated fabrications. For instance, suppose it is desired to reinforce a flat area of comparatively thin sheet by arc welding a section of angle iron to it. To avoid cracks it is necessary to make the arc weld continuous around the entire area where one side of the angle contacts the sheet. This involves an excessive amount of welding and in addition does not give the uniform section desired.

A better method would be to use a flat bar and weld it on edge against the sheet. This would give approximately the same strength of rein-

forcement, would require the same amount of welding and would afford minimum added mass where the reinforcement is fastened to the sheet.

Of course it is desirable to grind all carbon arc or gas welds to get the smooth surface necessary to produce a good porcelain enameled finish.

Likewise it is essential that the enamel and the enameling procedure be correct for the type of work at hand.

An excellent example of the successful use of the above principles is the recent development of hot-water tanks, porcelain enameled both on the inside and outside. A high-production setup especially designed to manufacture these tanks at the rate of 3500 weekly, employing a single 8-hour shift has been completed recently at Porcelain Steels Inc., Cedar and Ashland roads, Cleveland. While standard sizes range from 30 to 52 gallons, the plant is equipped to make any size from 20 to 120 gallons on a production basis. Any diameter, 12 inches or larger, can be accommodated.

The field for water tanks, porcelain enameled both inside and out, appears to be extremely large because many such tanks are used in areas where waters of abnormal oxygen content, alkalinity or acidity are encountered which greatly shorten the life of ordinary galvanized steel tanks. Up to the advent of the porcelain enameled tank, most hot water tanks were made of steel with a hot-dipped zinc coating. Where deterioration of the galvanized tanks proceeded at an excessive rate, a few were made from monel and copper. The increased acceptance and present widespread use of porcelain

enameled refrigerators, ranges, roasters, washing machines and sinks naturally have led the way to use of porcelain enameled water tanks and it is expected this will be a rapidly expanding field.

Most hot water tanks fail because the steel rusts through from insufficient protection by the galvanized lining; or the tank may not produce an adequate supply of hot water efficiently because insoluble minerals from the water have been desposited on the surface of the tank. Both of these difficulties appear to be overcome effectively by use of the open-ended porcelain enameled water tank which will be described here. Porcelain enamel, being immune to chemical attack by the water, has a theoretical life expectancy of at least 25 years. Application of a proper porcelain enamel coat should provide effective protection from rust indefinitely. Porcelain enamels are available which are not affected by alkalinity or acidity of the water nor by high oxygen content. Electrolysis difficulties also are eliminated since the porcelain is a non-conductor of electricity.

Cost Is Reduced

Cost factor also is most favorable. A 30-gallon monel metal hot water tank costs about five times as much as a standard galvanized tank, while cost of the porcelain enameled tank is about half that of a monel tank.

The tank design developed and used at Porcelain Steels has proved extremely satisfactory and is quite simple. A flat sheet is formed and rolled into a tube. The longitudinal seam is flash welded. Tank heads are formed with a flanged section which permits attaching to the cylindrical section. This eliminates welds at juncture of heads and body of the tank. Open ends of the tank body are flanged outward and have holes punched in them by means of which the heads are bolted to the

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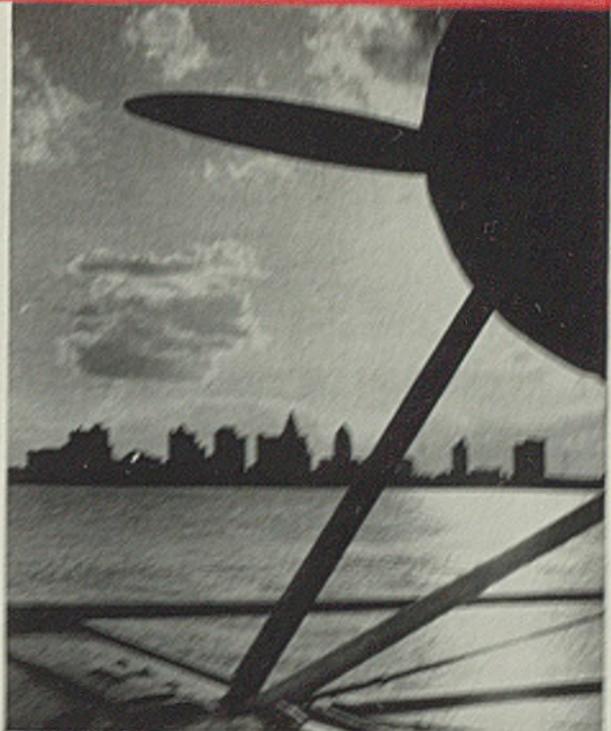
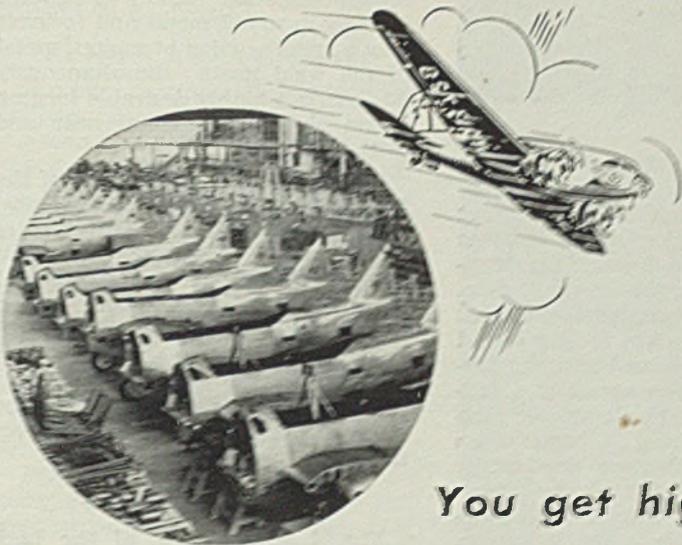


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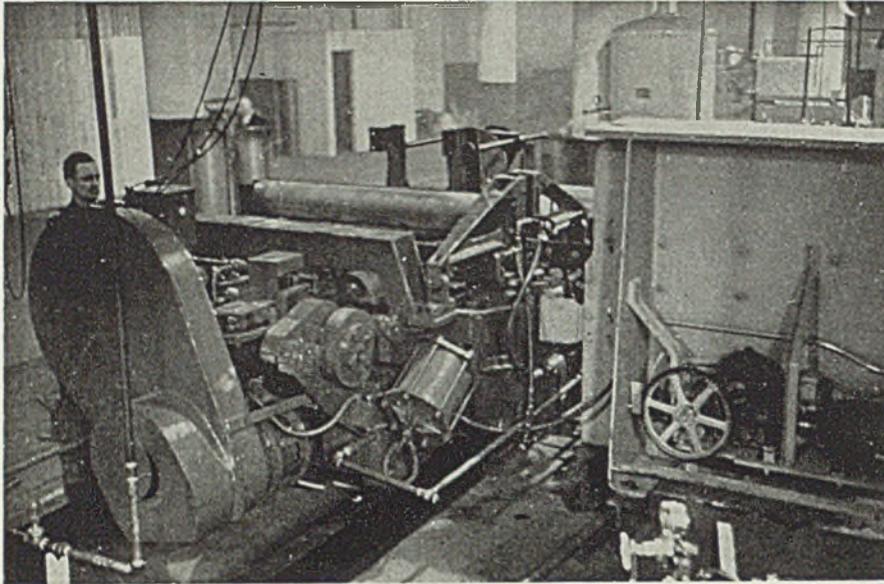


Fig. 4—Flash welder as viewed from right rear

tank to form the closed section. In use, most tanks are placed vertically. This permits the supporting stand to be removed easily, the detachable heads taken off and the tank cleaned with minimum effort.

All pipe connections to the tank are made by means of male spuds or nipples which are resistance welded to the outside surfaces of the tank sidewalls and to upper and lower heads.

Let's examine this design to see how the recommendations for successful enameling of a welded structure have been followed.

By flash welding the longitudinal seams, no foreign material remains in the weld and nearby metal is not fatigued or strained.

By use of a butt joint, the mass of the structure is not increased where the weld occurs, an aid to uniform firing.

By removing excess weld metal on a precision scarfing machine with carefully designed cutters, a smooth surface is produced both on the inside and the outside of the weld to which the porcelain enamel adheres faithfully.

By butt welding the pipe connections to the outside of the tank, no sections protrude inside to make draining difficult.

By using butt joints, there are no cracks or openings into which the enamel will not flow properly so all surfaces will be covered quite effectively.

By using nipples of as thin section as possible, excessive mass is avoided where they attach to the tank and underfiring at this point is prevented. Steel employed is Armco ingot iron, especially suitable for porcelain enameling. Not only are the tank body and heads of this material but also the nipples.

It is evident ample provision has

been made in the design for proper enameling.

Production setup for turning out 3500 of these tanks weekly includes a number of special machines developed for this particular application. All fabricating equipment is located in a 18,000-square-foot section leased in a modern reinforced concrete fire-proof building with access to a railroad siding and two trucking platforms. Fabricating is handled on one floor, finishing on another.

With the exception of the power shear shown in Fig. 2, all equipment is located in a single line in sequence. The large precision power-driven shear in Fig. 2 is located at one end of the manufacturing line opposite the power-driven rolls in Fig. 3 which are at the start of the production lineup. On the same side as the shear is an area for storage of sheet steel, work in process and completed units.

Power-driven shear, Fig. 2, is equipped with automatic holddowns and precision gaging devices so sheets can be cut to the accurate dimensions necessary for successful flash welding work. The shear is of ample size to handle material from 8 to 14 gage and in sheet sizes sufficient for 120-gallon tanks and larger. From the shear, the large sheets for tank bodies are transferred directly across the aisle to the power rolls shown in Fig. 3. Here the sheet is formed into a cylinder ready to go to the flash welder.

The flash welder is a huge machine specially designed and built for this job by Federal Machine & Welder Co., Warren, O. The 60-inch longitudinal seam in a standard 30-gallon hot water tank is completed in this machine in 9 seconds. Power demand in making the weld is from 500 to 700 kilovolt-amperes during the flashing period. This demand increases to about 1200 kilo-

volt-amperes on upset. Nearly $\frac{3}{8}$ -inch of metal is burned off on each side of the weld during the flashing period.

Amount of upset is $\frac{1}{4}$ -inch. This means that after the $\frac{3}{8}$ -inch has been burned off on each side of the weld, during the flashing period when the metal is being fed into the joint at a rather slow rate, the feed rate is increased, causing the power demand to rise to a maximum of 1200 kilovolt-amperes. At this point, the current is cut off and the sides of the joint continue to be brought together rapidly to squeeze out any unsound metal and to leave only a small portion of molten metal in the weld itself. Simultaneously this exerts a highly desirable forging action on the hot metal near and in the weld.

Fig. 1 shows an action view of the flash welder from the control side. Note all controls are conveniently within reach. This is the side from which the work is placed into and removed from the flash welder. Part of the fixture hinges to fold down away from the end next to the operator so the completed tubular tank body can be removed from the machine. A special ejector removes the work from the machine.

Special-Built Ejector

Fig. 4 shows view of the back side of the flash welder. The complicated drives, air clamping cylinders and auxiliary equipment are evident in this view. The special structural steel section at the extreme right in Fig. 4 is part of the ejector mechanism which pushes the completed tank body from the welding dies. A closeup view of this same ejector mechanism taken from the opposite side is shown in Fig. 5.

The ejector was specially built for this application. At extreme right in Fig. 4 will be seen a motor, worm gear and spur gear reducer mounted in the lower section of this frame. The shaft driven by this set of reducing gears extends through to the opposite side of the frame and is connected to the crank disk seen at lower center in Fig. 5. To eject a welded tank body, the motor is actuated which in turn revolves this crank disk. A series of levers is connected to this crank disk to give the desired ejecting stroke at the welder die which is in line with the upper bar of the ejector mechanism, Fig. 5.

This power ejector is important in obtaining maximum production from the welder as it eliminates the difficulty in removing the tank body which "hugs" the dies upon com-

pletion of the welding operation. Welding dies are operated by compressed-air cylinders. Welding machine itself weighs 33,700 pounds.

Power for the welder is furnished by two transformers connected in parallel and mounted in a transformer vault immediately below the welding machine.

Next in the line of equipment is an air compressor driven by a 30-horsepower motor with a capacity of 150 cubic feet per minute of air which is fed to an accumulator or ballast tank of 250 gallons capacity. Pressure of 90 to 100 pounds per square inch is maintained. Air is utilized in the flash welding machine and in much other equipment which will be detailed.

Excessive Metal Cleaned Off

Next production unit is the weld stripper or scarfer shown in Fig. 6. As soon as a tank body comes from the flash welder with the longitudinal seam completed, it is placed over the dies of the stripper. Fig. 6 shows a tank body partly inserted in the dies. When in position, pneumatic cylinders clamp the work securely and a set of cutter heads are traversed the length of the weld both inside and out to clean off excess weld metal extruded during the upset portion of the flash-welding cycle.

Fig. 7 is closeup view of the cutters. Note that the cutters are carried on retractable arms which slide in the dies holding the work securely in position. Lower slide carries two cutter teeth which traverse the interior surface of the tank body. A third cutter simultaneously traverses the outside surface of the weld maintaining a position midway between the two lower cutters as it moves. This permits required pressure to be exerted on the cutting tools without "jamming." Cutters, of course, are shaped to produce exact spherical contour of the interior and exterior tank surfaces, and cut the weld metal right down to the base metal itself so the trimmed weld is no thicker than the adjoining base metal. Cutter tools are carefully maintained to produce smooth clean-cut surfaces.

Next machine in line is the spud welder, Fig. 8. This is a special machine to weld the threaded male pipe fittings, called spuds, to the

outside of the tank bodies and heads. Ordinarily 5 spuds are welded to each hot water tank—two at the top, one at the bottom and two on the side near top and bottom. These afford inlets and outlets as well as

connections for the thermostat which is mounted alongside the tank. Spuds themselves are made from Armeo ingot iron.

The spud welder is air operated by means of the foot control seen in

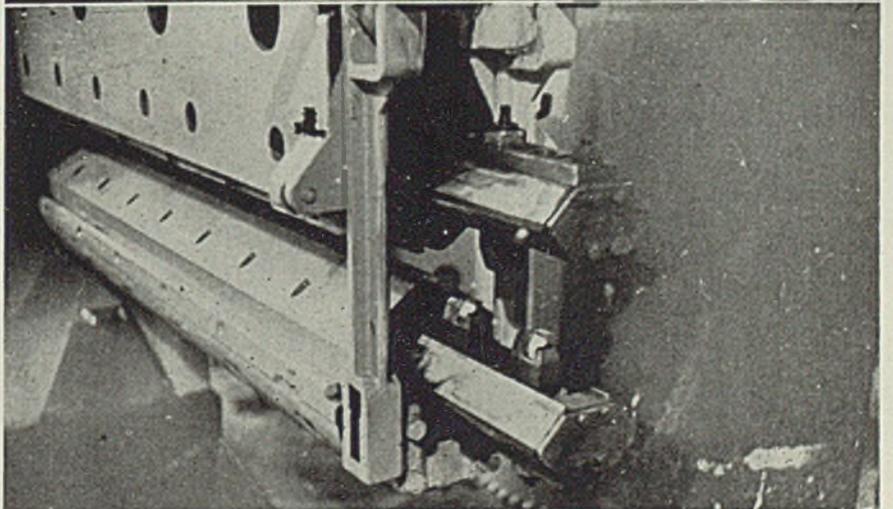
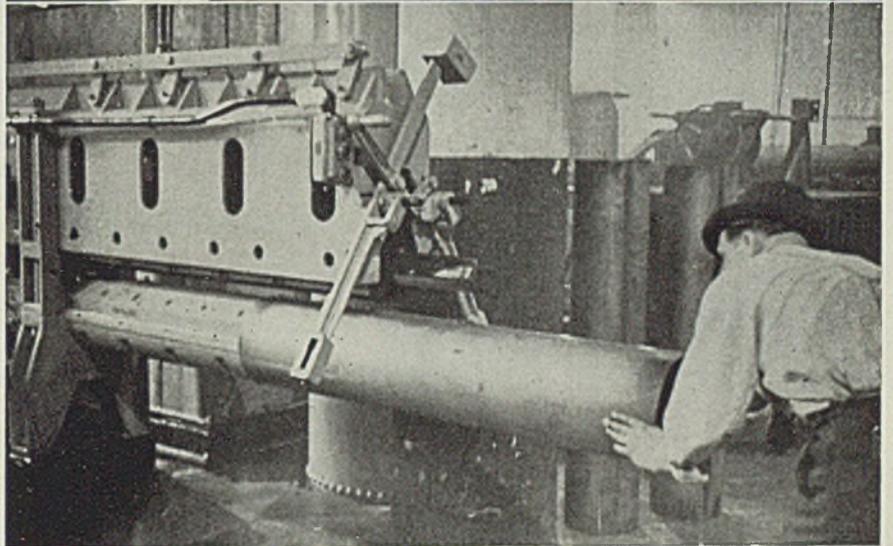
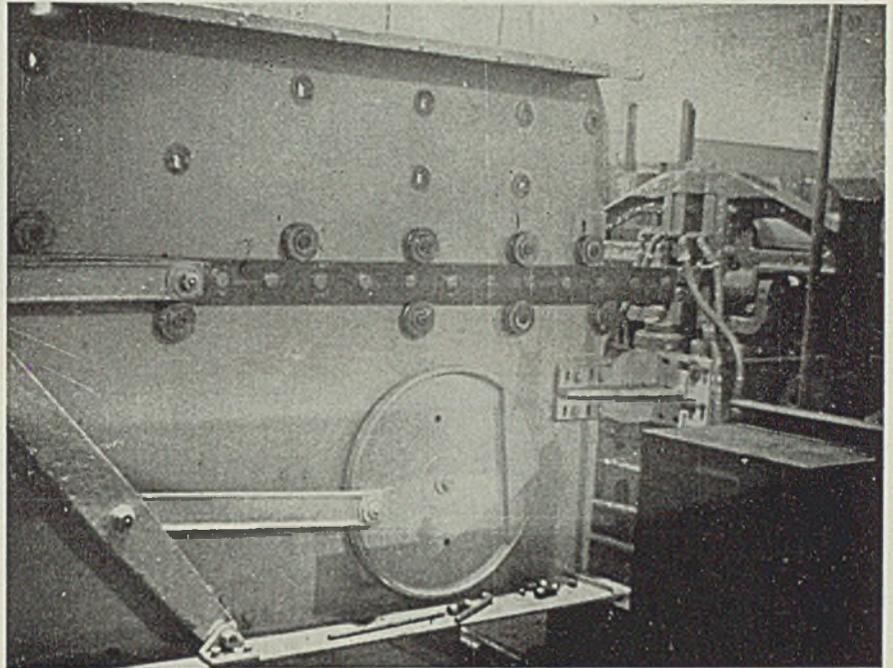
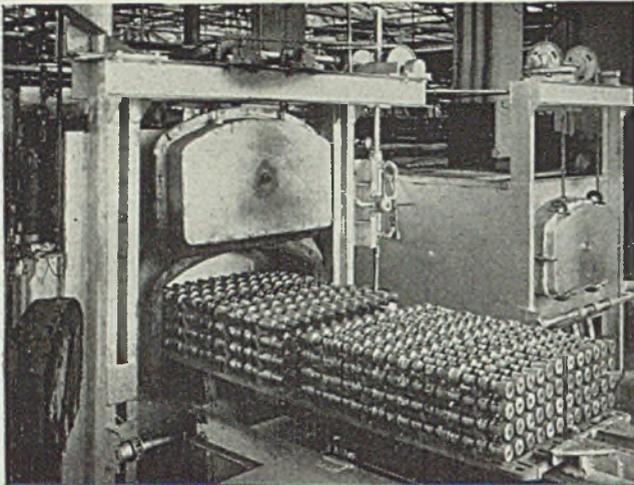


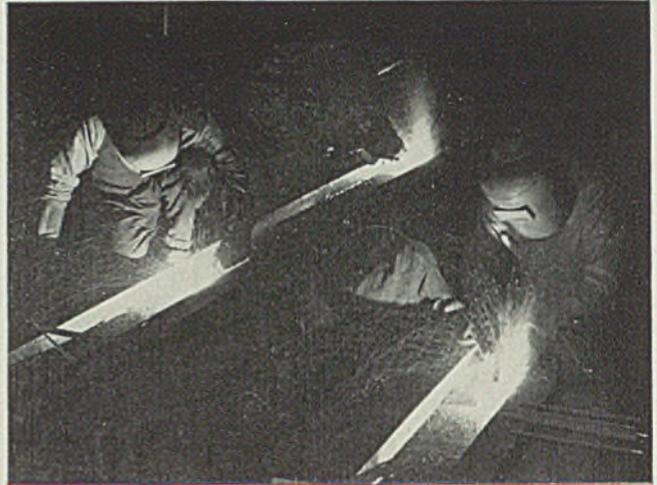
Fig. 5—Portions of ejector mechanism which strips welded tank body from dies

Fig. 6—Inserting a tank body into the stripper

Fig. 7—Two teeth on lower cutter and one above clean off excess metal from weld on tank body. Stripper here is empty to show cutters and mechanism



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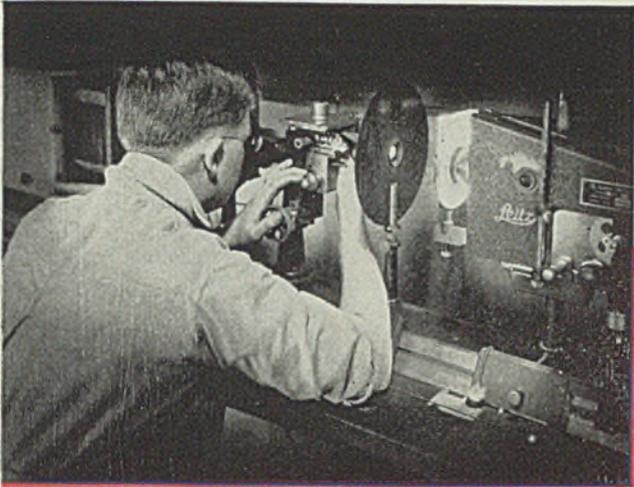
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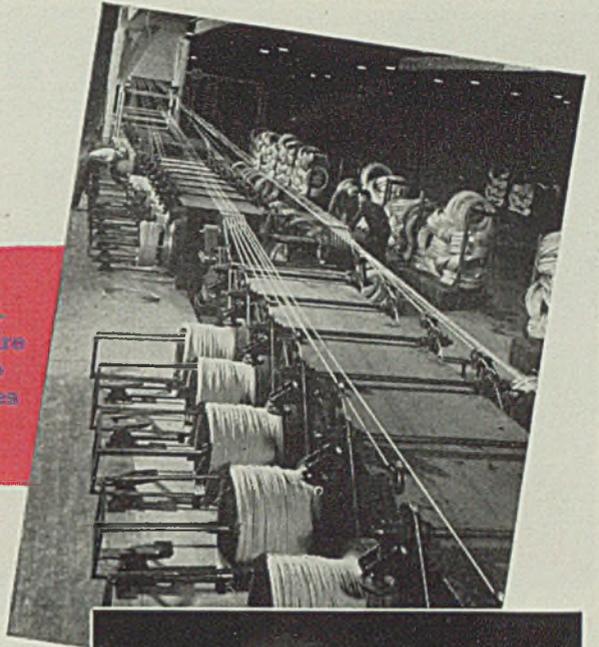
Metal Show Issue

OCTOBER 14, 1940



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■ The latest methods, materials, equipment and metals will be on display when the twenty-second National Metal Congress and Exposition is in session at the Public Auditorium, Cleveland, Oct. 21 through 25. The papers presented at the business sessions will reflect the best thinking and most exhaustive research done over the past year. This is truly the "metal man's" greatest opportunity for an interchange of ideas and to learn of the latest developments.

Following its usual custom, STEEL will devote a large part of the October 14 issue to the same interests as the various societies participating in the National Metal Congress. This issue, dated just a week prior to the opening of the show, will carry complete advance details so that you can lay your plans as to the papers you wish to hear, the things you wish to see and the booths you would like to visit.

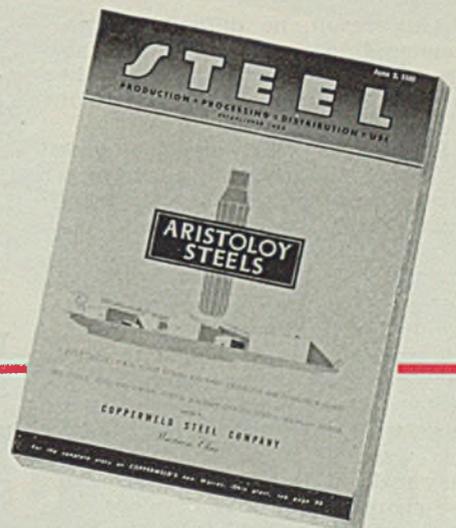
Our October 14 issue will contain a combined advertising and editorial insert section printed in two colors on special coated stock. This insert section will carry the complete program and list of exhibitors. In addition, it will feature pertinent comments by men known and respected throughout the industry. It will have a profusely illustrated section depicting the progress and achievements of the past year.

The advertising pages will inform you of the newest money saving equipment; of better methods; of improved materials and metals. If you attend the show, STEEL'S October 14 issue will help you to profitably plan your time. If you can't attend, this issue will bring the show to you.

Companies supplying equipment, materials, methods or metals are invited to write for information relative to advertising possibilities.



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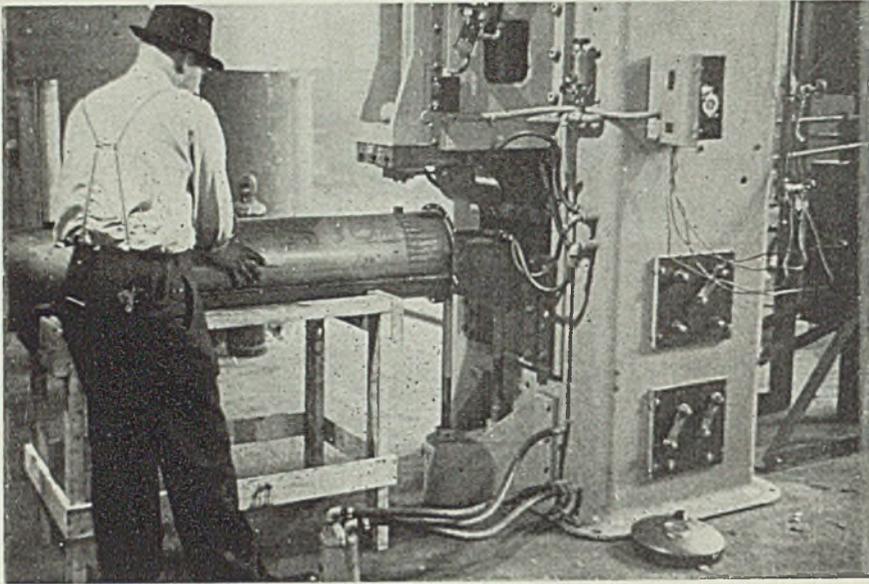


Fig. 8—Spud welder which fastens threaded male outlets to tank body

Fig. 8. In this view a spud is being welded on the side of a tank body.

Closeup view, Fig. 8, shows the lower die or electrode which has a raised ring on its face the same diameter as the spud to be welded. This concentrates the current on the inside tank surface directly opposite the spud on the outside. Spud is carefully lined up with lower die by means of close-fitting upper die. Once the spud is located, welding is performed by tripping the foot switch. Passage of current through the weld for 1/5-second produces complete fusion of the spud and tank wall.

Subsequently excess stock is removed. The complete fusion leaves no crack between spud and tank wall. Interior corner of the tank opening is rounded off so enamel will not overoxidize during firing due to the sharp corner which otherwise would exist.

Enameling Practice Varies

As a result, no difficulty is encountered in producing a satisfactory porcelain enamel job near the interior and exterior openings for the spud connections.

Subsequently the completed tank is tested hydrostatically under a pressure of 300 to 800 pounds per square inch, depending upon the service conditions for which it is designed. Rejections are few.

Enameling practice, while differing little from conventional methods, merits a word. While all ordinary porcelain enamels may be expected to have a satisfactory life in most waters, slightly acid or alkaline water in a particular district may make it desirable to use one of the enamels especially developed to show maximum resistance to that

water. The tendency to reboil or copper head may be minimized by proper selection of the ground coat. Also, a ground coat designed with a fairly wide burning range may be found advantageous.

An enamel especially developed by Ferro Enamel Corp., Cleveland, has exceptionally high resistance to deterioration. This universally resistant enamel is used on all the tanks. This enamel is more flexible than other types as expansion and contraction emphasize the importance of this factor. It is fired twice at 1600 degrees Fahr. in a large continuous furnace.

Porcelain enameling of tanks produced at Porcelain Steels Inc. is handled by the Co-operative Enameling Co., Cleveland. Upon receipt there, tanks are pickled and given a 2-coat enamel by orthodox enameling methods. Outside surfaces are sprayed and inside surfaces are dipped or slushed. Carefully designed burning tools permit fusing the coats to the tank without warpage developing.

A sensitive electrolytic test indicates bare spots no longer than a pin point. This test is so sensitive that it can be adjusted to indicate thin spots, too. Amount of reworked pieces is kept surprisingly low.

There is no reason why the successful principles outlined above cannot be applied to other steel fabrications for porcelain enameling both inside and out.

Issues Specifications For Welding Electrodes

■ American Welding society, 33 West Thirty-ninth street, New York, and American Society for Testing Materials, 260 South Broad street, Philadelphia, have issued jointly a

7-page booklet, "Tentative Specifications for Iron and Steel Arc-Welding Electrodes," covering coated and covered electrodes for welding of carbon and low alloy steels of weldable quality. It classifies the electrodes on the basis of usability and the ultimate tensile strength all-weld-metal specimens in the stress-relieved condition.

Some of the subjects discussed include manufacture, sizes, chemical composition and analysis, permissible variations in dimensions and finish.

Arc Welding Lessons For Practical Training

■ *Lessons in Arc Welding*, 144 pages, 6 x 9 inches; over 100 illustrations; semiflexible simulated leather; published by Lincoln Electric Co., Cleveland, for 50 cents in United States, 75 cents elsewhere.

Helpful to beginners and experienced welders desiring comprehensive practical information this work is also of value to welding officials, such as supervisors, foremen and instructors desiring a ready reference to fundamental information on arc welding and a guide to its proper application.

It is a series of 51 lessons based on experience of Arthur Madson, instructor in the Lincoln arc welding school, presenting concisely the fundamental facts of welding, enabling the welder to utilize the process successfully and economically.

The lessons are in four sections, covering welding with unshielded arc electrodes, with shielded arc electrodes, electrodes for particular joints and hardfacing. The first section contains 19 lessons, the second 9, the third 15 and the fourth 8 lessons. All go into much detail and cover all phases of the various divisions.

The text is supplemented by line drawings and halftones for ready understanding. Questions are provided for each lesson, enabling the student to check his knowledge.

New V-Belt Prevents Static Charges

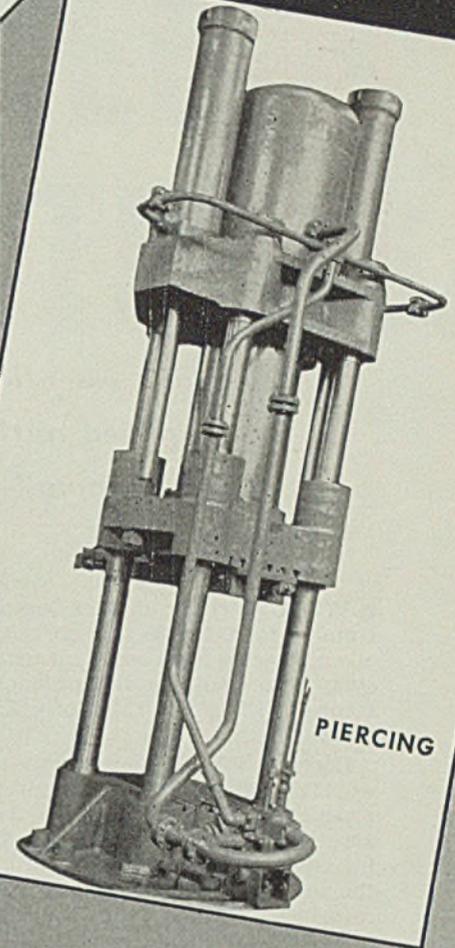
■ What is believed to be the first V-belt manufactured which prevents accumulation of static and retains its static-discharging qualities during its entire service life is announced by B. F. Goodrich Co., Akron, O. It is at present being offered only to machine or equipment makers.

One of the important features of the new belt is the absence of any danger of the belt acting as a short between the motor and its operator. The resistance built into the belt is just enough so that the belt itself cannot act as a direct passage for current.

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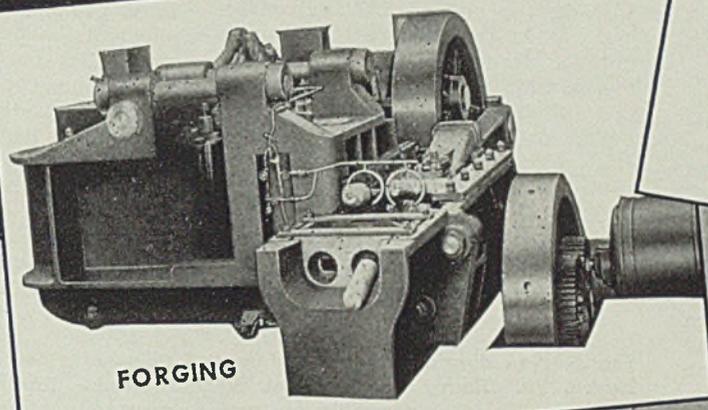
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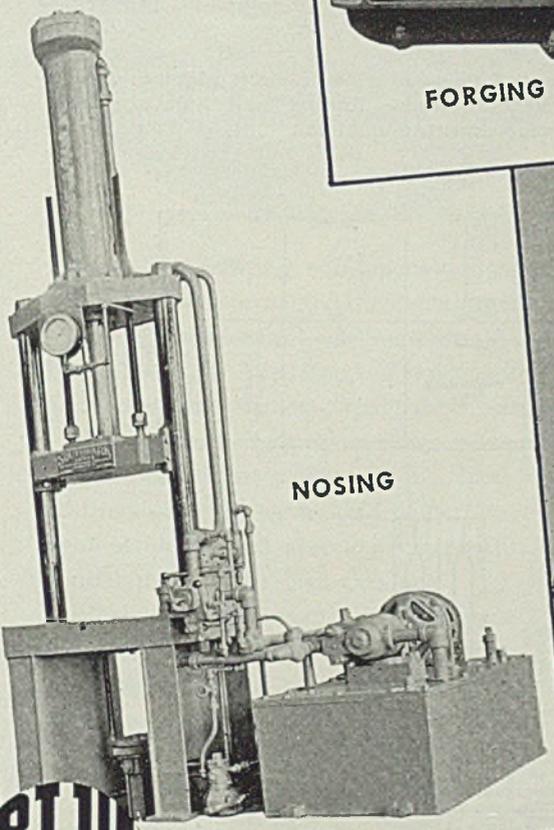
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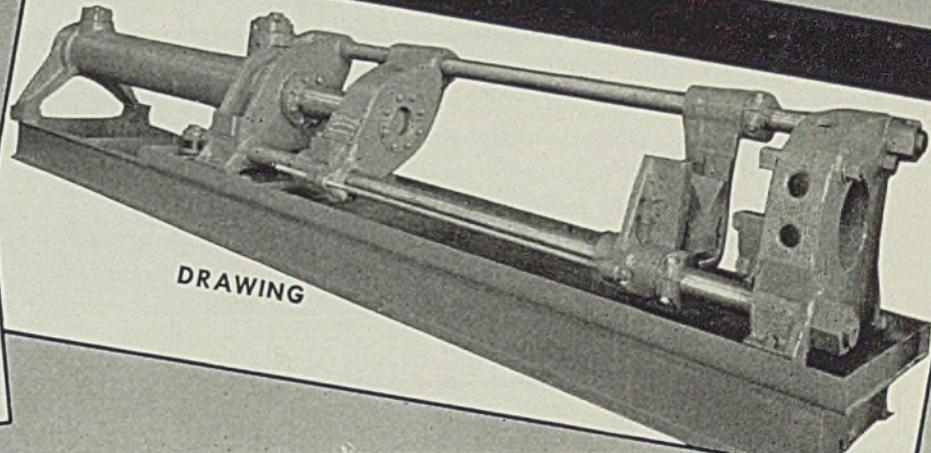


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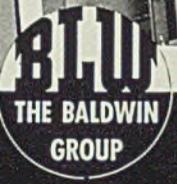
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While essentially a series of hand processes, these have been simplified until a ship is turned out here every 2 hours. A 4000-foot monorail system facilitates straight-line movement of parts

■ WITH yearly production jumping from 23 to 70 to 735 to place where one completed airplane is turned out every two hours is the production record of Piper Aircraft Corp., Lock Haven, Pa.

Early in 1939 this plant set a new world record for nonmilitary aircraft production each month. In January, 1939, there was a 10 per cent increase over the same month of the year before, in February a 51 per cent increase, in April a 73 per cent increase and a Cub airplane rolling out of the doors every two hours. Soon production for each month more than doubled that of the same month the previous year, and the 1000th 1939 Cub was made on Aug.

By ARTHUR S. PEIRCE

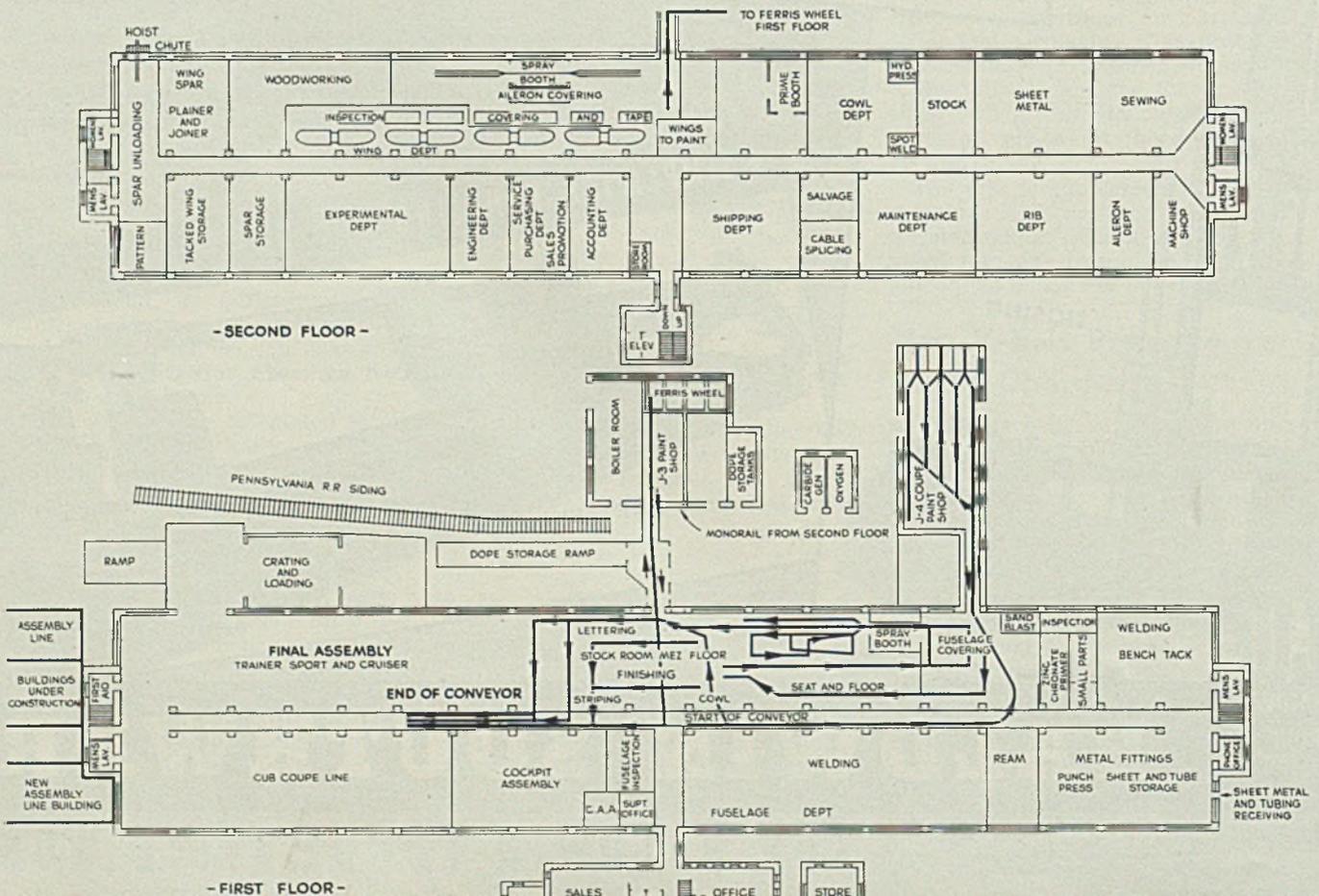
16. By the end of 1939 deliveries had passed the 1800-mark, accounting for approximately half of all the nonmilitary airplanes made in the United States that year.

This little bit of history sets the stage for a picture of production in 1940. With a new stainless steel muffler to cut down motor noise without cutting down motor power or overheating the engine, and with a new 3-place cruiser available as

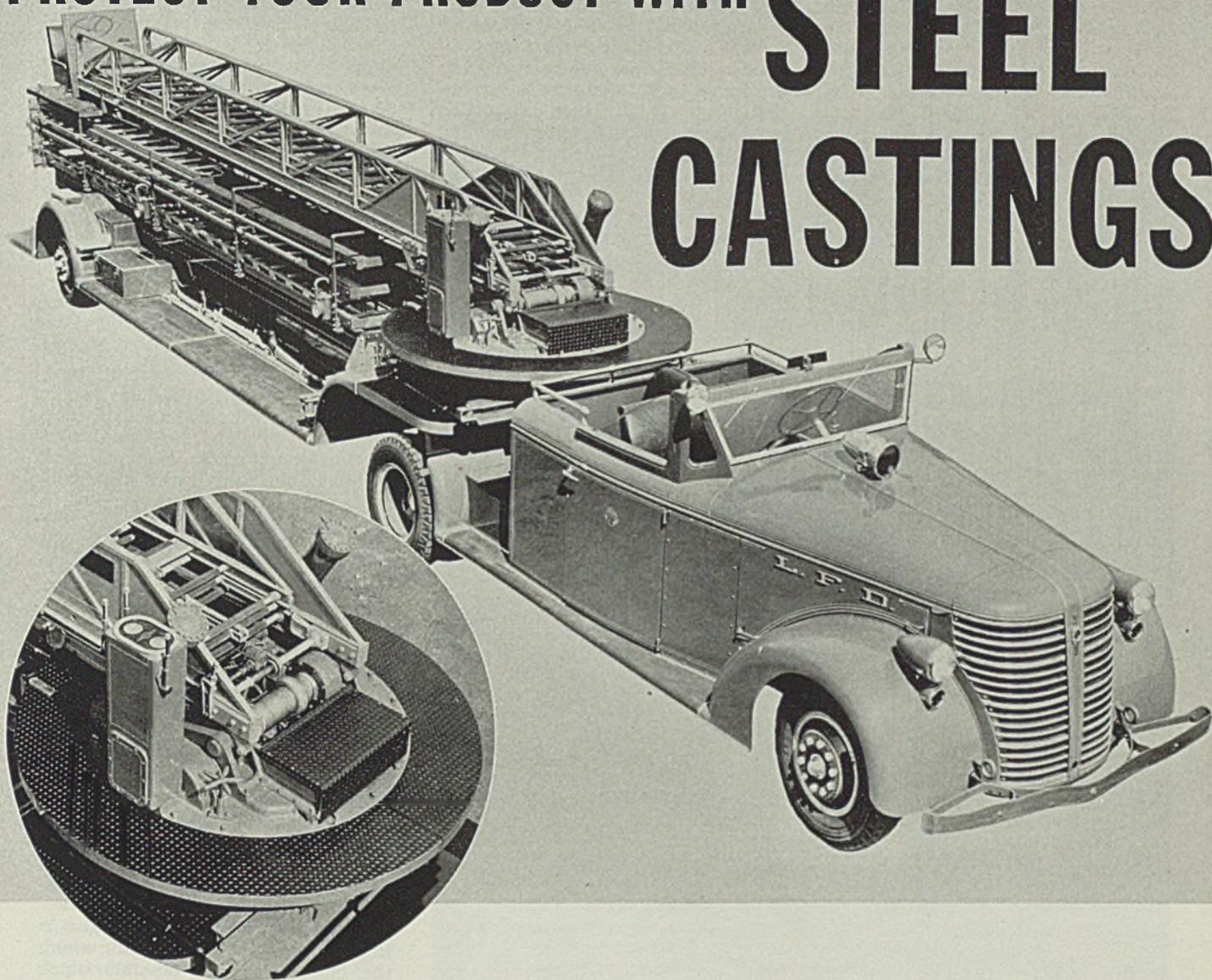
well as a 2-place tandem trainer, over a million dollars in orders piled up necessitating some step toward mass production. Previously many shortcuts in processes had been investigated, but commercial aircraft production still remains essentially a series of hand processes. However, these have been cut and simplified as much as possible, and a smooth straight-line movement of parts inaugurated.

Success of the mass production methods worked out here, however, is due largely to complete standard-

Fig. 1—Plan diagram of first and second floors of Piper Aircraft plant at Lock Haven, Pa. Heavy lines indicate monorail track. Several new buildings for assembly are under construction at left



PROTECT YOUR PRODUCT WITH **STEEL CASTINGS**



Modern fire-fighting equipment—efficient, streamlined, dependable—is protected through the generous use of steel castings for important working parts. All of the lift members of this new American LaFrance ladder truck are cast alloy steel—“for utmost strength and resistance to shocks.”

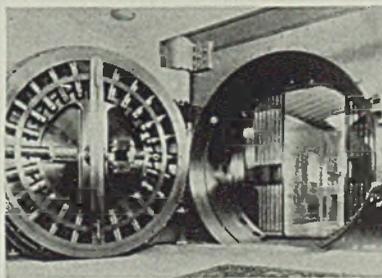
Here, where failure of any part might mean disaster or loss of life, steel castings give the same kind of permanent strength and stability they will contribute to your own product.

Steel castings have other advantages for you, too. They save on machining and assembly time, permit metal distribution for greatest strength exactly

where needed, afford a wide range of mechanical properties, and lower over-all weight.

Safety deposit vault doors and fittings, and thousands of other products, give better protection because an increasing number of steel castings are used to build them.

Consider steel castings for your product. They will bring you improved quality, plus increased strength and safety . . . often at lower cost. Consult your own foundry, or write to Steel Founders' Society, 920 Midland Bldg., Cleveland, Ohio, for further details and recommendations. No obligation.



MODERNIZE YOUR PRODUCT WITH

STEEL CASTINGS

ization. All Cubs are essentially and structurally identical. This first and important step, standardizing models, combined with production line manufacture it makes possible, gives this comparatively small plant a capacity of 5000 planes yearly.

Already 2500 planes are scheduled for 1940. While these planes are not the large complicated structures represented by planes for combat and bombing operations, the production of 5000 planes a year points to what can be done by simplifying and standardizing design and production. While this particular plant

and sequence of operations, arrangement of departments, etc., in no wise indicates the ideal arrangement, it does indicate what one company has been able to do along mass production lines. In any such production work, adequate mechanized handling facilities will be found just as important as they have proved to be here.

The first step toward mass production methods was installation of an overhead system of monorail in the early spring and summer of 1940. With this handling system, a fuselage is placed on a frame

slung from the monorail as soon as it is tack welded together. From that point it is pushed steadily along while welding is completed, covering put on, dope applied, polishing completed and work delivered to main assembly point—all with remarkable facility.

The monorail system has increased production speed about 15 per cent. At the same time, it has made an important decrease in worker fatigue—a valuable contribution in preventing accidents and assuring steady flow of work through the plant.

When a fire started in the dope shop of the original plant at Bradford, Pa., March, 1936, the whole factory burned down, including drawings and plans. Although production went on in miscellaneous buildings all over town, the company moved to Lock Haven, Pa., in July into a large reinforced concrete and glass building with two floors covering a ground area 100 x 500 feet. Here are provided facilities for "straight-line" production, not truly in a straight line as parts must loop back through dope shops from drying and polishing operations for the several layers which are applied.

Dope Shop Air Conditioned

A separate building, see layout diagram Fig. 1, for a dope shop provides fire protection and better air conditioning necessary for the health of workmen and for efficient doping. High ceilings make installation of massive machinery possible.

Location of the new plant also is important as a railroad siding along the building makes possible quick and efficient delivery of material in carload lots. Finished planes are delivered straight from final assembly line to freight car without transporting through town. At the foot of the ramp opening from final assembly floor, a space spreads out where finished planes may have minor adjustments made after a test flight. This space is about a block long, and planes can take off and land in flight to and from the nearby airport proper just beyond a row of houses at the end of the open block at the final assembly

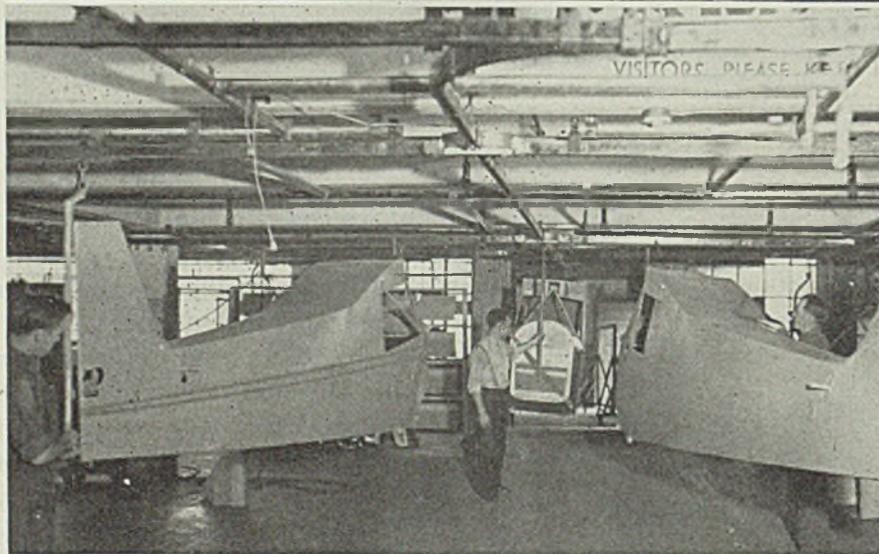
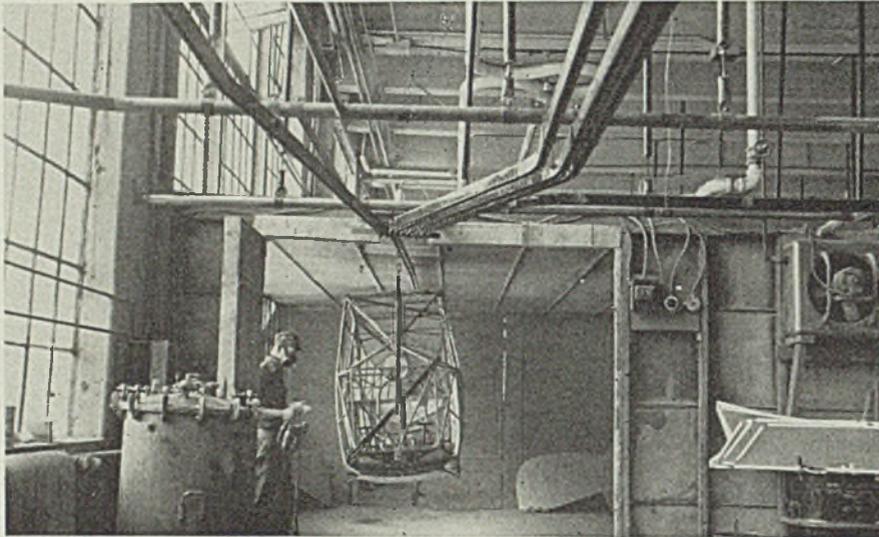


Fig. 2. (Top)—Tubular frames are sprayed with molten aluminum to form a protective coating against corrosion. Note five monorail lines going into spray booth

Fig. 3. (Center)—Double monorail lines here support fuselages from two points while stripes and numbers are painted on

Fig. 4. (Bottom)—Here in the second dope room, wings are being rubbed between coats while on monorail lines

door. A small row of hangars near the final assembly ramp accommodates 20 planes. The airport has a large glass and steel hangar accommodating 25 planes and a small private hangar for about 8 planes. A nearby seaplane base in the Susquehanna river also is available for testing, instruction, demonstration or for visitors.

Piper Cub models now include a 3-place cruiser, a 2-place coupe and a 2-place tandem trainer—all employing essentially the same structure. Ships in various stages of completion can be seen in accompanying illustrations. The coupe weighs 830 pounds on an average without gas, oil or pay load. Approximately 610 pounds of this empty weight is metal in form of steel tubing, nicral, aluminum, brass, copper and other metals comprising about 2500 parts. The trainer and cruiser models have about the same ratio of metal.

Production now is handled almost completely on monorail conveyor system as mentioned above, and at a 15 per cent increase in speed over the hand trundling system previously employed. The monorail system includes 3000 feet of overhead track with switches, sidings, crossovers and similar accessories. It carries fuselages from completion in the welding department through various processing operations to final assembly stage. It also provides facilities for carrying the wings from wing department through processing operations to final assembly floor.

Fig. 1 shows layout of plant and monorail handling system on the two floors. It will be noted that the wing department is on the second floor where the wings and smaller sections of the plane are constructed. Here also are located the experimental department, various storage de-

partments and a number of processing departments as noted in the diagram. From the short monorail section on which work is handled

through the spray booth, wings and miscellaneous parts are loaded on the monorail which travels down to
(Please turn to Page 83)

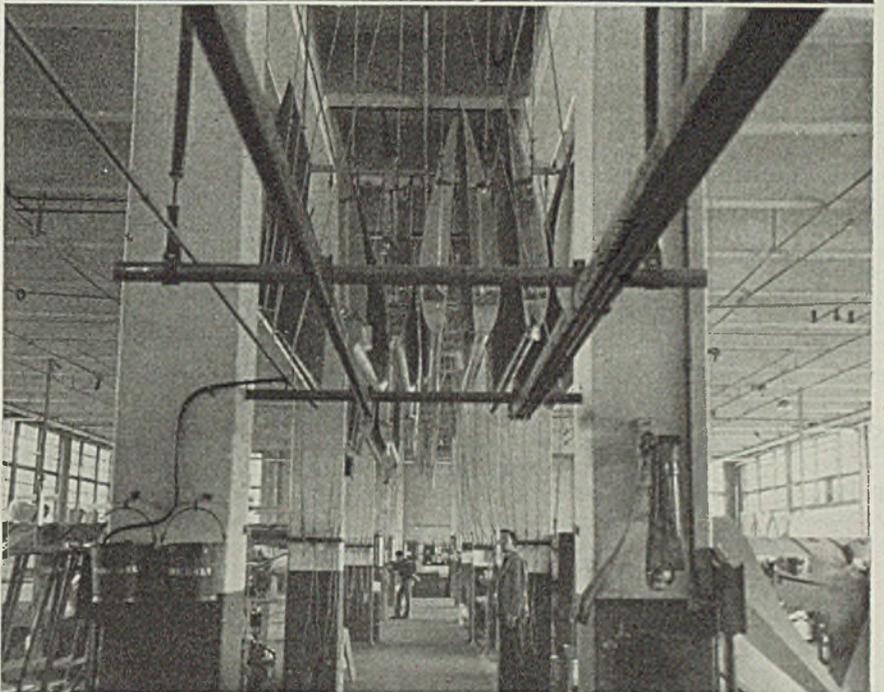


Fig. 5. (Top)—Main dope room where wings and fuselages are mounted on a huge "ferris wheel" which rotates them for drying between spraying and rubbing of successive coats

Fig. 6. (Center)—End of monorail conveyor where completed wings are suspended temporarily from the ceiling before installation on planes

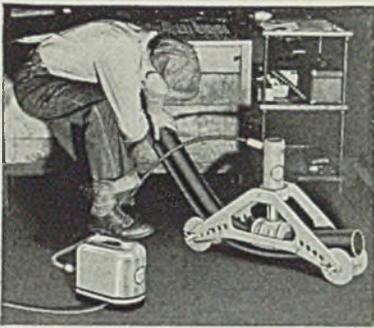
Fig. 7. (Bottom)—Final assembly, coupe line. Two assembly lines, one for coupes—the other for trainers, serve about 20 ships simultaneously. An addition now under construction will provide continuation of these lines so about 75 planes can be handled at one time. With 44,000 square feet in new addition, total floor area will be about 160,000 square feet. In final assembly, wings and tail surfaces are installed on fuselages, then motors, instruments and other parts. From final assembly, planes leave for test flights





Hydraulic Pump

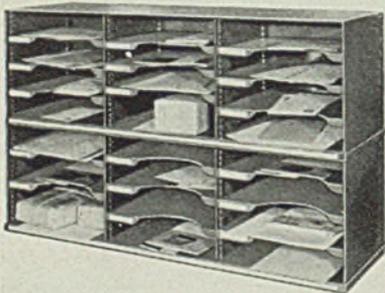
■ Blackhawk Mfg. Co., Milwaukee, announces a motor-driven hydraulic pump for use in conjunction with high-pressure oil hydraulics. Known



as Porto-Power model P-95, it weighs only 32 pounds and its built-in ½-horsepower motor generates 10,000 pounds hydraulic pressure per square inch. It can be connected by a high-pressure hose to any one of the hand-operated Porto-Power rams. The pump also can be equipped with a gage for testing or weighing in "tons total load" or "pounds per square inch" pressure.

Sorting Rack

■ Lyon Metal Products Inc., Aurora, Ill., has introduced a new steel sorting rack for use as a mail



sorter, order rack, tool storage, etc. It has a recessed bottom, which permits the racks to be securely stacked, as shown in the illustration. An added feature is the hand removable shelves which are adjustable every half inch. The rack is equipped

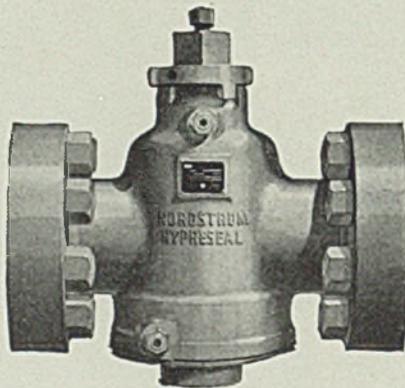
with nine 11 1/3-inch shelves and a base to form 12 compartments. Each removable shelf has a label-holder, ½ x 2½ inches. The base is fitted with a ½-inch label-holder which runs nearly the full width of the rack. Each rack is 34 1/3 inches wide by 11½ inches deep by 10¾ inches high and is of spot-welded construction.

Unit Heater

■ Young Radiator Co., Racine, Wis., announces a complete line of unit heaters for industrial buildings having high ceilings. This line includes 12 sizes varying in capacities from 63,000 to 480,000 B.t.u. per hour. The units may be installed high above the floor and so assure little difference between floor and ceiling temperatures.

Plug Valve

■ Merco Nordstrom Valve Co., 400 Lexington avenue, Pittsburgh, has introduced a lubricated plug valve capable of handling a working pressure of 7500 pounds. It is made of special alloy steel with both plug and interior contact surfaces faced with Merchrome. Heavy flanges and side walls are incor-

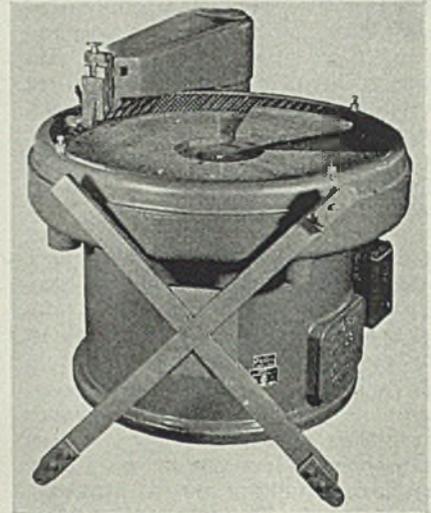


porated to prevent body distortion. Principally developed for recycling services in gas and oil fields, it has other applications where tremendous pressures are carried.

Disk Grinders

■ Hanchett Mfg. Co., Big Rapids, Mich., has developed a new No. 153 vertical spindle disk grinder which also may be arranged for wet grinding. Its 53-inch diameter abrasive grinding disk is made up in 8 sections and is attached to a 53-inch steel plate by means of filister head screws passing down through openings in the abrasive. The disk plate is attached to a wheel flange 34 inches in diameter by 4 inches thick. The wheel spindle which is mounted in preloaded precision-spindle ball

bearings is driven from a 25-horsepower vertical motor located within the machine base and connected to it by means of sheaves and V-belts. A rugged oscillating type wheel dresser is built into this machine passing from the outside of the disk to the center making it convenient to maintain a true grinding surface at all times. The wheel dresser arm



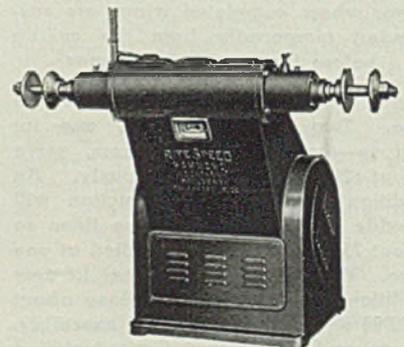
is swung entirely clear from the machine while work is being ground. Openings beneath the grinding disks are provided for attaching to the dust exhaust system. The approximate weight of the unit is 7500 pounds.

Fluorescent Lamp

■ Westinghouse Lamp division, Bloomfield, N. J., announces a new 6-watt 9-inch fluorescent lamp for use where space is limited and high lumen output is not required. Available in two colors, daylight and white, it has a rated average life of 750 hours.

Polishing Lathe

■ Hammond Machinery Builders Inc., Kalamazoo, Mich., has introduced the model 10-ROH polishing



lathe, suitable when working on large bulky pieces. It has an over-

hanging spindle. Front section of the overhanging spindle stands out 12½ inches from lower front of base. Standard equipment includes spindle lock for holding spindle when changing wheels, combination switch and brake which shuts off motor and instantly stops the revolving spindle, automatic motor starter and 10-horsepower motor with multi-V-belt drive mounted inside the base.

Laboratory Stills

■ F. J. Stokes Machine Co., 5964 Tabor street, Philadelphia, announces six new electrically-heated laboratory water stills in capacities of ½, 1 and 1½ gallons per hour. Each of these sizes is offered in two types, one with standard immersion heaters and the other with heavy-duty heating elements. The heavy-duty elements are recommended for use in hard water districts, where scale tends to build up rapidly. They have a built-in thermal safety switch that cuts off the current instantly in case of overheating.

Expansion and contraction of the flat blades of these elements tend to crack off scale as it forms. Other features of these stills include Pyrex glass covers, solid tin condenser tubes, triple vapor baffles, heavy, one-piece copper boiling chambers, automatic operation and a gas eliminator.

Grinding Attachment

■ Covel Mfg. Co., Benton Harbor, Mich., announces a No. 2 tap grinding attachment which is capable of handling a wide variety of sizes and styles of taps. It may be mounted on any grinding machine having a grinding wheel of 1¼-inch face or less. The attachment is quickly set up from one type or size of tap to another. Small taps, from 6 to ½-inch are held in a 3-jaw chuck, while larger taps are held on centers during grinding operation. A female center also is provided for small taps. The spindle of the attachment is mounted on dust-protected ball bearings.

Watchman's Tour System

■ Dudley Lock Corp., 325 North Wells street, Chicago, has developed a new watchman's tour system adaptable to every size and kind of industry. It provides complete mechanical control over the watchman's activities and protects him in case of mishap. It compels the inspection of specific parts of a property at prescribed time intervals; and it can also flash or permanently

record the time of inspection and summon aid in emergencies.

This system includes key stations with transmitting stations at start and finish of each series. The transmitting stations actuate any kind of signal or recording apparatus. A special clock records the date on a long roll of paper, and the exact time each transmitting station is visited. An additional service is the delayed alarm which gives a warning at any specified location when a transmitter box is not visited within a given time period.

The watchman's tour key is small enough to be carried inconspicuously in the pocket and consists of a

combination of three separate locks, operating only on a predetermined route and only in the proper sequence. It has a built-in cyclometer which counts the stations visited.

Roller Bearing

■ Timken Roller Bearing Co., Canton, O., announces a modification in the design of the standard NA type, or nonadjustable roller bearing. Made up of a double row outer race or cup and two single row inner races or cones, it is especially adapted to serve as a sheave bearing. The races and rolls are ground

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The thoroughly modern plant and experienced personnel of the former Great Lakes Forge Company have become an integral part of AMFORGE.

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and our engineers will promptly check them over and submit recommendations and prices on the quantities needed—without obligation of course. Avail yourself of this service.

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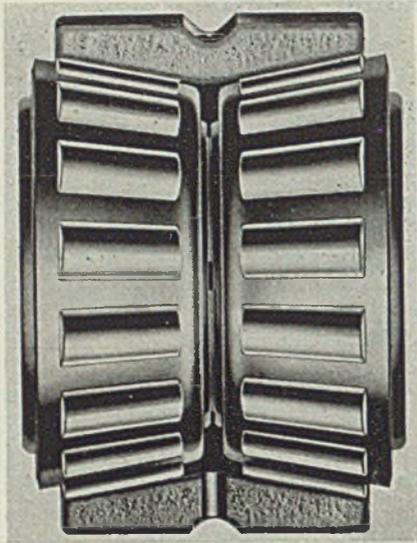
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**DROP
AND UPSET FORGINGS**



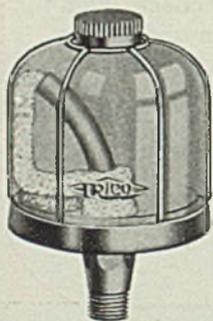
to establish precision limits so that when the cones are assembled into the cup the front faces of the cones contact and the proper running clearance is provided. The front cone faces are slotted and cham-



fered, as shown, to provide an entrance for lubricant. The problem of sealing the bearing chamber has been simplified by extending the length of the large cone rib and creating a surface concentric with the shaft and sheave bore on which a seal may be run. These seals have the same outer diameter as the cup and are pressed into the sheave bore. The bearings are designed to a minimum width and with an inner diameter large in relation to its outer diameter, and also with a maximum radial and thrust capacity for the space occupied.

Loose-Pulley Oiler

■ Trico Fuse Mfg. Co., 2948 North Fifth street, Milwaukee, announces a visible, unbreakable loose pulley oiler for slow and high speed appli-



cations. It employs three principles of operation—thermal, capillary and gravity action. A copper tube transmits the heat of the pulley hub to the oil reservoir to produce quick thermal action, the wire-reinforced wick feeds oil by cap-

illary action, and oil is dropped on the bearing by gravity. The oiler is available in 1 and 2-ounce capacities with $\frac{1}{8}$ or $\frac{1}{4}$ -inch pipe thread fittings.

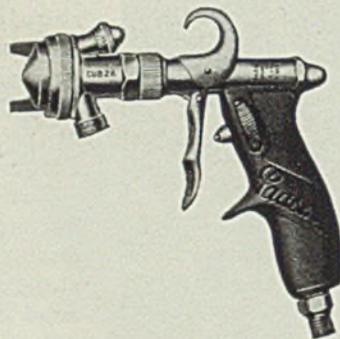
Swing Joint

■ Patterson-Ballagh Corp., 1900 East Sixty-fifth street, Los Angeles, announces a new swing joint for steam lines capable of handling steam pressures up to 100 pounds. It features a sealing unit of compounded rubber which contains a percentage of finely divided metallic lead. Because the lead acts as a lubricant, the joint turns freely under pressure. The gasket is expanded slightly by the heat, which helps to maintain a good seal.

The joint is of heavy bronze, weighs approximately $4\frac{1}{2}$ pounds and is available only in the $\frac{3}{4}$ -inch straight style.

Airbrush

■ Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, announces type CUB airbrush for use with pressure tank or overhead bucket, gravity or syphon cup. It is adjustable both for any air pressure or any air consumption, the shorter fluid passage both increasing coating speed and preventing clogging. The new airbrush provides a wider,



wetter spray and is equipped with new easy-grip black-tenite fluid-lock control and larger aircap.

Sand Sampler

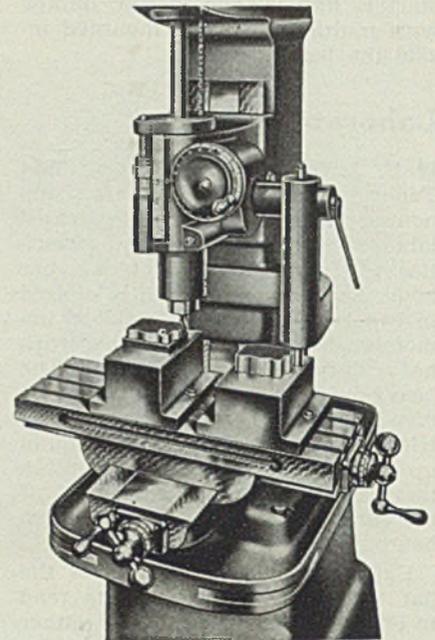
■ Harry W. Dietert Co., 9330 Roselawn avenue, Detroit, has introduced a molding sand sampler which facilitates the sampling of molding sand from the interior of a heap or bin. The length of its handle allows samples to be taken 24 inches from the outer surface of the heap. The handle is of cast aluminum with the shaft of steel. The conical sand container is pressed brass.

In use the sampler is inserted into the sand. The sand pushes through the tapered sand container as the sampler is pushed. When the operator pulls the sampler from the

sand, the tapered container grips and removes a 700-gram sample.

Profiling Attachment

■ Machinery Mfg. Co., P. O. Box 155, Vernon Branch, Los Angeles, has developed a new profiling at-



tachment for use on a combination vertical mill and jig borer. Its sliding head is constructed so this attachment can be easily and quickly engaged and disengaged. The attachment is especially designed for small lot machining or irregularly shaped forgings, but it also is applicable to contour milling from wood, plaster or plastic models.

Arc Welder

■ General Electric Co., Schenectady, N. Y., has placed on the market a new 200-ampere direct-current arc welder which provides any welding current from 25 to 250 amperes. It accommodates electrodes from $1/16$ to $3/16$ -inch in diameter for all-day jobs, and is capable of utilizing electrodes as large as $1/4$ -inch on occasional short jobs. The welder provides instant recovery of the voltage to an extent greater than the arc voltage after each short circuit and never allows current peaks to exceed three times the steady short-circuit current on any adjustment. Both of these features are made possible by a split-pole cross-field design.

Other advantages include good commutation, isothermic overload protection for the motor, self-excitation, quick adjustment of welding current and horizontal mounting. A ventilating system prevents overheating when the welder is operated within the proper range hour after hour.

Mass Production

(Concluded from Page 77)

the first floor or to the "ferris wheel," from the loading point near the center of the second floor, Fig. 1. A good view of this ferris-wheel portion of the conveyor system is Fig. 5.

In wing covering department, frame is covered with airplane fabric and given a coat of clear dope as the first finishing operation. Subsequently it is taped where the covering overlaps, followed by application of clear and pigmented dope. After rubbing between each coat, a final polish is applied before work goes to final assembly line. Fig. 4 shows wings in the second dope room where they are being rubbed between coats. Note how the overhead monorail hangers conveniently position wings for this operation.

On the ferris wheel in Fig. 5, both wings and fuselages are rotated for drying between spraying and rubbing of successive coats of dope.

Monorail System Flexible

Framework for fuselages is completed in the welding department and slung on the monorail conveyor for processing. One of the first operations is coating the frame with an aluminum alloy by means of a metallizing spray gun as shown in Fig. 2. This affords an excellent protective coating which is applied to all the seaplanes. Aircraft which operate away from salt water exposure is given an oxide coating in the priming department as protection.

Note in Fig. 2 that the single monorail through the spray booth can be moved to engage any one of five monorail lines at the open door. This and other switching arrangements permit great flexibility in routing the work through the plant and also provides for storage of fuselages on the conveyor lines.

After the protective coat has been applied, the controls are installed in the fuselages and brake assembly mounted in place. Next, the stabilizer and elevator mechanism installation is made, followed by placing the control wires.

At this stage fuselages are covered with airplane fabric in the covering departments noted in Fig. 1. This is followed by applying a clear spray first coat and taping with linen tape over the ribs, rivets, etc. Next, second and third coats of clear dope are applied.

Fuselages then go through the cawling department where cowls are mounted in place. After this, final coats of pigmented dope are applied and rubbed.

In the striping department, Fig. 3, stripes and numbers are painted on

the fuselages and wings while they are suspended from the conveyor. Everything then receives a careful polishing treatment. After placing of the cockpit assembly, fuselages go to the final assembly area, Fig. 7. Approximately 50 fuselages or as many wings can be handled on the conveyor system at one time. Because of the complexity of operations, flexible interchange from one track to another is provided. Often turntables are used where five or more tracks meet.

While the monorail track winds and crisscrosses through the plant, production operations are on a straight-line basis. If a monorail sufficient to handle the large volume of production operations were laid in a single straight line, a building over 4000 feet long would be required for the necessary manufacturing operations with many sidings and stopovers for the various subassemblies at numerous points. However, for many operations such as doping and rubbing, the work can be recycled through the same department by proper facilities provided.

Cub production, which totaled 100 units for the years 1931, 1932 and 1933, amounted to 72 for 1934, 211 for 1935, 550 for 1936, 1806 for 1939 and in the first six months of 1940 reached 1078 ships. During June alone, 323 were completed.

Develops Improved Alloy Die Steel

■ An improved alloy steel, known as Windsor special air hardening die steel, is announced by Jessop Steel Co., Washington, Pa. It is

a chromium-molybdenum-vanadium type metal developed for use where the initial cost of the tool or die must be held to a minimum. It is non-deforming, easily machined, tough and has a wide hardening range. It may be hardened and tempered in either oil or air.

Reduces Plant Hazards By Use of Voltmeter

■ Static electricity in a powder plant can become a very troublesome hazard. Recently a well-known chemical company conducted tests to find the extent electricity generated on the conveyor belts, motor-drive belts and rubber-tired trucks.

In checking the V-belt of a 25-horsepower motor, the 20,000-volt static voltmeter went off scale—observation of the discharge spark indicated the presence of approximately 37,000 volts on the V-belt.

These preliminary tests led to more extensive checks in all of the chemical company's plants. As a result, belt dressings were investigated to find one of a conducting nature that would permit a continuous discharge of accumulated static electricity. Trucks were equipped with grounding chains, various types of flooring were investigated and many other changes were made to minimize the hazards of explosion.

The electrostatic voltmeter used in detecting the static is a General Electric 20,000-volt portable instrument designed for both alternating and direct current measurements of voltage on systems where one line is grounded.



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High Production Line

(Concluded from Page 52)

hopper comes to rest, the second hopper starts its cycle. When this comes to rest, the third starts its cycle automatically and so on. As soon as the second hopper has completed its cycle, the first hopper may again be put into operation.

The final hot-rinse hopper in this line of four automatic hopper tanks discharges its contents to an opening in the automatic dryer at the end of the line, left foreground, Fig. 2. This dryer has a screw-type conveyor which carries the work from the loading end to the discharge

end, a distance of about 10 feet. The screw conveyor is enclosed in a perforated cage below which are steam coils. Air forced across the steam coils by a fan passes through the work to dry the parts as they tumble about in going through the screw conveyor. Parts then are discharged into tote pans, and the cleaning and plating operation is completed.

At the present time, seven men are required to operate this processing line. One man shovels stock into the cleaning cylinders. The second man operates the hoist to transfer cylinders from station to station of the cleaning unit. The

third man takes care of loading the plating cylinders from the transfer hopper. Fourth and fifth men work on the plating unit. Sixth man loads the automatic hoppers. Seventh handles work from the dryer unit. It is stated that with a slight change in procedure, this operating force could be reduced to five men who would still equal the present production of from 3000 to 4000 pounds of work per hour.

Without the automatic equipment embodied in this line, it would be extremely difficult to obtain this high production, even with a much larger crew. Also, the problems of uniformity and process control could easily get completely out of hand.

Offers Low Cost

Build-Up Welding Rod

■ A low cost manganese-molybdenum steel welding rod, Amsco Mo-Mang, for building up worn high manganese, carbon steel and gray iron castings is announced by American Manganese Steel division, American Brake Shoe & Foundry Co., Chicago Heights, Ill. It is available in 18-inch lengths in the bare form for straight direct-current welding, and in the combination coated form for both direct and alternating-current application.

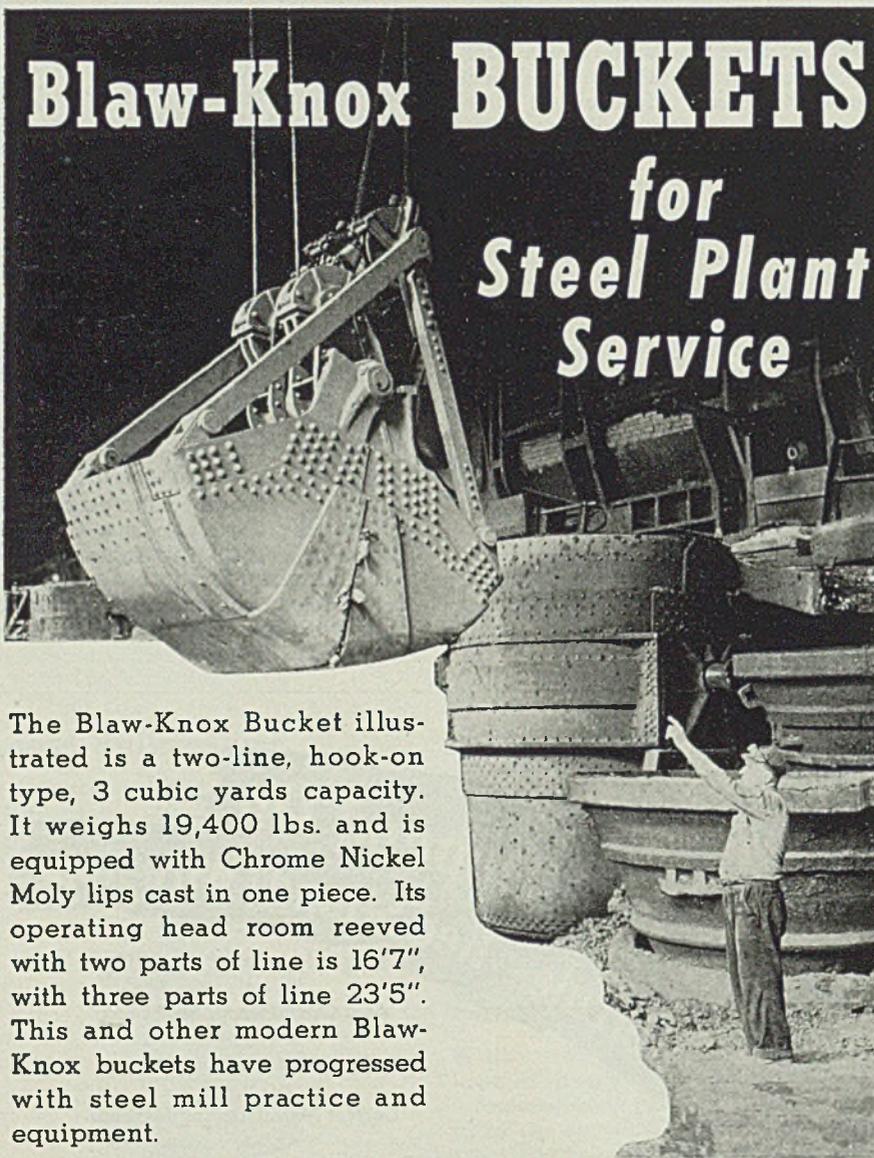
Older Machines

(Concluded from Page 49)

chips clogging otherwise would occur. "Chip breakers" on the tools themselves can, of course, be used to great advantage — especially where small size openings will only permit passage of small chips.

Back Lash: Before attempting to cut steel with cemented carbide tools, machines should be checked for excessive clearances which will cause chatter at high cutting speeds. Worn bearings, loose slides, and worn down ways should be replaced, adjusted or refitted. A certain amount of chatter can be corrected by the incorporation of negative rakes in the tools—where it is found impossible or impractical to tighten up the machine sufficiently to eliminate all vibration at its source.

With these simple considerations, there is no reason why any machine of not too antiquated design and in reasonably good physical condition cannot be used effectively for cutting steels with carbide tools, particularly where single point tools are used. If the machine is capable of handling the horsepower required at the higher speed and can be tightened up sufficiently to eliminate back lash and chatter, no trouble should be encountered in increasing greatly the productivity per machine through application of this modern tooling.



Blaw-Knox BUCKETS

for Steel Plant Service

The Blaw-Knox Bucket illustrated is a two-line, hook-on type, 3 cubic yards capacity. It weighs 19,400 lbs. and is equipped with Chrome Nickel Moly lips cast in one piece. Its operating head room reeved with two parts of line is 16'7", with three parts of line 23'5". This and other modern Blaw-Knox buckets have progressed with steel mill practice and equipment.

BLAW-KNOX BLAW-KNOX DIVISION
OF BLAW-KNOX CO.
Farmers Bank Bldg. · Pittsburgh, Pa.

Digging and Rehandling **BUCKETS**

Reader Comments

(Concluded from Page 4)

printed on the back:

1—All orders are subject to the approval of an executive officer at the home office in

2—All goods are shipped f. o. b. and are conditioned upon delivery at

3—The prices quoted are subject to the payment by the buyer of any taxes or additional costs due to federal, state, or municipal legislation.

If your industry has had a practice of quoting delivered prices, it is recommended that prices be quoted f. o. b. plant with freight allowed to destination. It is suggested that the freight be deducted as a separate item on the face of the invoice so if sales tax is imposed, the amount of the sale less freight will be used in figuring the tax.

Under the third provision there is a possibility that any tax imposed upon a present or past sale could be collected from the customer even if the transaction were paid for and closed. Such a provision would be convenient if a state were successful in collecting back taxes for an extended period.

The Supreme Court has shown no tendency to eliminate double taxation in connection with sales tax, although a few of the state laws provide an exemption in case the sale has already been taxed by another state. This means that even if your state has already passed a sales tax law, the considerations outlined are still pertinent. By confining the completion of all sales contracts to within your own state you are protecting yourselves as nearly as possible against being taxed in some other state.

EUGENE CALDWELL

Consulting management engineer
Milwaukee

Men of Industry

■ F. W. Werner, associated with the United States Steel Corp. and its subsidiaries since 1907, has been appointed assistant to president in charge of coke by-product sales of all subsidiary companies of the corporation. His office is at 71 Broadway, New York. Mr. Werner was named chief chemist, Central laboratory of Illinois Steel Co. in 1925. Five years later he became assistant to the late William A. Forbes, then in charge of coke by-product activities. Mr. Werner succeeded Mr. Forbes in May, 1936. He then was appointed assistant to vice president in charge of sales.

James C. Foster, since 1938 president of Northwestern Steel & Wire Co., Sterling, Ill., has resigned. Be-

fore affiliating with Northwestern Mr. Foster was general sales manager, Jones & Laughlin Steel Corp., Pittsburgh. Mr. Foster has not announced his plans for the future.

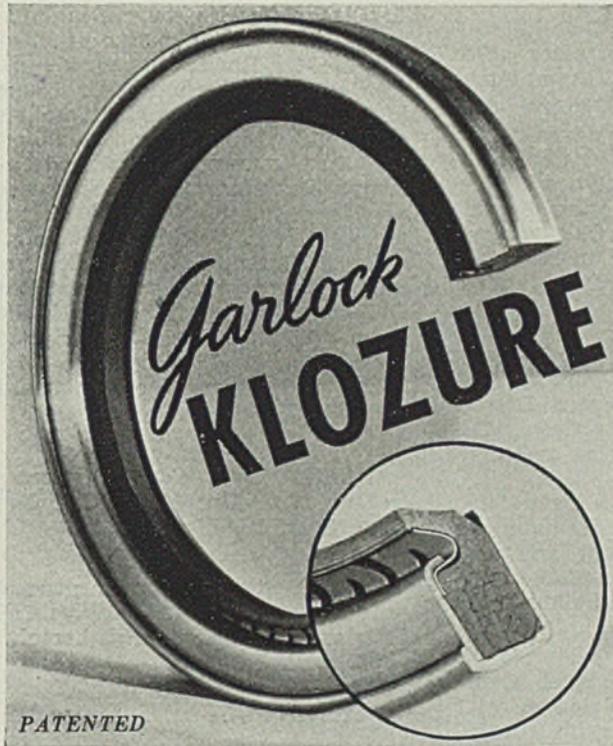
T. B. Daniels, since 1938 assistant warehouse manager at Chicago for Jones & Laughlin Steel Corp., has been named manager. He succeeds the late M. A. Blessing. He has been identified with Jones & Laughlin 21 years.

G. Hagerup-Larsen is now in this country, having arrived from Nor-

way through Japan. He represents Det Norske Aktieselskab for Elektrokemisk Industri, Oslo, Norway, which controls the Tysland-Hole electric furnace for smelting iron ores, as well as the Soderberg electrode which is standard equipment for this type of furnace. He will be located at 3 Washington square, New York.

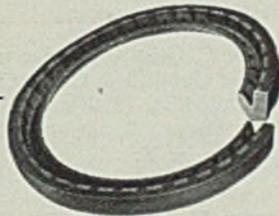
(Additional personnel items will be found on Page 38).

■ Factory employment in New York state in August included 3.4 per cent more workers than in July, according to Industrial Commissioner Frieda S. Miller.



RESISTS
OIL
AND
HEAT

OIL and heat are destructive enemies of the ordinary oil seal! But the Garlock KLOZURE, because it's made with an *exclusive* Garlock compound, *resists* these enemies—*stands up* month after month without losing its toughness, density and resiliency. The Garlock KLOZURE is furnished in a complete range of sizes. Write for booklet.



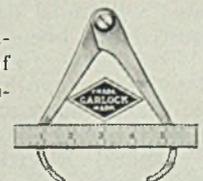
SPLIT-KLOZURE

To meet the need for an Oil Seal that can be installed around the shaft, rather than over the end of the shaft, Garlock has developed the new, patented SPLIT-KLOZURE. For all shafts of 3" diameter and larger. Write for special catalog.

THE GARLOCK PACKING COMPANY

PALMYRA, NEW YORK

In Canada:
The Garlock Packing Company of Canada Ltd., Montreal, Que.



Activities of Steel Users, Makers

■ REIN & WEBSTER INC., 1412 Keith building, Cleveland, have recently been organized to carry a full line of die castings, plastics, rubber moldings, stampings and screw machine products for manufacturers in Ohio, Pennsylvania, Indiana and Michigan. Firms represented are: Latrobe Die Casting Co., Latrobe, Pa.; Zenith Plastics Inc., Cleveland; Ackerman Plastic Molding Co., Cleveland; Metal Specialties Inc., Cincinnati, and Delo Screw Products Co., Delaware, O.

Globe Steel Tubes Co., Milwaukee, has established a sales office in Philadelphia, at 1033 Broad street Station building, in charge of Paul C. Lewis, sales agent.

R. E. Prill has established Practical Welding Engineering Service at 8216 Evans avenue, Chicago, providing welding service to manufacturers and fabricators of metal parts and machines.

H & H Research Co., Detroit, manufacturer of multi-purpose electrical tools, has appointed Detroit International Trading Corp., Detroit, its exclusive export agent.

Hanson-Van Winkle-Munning Co., Matawan, N. J., manufacturer of electroplating equipment and supplies, has started a 39 x 66-foot addition to its plant. The building will house a 10-ton crane.

Allegheny Ludlum Steel Corp., Pittsburgh, has completed a color and sound motion picture entitled "Steel for the Ages," dealing with manufacture of stainless steel from melting furnace to finished products.

Capewell Mfg. Co., Hartford, Conn., has installed equipment to manufacture hack saw blades, and the division, under supervision of David A. Utiger, will soon be in full production.

Cincinnati Bickford Tool Co., Cincinnati, has awarded contract to Austin Co., Cleveland, for erection of a new building and two additions which will provide 47,047 feet of floor space. Cost will be about \$140,000 and work is to be completed within 90 days. Equipment required has been ordered.

Preliminary work has begun on a new service shop and warehouse in the East Liberty district of Pittsburgh by General Electric Co., Schenectady, which will house the company's facilities now located in the

Terminal warehouse. One 15-ton and two 5-ton cranes will be installed for direct loading and unloading of trucks and a monorail system will be utilized for handling service shop materials.

Died:

■ CHARLES A. ROWAN, 66, chairman of the board, Westinghouse Air Brake Co., Pittsburgh, in Pittsburgh, Sept. 13. A native of Pittsburgh, Mr. Rowan began his career with Westinghouse Air Brake in 1903. He was assistant auditor until 1910 when he became auditor. He then successively served as comptroller, comptroller and vice president, and in 1927 was elected president of Westinghouse International Brake & Signal Co., retaining his post as vice president and comptroller of the air brake company. In 1932 he was elected president of Westinghouse Air Brake, and chairman of the board in 1936.

Griffith Chadwick, 70, former treasurer, Griffin Wheel Co., Chicago, Sept. 18, in that city.

John E. Stauffer, former general purchasing agent, A. M. Byers Co., Pittsburgh, recently, at his home in Crafton, Pa.

Charles T. Caskey, 54, secretary-treasurer, Jorgensen Engineering Co., Beloit, Wis., in that city, recently.

William Whitehead Erwin, vice president, Consolidated Edison Co. of New York, in charge of purchasing and stores, Sept. 12, in New York.

Victor C. Gilpin, 70, vice president, Triangle Conduit & Cable Co., which he founded in 1916 with J. E. McAuliffe, Sept. 2, at his home in Brooklyn, N. Y.

James M. Seymour Jr., 79, a consulting engineer and associate of the late Thomas A. Edison in many of his early experiments, Sept. 2, at his home in Newark, N. J.

August O. Gieseler, 61, general manager and a director of National Tool Co., Cleveland, before his re-

tirement in 1922, Sept. 3, at his home in Cleveland Heights, O.

Arthur S. Richardson, 60, assistant purchasing agent, Whitin Machine Works, Whitinsville, Mass., in Shrewsbury, Mass., Sept. 17. He was employed at the Whitinsville plant over 30 years.

Sir H. C. H. Carpenter, 65, professor of metallurgy at the Royal School of Mines, Imperial College of Science and Technology, London, in Swansea, Wales, Sept. 15. Professor Carpenter was one of the founders of the Institute of Metals, and from 1918 to 1920 was president of the institute. He was also past president of the Iron and Steel institute, Great Britain.

Fred Bros, associated with William Bros Boiler & Mfg. Co., Minneapolis, 54 years, and vice president of the company until his retirement in 1929, in that city, recently.

John Gessner, 64, retired secretary and auditor, Milwaukee Steel Foundry Co., Milwaukee, in that city, recently. He was associated with the company 17 years until his retirement in 1935.

Harold M. Spears, 45, general manager, Chevrolet transmission plant, Saginaw, Mich., recently. He joined the Chevrolet organization in 1917 as a metallurgist and became general manager of the Saginaw plant in 1937.

Richmond Dean, 79, retired vice president and former general manager, Pullman Co., Sept. 5, in Chicago. He joined Pullman Co. in 1882, became general manager in 1905, vice president in 1911 and retired in 1931.

John L. Harrison, manager of sheet and strip steel sales, Wheeling Steel Corp., Wheeling, W. Va., at his home in Wheeling, Sept. 17. Prior to joining Wheeling Steel in May, 1925, Mr. Harrison was general manager of sales, Newton Steel Co., Newton Falls, O., now a part of Republic Steel Corp., Cleveland.

Henry J. Fullerton, 66, in Cleveland, Sept. 9. A native of Cleveland, he was with Bethlehem Steel Co. a number of years, heading the company's wire and nail department at Sparrows Point, Md., before returning to Cleveland ten years ago. The past six years he had been identified with the Cleveland Hardware Co.

Consumers Covering Steel Needs Further Ahead

Deliveries Are Extended as Armament Work Gains Momentum; Steelworks Operations Hold at 93 Per Cent

■ STEELWORKS operations last week held at 93 per cent for the second consecutive week, highest point reached this year.

Virtually all products, except tin plate, are feeling the stimulus of increased demand. Delivery dates are being extended. The armament program is acquiring more momentum, and notable is the eagerness of general consumers to cover their requirements months ahead. Some orders now are being entered for delivery next year at prices ruling at time of shipment; particularly steels requiring special heat treating and annealing operations.

Most impressive is the amount of construction work being figured, and the volume of equipment required, linked with preparedness. As an example, the announced \$18,000,000 expansion program of the Savage Arms Co., at Utica, N. Y.

More than a score of cantonments are being figured. In addition to various other types of steel it is estimated these will require over 150,000 kegs of nails.

Large tonnages of structural shapes and plates are being placed for defense projects. Shape orders in the week included 7500 tons for Chrysler Corp.'s tank plant at Centerline, Mich.; 13,500 tons, mainly piling, for a navy drydock at Philadelphia and one at Norfolk, Va.; 5700 for two ship repair vessels for the navy on the West coast; 4250 tons of piling for an air base at Quonset Point, R. I.; 2300 tons for quartermasters' storage depot, Jeffersonville, Ind. For a gun assembly plant at Washington 3500 tons of shapes are pending; and for navy vessels on the West coast 17,600 tons of plates are up for bids.

A substantial increase is noted in the number of federal housing projects being estimated, requiring in the aggregate a heavy tonnage of steel. In the New York district 20,000 tons of shapes are being figured for grade crossing elimination work for the Long Island railroad, and 15,000 tons for elevated parkway construction in Brooklyn, on which bids were opened last week by the Triboro bridge authority. Eleven thousand tons of miscellaneous steel for a bridge in Hartford, Conn., was placed with a Pittsburgh fabricator.

Miscellaneous steel requirements, many associated with defense, are increasing. Among current inquiries

are 12,500 tons of billets for 155-millimeter shells for the army; 7500 tons of sheets for powder cans for the navy; 6000 tons of heavy sheets for depth bombs for Great Britain.

The United States war department ordered 18,000 gross lots of spoons, requiring 180 tons of stainless steel, and contracted for 14,500 reels of barbed wire for army posts. The government is reported to have placed 16,000 tons of sheets for additional corn cribs.

Railroad buying included 1000 gondolas for the Pittsburgh & Lake Erie, placed through the New York Central with its subsidiary, Despatch Shops Inc., Rochester. New York Central's rail requirements, on which bids will be opened Sept. 30, total 65,000 tons. Baltimore & Ohio has placed seven diesel-electric passenger engines; and the Boston & Maine, three steam engines. Chesapeake & Ohio has opened bids on 10 steam locomotives.

Automobile assemblies last week increased 12,205 over the week preceding, to 78,820.

The entire Great Lakes iron ore fleet, comprising 296 vessels, was in operation Sept. 15, first time since August, 1937. Nonintegrated steel mills have been in the market for pig iron, purchases in the eastern district in the past week including lots ranging up to 10,000 tons. Scrap is active, and prices strong. Contracts negotiated last week for wrecking more New York elevated railways will provide 95,000 tons of scrap.

Great Britain is reported negotiating for 150,000 tons of scrap, shipments to begin in November, when the last of present contracts for scrap will be completed.

Pittsburgh district steelworks operations last week were up 1½ points to 88½ per cent; Chicago up 1 to 98½; eastern Pennsylvania 1½ to 92; Birmingham 4 to 97; New England 5 to 80. Youngstown was down 3 points to 83 per cent; Wheeling 1 to 97; and Cincinnati 3 to 79; Cleveland 1 to 88, and Detroit 4 to 91. Buffalo was unchanged at 90½ and St. Louis remained at 80 per cent.

STEEL'S iron and steel price composite last week advanced 2 cents to \$37.96; the composite for finished steel was unchanged at \$56.60, and that for steelworks scrap held at \$20.13.

MARKET IN TABLOID ★

Demand

Brisk; buying further ahead.

Prices

Firm.

Production

Unchanged at 93 per cent.

COMPOSITE MARKET AVERAGES

	Sept. 21	Sept. 14	Sept. 7	One Month Ago Aug., 1940	Three Months Ago June, 1940	One Year Ago Sept., 1939	Five Years Ago Sept., 1935
Iron and Steel	\$37.96	\$37.94	\$37.81	\$37.70	\$37.69	\$36.67	\$32.82
Finished Steel	56.60	56.60	56.60	56.60	56.60	55.60	53.70
Steelworks Scrap . . .	20.13	20.13	19.50	18.71	19.03	17.97	12.65

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

COMPARISON OF PRICES

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

Finished Material	Sept. 21,	Aug. 1940	June 1940	Sept. 1939	Pig Iron	Sept. 21,	Aug. 1940	June 1940	Sept. 1939
	1940	1940	1940	1939		1940	1940	1940	1939
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh	\$24.34	\$24.34	\$24.34	\$23.35
Steel bars, Chicago	2.15	2.15	2.15	2.15	Basic, Valley	22.50	22.50	22.50	21.50
Steel bars, Philadelphia	2.47	2.37	2.37	2.37	Basic, eastern, del. Philadelphia	24.34	24.34	24.34	23.54
Iron bars, Chicago	2.25	2.25	2.25	2.05	No. 2 foundry, Pittsburgh	24.21	24.21	24.21	23.20
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago	23.00	23.00	23.00	22.20
Shapes, Philadelphia	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham	19.38	19.38	19.38	18.58
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2 del. Cincinnati	22.89	22.89	22.89	22.09
Plates, Pittsburgh	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ. av.)	25.215	25.215	25.215	24.115
Plates, Philadelphia	2.15	2.15	2.15	2.15	Malleable, Valley	23.00	23.00	23.00	22.00
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Chicago	23.00	23.00	23.00	22.50
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.00	Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	29.84
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh	23.17	23.17	23.17	22.15
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh	125.33	125.33	115.33	95.35
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.00	Scrap				
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05	Heavy melt. steel, Pitts.	\$20.75	\$18.75	\$19.90	\$18.75
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50	Heavy melt. steel, No. 2, E. Pa.	19.75	18.35	18.10	17.10
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60	Heavy melting steel, Chicago	19.25	18.15	18.00	16.05
Tin plate, per base box, Pitts.	\$5.00	\$5.00	\$5.00	\$5.00	Rails for rolling, Chicago	22.25	22.00	22.25	19.65
Wire nails, Pittsburgh	2.55	2.55	2.55	2.40	Railroad steel specialties, Chicago	21.50	21.05	21.40	18.00
Semifinished Material					Coke				
Sheet bars, Pittsburgh, Chicago	\$34.00	\$34.00	\$34.00	\$34.00	Connellsville, furnace, ovens	\$4.75	\$4.75	\$4.75	\$3.75
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00	Connellsville, foundry, ovens	5.75	5.75	5.75	5.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00	Chicago, by-product fdry., del.	11.25	11.25	11.25	10.50
Wire rods No. 5 to 1/2-inch, Pitts.	2.00	2.00	2.00	1.92	STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES				

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheet Steel		Granite City, Ill.	3.60c	Plates	21.50 22.00 25.50 30.50	Gulf ports	2.45c	
Hot Rolled		Middletown, O.	3.50c	Sheets	26.50 29.00 32.50 36.50	Birmingham	2.10c	
Pittsburgh	2.10c	Youngstown, O.	3.50c	Hot strip	17.00 17.50 24.00 35.00	St. Louis, del.	2.34c	
Chicago, Gary	2.10c	Pacific Coast ports	4.05c	Cold stp.	22.00 22.50 32.00 52.00	Pacific Coast ports	2.75c	
Cleveland	2.10c	Black Plate, No. 29 and Lighter		Tin and Terne Plate				
Detroit, del.	2.20c	Pittsburgh	3.05c	Tin Plate, Coke (base box)				
Buffalo	2.10c	Chicago, Gary	3.05c	Pittsburgh, Gary, Chicago \$5.00				
Sparrows Point, Md.	2.10c	Granite City, Ill.	3.15c	Granite City, Ill. 5.10				
New York, del.	2.34c	Long Ternes No. 24 Unassorted		Mfg. Terne Plate (base box)				
Philadelphia, del.	2.27c	Pittsburgh, Gary	3.80c	Pittsburgh, Gary, Chicago \$4.30				
Granite City, Ill.	2.20c	Pacific Coast	4.55c	Granite City, Ill. 4.40				
Middletown, O.	2.10c	Enamelling Sheets		Bars				
Youngstown, O.	2.10c	No. 10	No. 20	Soft Steel				
Birmingham	2.10c	Pittsburgh	2.75c	(Base, 20 tons or over)				
Pacific Coast ports	2.65c	Chicago, Gary	2.75c	Pittsburgh 2.15c				
Cold Rolled		Granite City, Ill.	2.85c	Chicago or Gary 2.15c				
Pittsburgh	3.05c	Youngstown, O.	2.75c	Duluth 2.25c				
Chicago, Gary	3.05c	Cleveland	2.75c	Birmingham 2.15c				
Buffalo	3.05c	Middletown, O.	2.75c	Cleveland 2.15c				
Cleveland	3.05c	Pacific Coast	3.40c	Buffalo 2.15c				
Detroit, delivered	3.15c	Corrosion and Heat-Resistant Alloys		Detroit, delivered 2.25c				
Philadelphia, del.	3.37c	Chrome-Nickel		Philadelphia, del. 2.47c				
New York, del.	3.39c	No. 302	No. 304	Boston, delivered 2.52c				
Granite City, Ill.	3.15c	Bars	24.00 25.00	New York, del. 2.49c				
Middletown, O.	3.05c	Plates	27.00 29.00	Gulf ports 2.50c				
Youngstown, O.	3.05c	Sheets	34.00 36.00	Pacific Coast ports 2.80c				
Pacific Coast ports	3.70c	Hot strip	21.50 23.50	Rail Steel				
Galvanized No. 24		Cold strip	28.00 30.00	(Base, 5 tons or over)				
Pittsburgh	3.50c	Straight Chromes		Pittsburgh 2.05c				
Chicago, Gary	3.50c	No.	No.	Chicago or Gary 2.05c				
Buffalo	3.50c	410	430 442 446	Detroit, delivered 2.15c				
Sparrows Point, Md.	3.50c	Bars	18.50 19.00 22.50 27.50	Cleveland 2.05c				
Philadelphia, del.	3.67c							
New York, delivered	3.74c							
Birmingham	3.50c							

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)

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

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

Twisted barbless wire, column

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

Detroit, delivered	2.70c
	2.80c

Alloy

S.A.E.	Diff.	S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.			0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.			1.10
5100 0.80-1.10 Cr.			0.45
5100 Cr. spring flats			0.15
6100 bars			1.20
6100 spring flats			0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200 spring flats			0.15
9200 spring rounds, squares 0.40 Electric furnace up 50 cents.			

Alloy Plates (Hot)

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

Strip and Hoops

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

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, 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

Chicago

Detroit, del.

Worcester, Mass.

Carbon Cleve., Pitts. 0.26-0.50

0.51-0.75

0.76-1.00

Over 1.00

Worcester, Mass. \$4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown 2.95c

Chicago

Detroit, del.

Worcester, Mass.

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill

Relay rails, Pittsburgh 20-100 lbs.

Light rails, billet qual., Pitts., Chicago, B'ham.

Do., rerolling quality ..

Do., rerolling quality ..

Angle bars, billet, mills. Do., axle steel

Spikes, R. R. base

Track bolts, base

Car axles forged, Pitts., Chicago, Birmingham. Tie plates, base

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.

Stove Bolts

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

Step bolts

Plow bolts

Nuts

Semifinished hex. U.S.S. S.A.E. 1/2-inch and less

3/4-1-inch

1 1/4-1 1/2-inch

1 1/2 and larger

Hexagon Cap Screws

Upset 1-in., smaller

Upset, 1-in., smaller

Headless set screws

Piling

Pitts., Chgo., Buffalo

Gulf ports

Pacific Coast ports

Rivets, Washers

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

Structural

1/2-inch and under

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

2" O.D. 13 13.04 15.03

2 1/2" O.D. 13 14.54 16.76

3" O.D. 12 16.01 18.45

3 1/2" O.D. 12 17.54 20.21

4" O.D. 12 18.59 21.42

4 1/2" O.D. 12 19.50 22.48

5" O.D. 11 24.62 28.37

5 1/2" O.D. 10 30.54 35.20

6" O.D. 10 37.35 43.04

6 1/2" O.D. 9 46.87 54.01

7" 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

6-in. & over, Chicago 53.80-54.80

6-in. & over, east fdy. 49.00

Do., 4-in.

Class A Pipe \$3 over Class B

Std. ftgs., Birm., base \$100.00.

Semifinished Steel

Rerolling Billets, Slabs (Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point. \$34.00

Duluth (billets)

Detroit, delivered

Forking Quality Billets

Pitts., Chi., Gary, Cleve., Young, Buffalo, Birm.

Duluth

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago.

Detroit, delivered

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 1/4-inch incl. (per 100 lbs.) \$2.00

Do., over 1/4 to 1/2-inch 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. 10.50

Chicago, delivered .. 11.25

Terre Haute, del. 10.75

Milwaukee, ovens. 11.25

New England, del. 12.50

St. Louis, del. 11.75

Birmingham, ovens. 7.50

Indianapolis, del. 10.75

Cincinnati, del. 10.50

Cleveland, del. 11.05

Buffalo, del. 11.25

Detroit, del. 11.00

Philadelphia, del. 11.15

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol. 15.00c

Toluol, two degree

Solvent naphtha

Industrial xylo.

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.)

Do. (1000 lbs. or over) 14.75c

Eastern Plants, per lb. Naphthalene flakes, balls, bbls. to jobbers

Per ton, bulk, f.o.b. port

Sulphate of ammonia. \$28.00

2" O.D. 13 13.04 15.03			
2 1/2" O.D. 13 14.54 16.76			
3" O.D. 12 16.01 18.45			
3 1/2" O.D. 12 17.54 20.21			
4" O.D. 12 18.59 21.42			
4 1/2" O.D. 12 19.50 22.48			
5" O.D. 11 24.62 28.37			
5 1/2" O.D. 10 30.54 35.20			
6" O.D. 10 37.35 43.04			
6 1/2" O.D. 9 46.87 54.01			
7" O.D. 7 71.96 82.93			

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 2 1/2 and 1 1/2 less, respectively. Wrought pipe, Pittsburgh base.			
Butt Weld Steel			
In.	Blk.	Galv.	
1/2	63 1/2	54	
3/4	66 1/2	58	
1-3	68 1/2	60 1/2	
Iron			
3/4	30	13	
1-1 1/4	34	19	
1 1/2	38	21 1/2	
2	37 1/2	21	
Lap Weld Steel			
2	61	52 1/2	
2 1/2-3	64	55 1/2	
3 1/2-6	66	57 1/2	
7 and 8	65	55 1/2	
9 and 10	64 1/2	55	
11 and 12	63 1/2	54	
Iron			
2	30 1/2	15	
2 1/2-3 1/2	31 1/2	17 1/2	
4	33 1/2	21	
4 1/2-8	32 1/2	20	
9-12	28 1/2	15	
Line Pipe Steel			
1 to 3, butt weld	67 1/2		
2, lap weld	60		
2 1/2 to 3, lap weld	63		
3 1/2 to 6, lap weld	65		
7 and 8, lap weld	64		
10-inch lap weld	63 1/2		
12-inch, lap weld	62 1/2		
Iron			
3/4 butt weld	25	7	
1 and 1 1/4 butt weld ..	29	13	
1 1/2 butt weld	33	15 1/2	
2 butt weld	32 1/2	15	
1 1/2 lap weld	23 1/2	7	
2 lap weld	25 1/2	9	
2 1/2 to 3 1/2 lap weld ..	26 1/2	11 1/2	
4 lap weld	28 1/2	15	
4 1/2 to 8 lap weld ..	27 1/2	14	
9 to 12 lap weld ..	23 1/2	9	

Boiler Tubes

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

Lap Welded			
Sizes	Gage	Steel	Iron
1 1/2" O.D. 13	\$ 9.72	\$23.71	
1 3/4" O.D. 13	11.06	22.93	
2" O.D. 13	12.38	19.35	
2 1/4" O.D. 13	13.79	21.68	
2 1/2" O.D. 12	15.16		
2 3/4" O.D. 12	16.58	26.57	
3" O.D. 12	17.54	29.00	
3 1/2" O.D. 11	23.15	39.81	
4" O.D. 10	28.66	49.90	
5" O.D. 9	44.25	73.93	
5 1/2" O.D. 7	68.14		

Seamless

—The Market Week—

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.	23.06	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

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

Delivered from Basing Points:

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

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., 2 1/2

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
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Ferrovandium, 35 to 40%, lb., cont.

	2.70-2.80-2.90
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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
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Ferrochrome, 66-70 chromi-

um, 4-6 carbon, cts. lb., contained cr., del. carlots	11.00c
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Do., ton lots 11.75c

Do., less-ton lots 12.00c

67-72% low carbon:

Car-	Ton	Less
loads	lots	ton
2% carb.	17.50c	18.25c
1% carb.	18.50c	19.25c
0.10% carb.	20.50c	21.25c
0.20% carb.	19.50c	20.25c
Spot 1/4c higher	.....	20.75c

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.

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

Do., spot 160.00

Do., contract, ton lots 160.00

Do., spot, ton lots 165.00

Alsiifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c

Do., ton lots 8.00c

Do., less-ton lots 8.50c

Spot 1/4c 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, 1/4c 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. 84.00c

Do., spot 89.00c

88% chrome, contract 83.00c

Do., spot 88.00c

No. 2 Malle- Besse-

Fdry. able Basic mer

St. Louis from Birmingham †23.12 22.62

St. Paul from Duluth 25.63 25.63 26.13

†Over 0.70 phos.

Low Phos.

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

Gray Forge

Valley furnace \$22.50

Pitts. dist. fur. 22.50

Charcoal

Lake Superior fur. \$27.00

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

Ladle Brick

(Pa., O., W. Va., Mo.)

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

Fire Clay Brick

Dry press \$28.00

Wire cut 26.00

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

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, Ply-

mouth 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 20.00

Do. barge 20.00

No. 2 lump 21.00

Ferroalloy Prices

Silicon Metal, 1% iron, contract, carlots, 2 x 1/2-in., lb. 14.00c	Do., 2% 12.50c	Spot 1/4c 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 1/4-cent higher.	
Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c	Ton lots 5.50c	Less-ton lots 5.75c
Spot 1/4c higher		
Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton 102.50	Do., spot 107.50	34-40%, contract, car- loads, lb., alloy 14.00c
Do., ton lots 15.00c	Do., less-ton lots 16.00c	Spot 1/4c 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 80.00c		

WAREHOUSE STEEL PRICES

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

	Soft Bars	Bands	Hoops	Plates ½-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars—		
							Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	S.A.E. 2300	S.A.E. 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.66	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.05	3.51	4.09	8.59	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.00	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	...	5.05	...	4.05	...	...
Norfolk, Va.	4.00	4.10	...	4.05	4.05	5.45	3.85	...	5.40	...	4.15	...	...
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.00	3.22	3.75	8.15	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	...	4.45	...	3.65	8.15	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.42	3.20	3.75	8.15	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.25	4.30	4.64	3.20	3.80	8.45	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	...	5.00	...	4.42	...	...
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.47	4.00	8.50	7.10
Chicago	3.50	3.40	3.40	3.55	3.55	5.15	3.05	4.10	4.60	3.30	3.75	8.15	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.86	8.38	6.98
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	...	5.00	...	4.30	...	...
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	...	4.76	...	3.97	...	...
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	...	5.25	...	4.31	...	...
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.70	...	4.40	...	4.39	...	...
Tulsa, Okla.	4.44	4.34	4.34	4.33	4.33	5.93	3.99	...	5.71	...	4.69	...	...
Birmingham	3.50	3.70	3.70	3.55	3.55	5.88	3.45	...	4.75	...	4.43	...	...
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	...	4.80	5.00	4.60	...	...
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	...	5.25	...	...	...	...
Seattle	4.00	3.85	5.20	3.65	3.75	5.75	3.70	6.50	5.00	...	5.75	...	...
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	...	5.75	...	...
Los Angeles	4.15	4.60	4.45	4.00	4.00	6.40	4.30	6.50	5.25	...	6.60	10.65	9.80
San Francisco	3.50	4.00	6.00	3.35	3.35	5.60	3.40	6.40	5.15	...	6.80	10.65	9.80

BASE QUANTITIES

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

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

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

Galvanized Sheets: Base, 1500-3499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Official Rates of Exchange

Export Prices f.o.b. Port of Dispatch—

Domestic Prices at Works or Furnace—

Ry Cable or Radio

Last Reported

	Continental Channel or North Sea ports gross tons:		L & D	French		Belgian		Helen	
	British gross tons U. K. ports	Quoted in dollars at f s d current value		£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
Foundry, 2.50-3.00 St.	...	\$33 23	3 18 0	...	...	...	...	...	...
Basic bessemer
Hematite, Phos. .03-.05
Billets	...	\$31 95	3 15 0	...	...	...	...	...	...
Wire rods, No. 5 gauge	...	60.71	7 2 6	...	...	...	...	...	...
Standard rails	...	\$48 99	5 15 0	...	...	...	...	...	...
Merchant bars	...	2 75c	7 6 0	...	...	...	...	...	...
Structural shapes	...	2 48c	7 9 0	...	...	...	...	...	...
Plates, 1½ in. or 5 mm.	...	2 68c	9 6 0	...	...	...	...	...	...
Sheets, black, 24 gauge or 0.5 mm.	...	3 40c	7 17 0*	...	...	...	...	...	...
Sheets, galv., 24 ga., corr.	...	3 95c	10 7 6	...	...	...	...	...	...
Bands and strips	7 5 0	...	...	...	...	...	...
Plain wire, base	5 6 3	...	...	...	...	...	...
Galvanized wire, base	9 17 6	...	...	...	...	...	...
Wire nails, base	9 7 6	...	...	...	...	...	...
Tin plate, box 108 lbs.	...	\$ 5 61	1 7 9	...	...	...	...	...	...

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

*Gold price sterling 164.00. **1% 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.	16.50
Bos. dock No. 1 exp.	16.75-17.00
New Eng. del. No. 1	17.00-17.50
Buffalo, No. 1	19.50-20.00
Buffalo, No. 2	17.50-18.00
Chicago, No. 1	19.00-19.50
Chicago, auto, no alloy	18.00-18.50
Cincinnati, dealers	16.25-16.75
Cleveland, No. 1	19.50-20.00
Cleveland, No. 2	18.50-19.00
Detroit, No. 1	†16.00-16.50
Detroit, No. 2	†15.00-15.50
Eastern Pa., No. 1	20.50-21.00
Eastern Pa., No. 2	19.50-20.00
Federal, Ill., No. 2	15.75-16.25
Granite City, R. R. No. 1	16.25-16.75
Granite City, No. 2	15.25-15.75
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.)	22.00-22.50
Pittsburgh, No. 1	20.50-21.00
Pittsburgh, No. 2	19.50-20.00
St. Louis, No. 1	16.25-16.75
St. Louis, No. 2	15.50-16.00
San Fran., No. 1, net	13.00-13.50
San Fran., No. 2, net	12.00-12.50
Seattle, No. 1	15.00
Toronto, dlrs., No. 1	11.00
Valleys, No. 1	20.50-21.00

Buffalo	13.00-13.50
Chicago	12.50-13.00
Cincinnati, dealers	9.25-9.75
Cleveland, no alloy	12.50-13.00
Detroit	†10.00-10.50
Eastern Pa.	14.50
Los Angeles	4.00-5.00
New York	†9.00-9.50
Pittsburgh	16.00-16.50
St. Louis	9.50-10.00
San Francisco	5.00
Toronto, dealers	7.00-7.25
Valleys	13.50-14.00

SHOVELING TURNINGS

Buffalo	14.00-14.50
Cleveland	13.00-13.50
Chicago	13.25-13.75
Chicago, spcl, anal.	14.50-15.00
Detroit	†12.00-12.50
Pitts., alloy-free	17.00-17.50

BORINGS AND TURNINGS

<i>For Blast Furnace Use</i>	
Boston district	†7.25-7.50
Buffalo	12.50-13.00
Cincinnati, dealers	7.50-8.00
Cleveland	13.00-13.50
Eastern Pa.	13.00-13.50
Detroit	†11.00-11.50
New York	†8.75-9.00
Pittsburgh	14.00-14.50
Toronto, dealers	6.75

AXLE TURNINGS

Buffalo	16.00-16.50
Boston district	†11.50-12.00
Chicago, elec. fur.	18.00-18.50
East. Pa. elec. fur.	17.50-18.00
St. Louis	13.00-13.50
Toronto	6.00-6.50

CAST IRON BORINGS

Birmingham	8.50
Boston dist. chem.	†9.25-9.50
Buffalo	12.50-13.00
Chicago	13.00-13.50
Cincinnati, dealers	7.50-8.00
Cleveland	13.00-13.50
Detroit	†11.50-12.00
E. Pa., chemical	14.50-15.00
New York	†8.75-9.00
St. Louis	9.50-10.00
Toronto, dealers	6.75

RAILROAD SPECIALTIES

Chicago	21.25-21.75
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ANGLE BARS—STEEL

Chicago	22.50-23.00
St. Louis	19.50-20.00

SPRINGS

Buffalo	24.00-24.50
Chicago, coil	23.00-23.50
Chicago, leaf	22.00-22.50
Eastern Pa.	24.50-25.00
Pittsburgh	26.50-27.00
St. Louis	21.00-21.50

STEEL RAILS, SHORT

Birmingham	18.00
Buffalo	24.00-24.50
Chicago (3 ft)	21.50-22.00
Chicago (2 ft)	22.50-23.00
Cincinnati, dealers	23.00-23.50
Detroit	†21.50-22.00
Pitts., 3 ft. and less	26.00-26.50
St. L. 2 ft. & less	22.50-23.00

STEEL RAILS, SCRAP

Birmingham	16.50
Boston district	†14.50-15.00

Buffalo	22.00-22.50
Chicago	19.25-19.75
Cleveland	23.50-24.00
Pittsburgh	23.50-24.00
St. Louis	19.00-19.50
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net	12.50-13.00
Cincinnati, dealers	12.00-12.50

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	13.50-14.00
Cincinnati, dealers	11.50-12.00
Eastern Pa.	18.00
New York	†12.00-12.50
St. Louis	14.00-14.50

RAILROAD WROUGHT

Birmingham	14.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	20.00-20.50
St. Louis, No. 1	13.50-14.00
St. Louis, No. 2	15.50-16.00

FORGE FLASHINGS

Boston district	†12.00-12.25
Buffalo	17.50-18.00
Cleveland	18.00-18.50
Detroit	†16.00-16.50
Pittsburgh	19.00-19.50

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	22.50-23.00

LOW PHOSPHORUS

Cleveland, crops	23.00-23.50
Eastern Pa., crops	25.00-25.50
Pitts., billet, bloom slab crops	26.00-26.50

LOW PHOS. PUNCHINGS

Buffalo	23.50-24.00
Chicago	22.25-22.75
Cleveland	21.00-21.50
Eastern Pa.	25.00-25.50
Pittsburgh	25.50-26.00
Seattle	15.00
Detroit	†19.50-20.00

RAILS FOR ROLLING

<i>5 feet and over</i>	
Birmingham	18.00
Boston	†15.75-16.00
Chicago	22.00-22.50
New York	†18.00-18.50
Eastern Pa.	23.00-23.50
St. Louis	22.00-22.50

STEEL CAR AXLES

Birmingham	18.00
Boston district	†18.50-19.00
Chicago, net	23.00-23.50
Eastern Pa.	25.00-25.50
St. Louis	23.00-23.50

LOCOMOTIVE TIRES

Chicago (cut)	22.50-23.00
St. Louis, No. 1	17.50-18.00

SHAFTING

Boston district	†19.00-19.25
New York	†19.00-19.50

Eastern Pa.	25.00-25.50
St. Louis, 1½-3¼"	19.00-19.50

CAR WHEELS

Birmingham, iron	15.00
Boston dist., iron	†15.25-15.50
Buffalo, steel	24.00-24.50
Chicago, iron	20.00-20.50
Chicago, rolled steel	23.25-23.75
Cincin., iron deal.	19.50-20.00
Eastern Pa., iron	21.50-22.00
Eastern Pa., steel	24.50-25.00
Pittsburgh, iron	21.00-21.50
Pittsburgh, steel	26.50-27.00
St. Louis, iron	19.00-19.50
St. Louis, steel	21.00-21.50

NO. 1 CAST SCRAP

Birmingham	16.50
Boston, No. 1 mach.	†15.75-16.25
N. Eng. del. No. 2	15.25-15.75
N. Eng. del. textile	19.50-20.00
Buffalo, cupola	18.50-19.00
Buffalo, mach.	20.00-20.50
Chicago, agri. net.	15.00-15.50
Chicago, auto net.	17.75-18.25
Chicago, rail'd net	16.00-16.50
Chicago, mach. net.	16.50-17.00
Cincin., mach. deal.	20.00-20.50
Cleveland, mach.	21.75-22.25
Detroit, cupola, net.	†17.00-17.50
Eastern Pa., cupola	22.00-22.50
E. Pa., No. 2 yard.	18.50-19.00
E. Pa., yard fdry.	19.00-19.50
Los Angeles	16.50-17.00
Pittsburgh, cupola	19.50-20.00
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	18.75-19.25
St. L., No. 1 mach.	19.00-19.50
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break	†15.25-15.50
New England, del.	16.25-16.75
Buffalo, break	17.50-18.00
Cleveland, break, net	16.50-17.00
Detroit, auto net.	†17.25-17.75
Detroit, break.	†15.00-15.50
Eastern Pa.	21.00
Los Ang., auto, net.	13.00-14.00
New York break.	†16.00-16.50
Pittsburgh, break	16.50-17.00

STOVE PLATE

Birmingham	10.00-11.00
Boston district	†11.50-11.75
Buffalo	16.00-16.50
Chicago, net	12.50-13.00
Cincinnati, dealers	12.00-12.50
Detroit, net	†12.00-12.50
Eastern Pa.	17.50
New York fdry	†13.00
St. Louis	†13.00-13.50
Toronto dealers, net	12.00

MALLEABLE

New England, del.	22.00-23.00
Buffalo	22.50-23.00
Chicago, R. R.	22.00-22.50
Cincin. agri., deal.	17.25-17.75
Cleveland, rail.	22.50-23.00
Eastern Pa., R. R.	22.50-23.00
Los Angeles	12.50
Pittsburgh, rail.	23.50-24.00
St. Louis, R. R.	19.50-20.00

Ores

Lake Superior Iron Ore	
<i>Gross ton, 51½%</i>	
<i>Lower Lake Ports</i>	
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	
<i>Cents, unit, del. E. Pa.</i>	
Foundry and basic	56-63%, contract. 10.00
Foreign Ore	
<i>Cents per unit, c.i.f. Atlantic ports</i>	
Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos	nom.

Spanish, No. African basic, 50 to 60%	nom.
Chinese wolframite, net ton, duty pd.	\$23.50-24.00
Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c
F.O.B. Rio Janeiro.	
Scheelite, imp.	\$26.00
Chrome ore, Indian, 48% gross ton, cif.	\$28.00-30.00

Manganese Ore	
<i>Including war risk but not duty, cents per unit cargo lots.</i>	
Caucasian, 50-52%	60.00
So. African, 50-52%	58.00-59.00
Indian, 49-50%	56.00
Brazilian, 46%	50.00-53.00
Cuban, 50-51%, duty free	71.00-73.00
Molybdenum	
Sulphide conc., lb., Mo. cont., mines	\$0.75

Sheets, Strip

Sheet & Strip Prices, Pages 88, 89

Pittsburgh—Although shipments are holding steady, there has been spottiness in sheet releases, due principally to the vagaries of automotive producers. Considerable miscellaneous buying has been appearing, all at full quoted price levels. There is some indication that export demand will move up. Merchant market demand also is somewhat more active, with galvanized sheet production up to 76 per cent of capacity.

Chicago—Orders for steel sheets and strip continue flowing into mills at rates which are extending deliveries a couple of weeks, in addition to the six to eight weeks backlogs. Stampers are unusually busy, and the automotive and building trades continue to increase their volumes of specifications in hand. The outstanding item of new business covered 16,000 tons of galvanized sheets for government corn bins in Kansas and Nebraska. Carnegie-Illinois Steel Corp. seems to have obtained the bulk of the sheet tonnage required, an Ohio mill was credited with a fair tonnage.

Boston—Orders, shipments and backlogs on narrow cold strip continue on an even keel. The two former are about equal and volume on mill books is not being reduced to any extent.

New York—Notwithstanding the heavy movement in sheets this month, which is being stimulated considerably by the Sept. 30 deadline on shipments booked at concessions, substantial additional tonnage will be required to round out fourth quarter needs. Actual fabrication of sheets is being stimulated not only by expanding defense and commercial requirements but by the disposition of some manufacturers to build up stocks as fast as possible before it becomes necessary for them to divert an increasing amount of their capacity to national preparedness contracts. Indicative of the diversification of some of these latter contracts are orders now being placed for 18,000 gross lots of spoons for the army, requiring about 190 tons of stainless steel.

Sheet requirements for armaments continue to expand, with 6000 tons of heavy gage material now being figured by an eastern manufacturer for depth bombs for the British government. Metal fabricators here are figuring on 30,000 10-gallon gasoline containers for the army.

Philadelphia—Deliveries offered by some producers are lengthening, although certain mills continue to give shipment of three weeks or

more on hot and cold rolled material. In other instances deliveries are backed up five to six weeks. Miscellaneous buying is sustained in total volume despite the somewhat spotty character of demand. Considerable prospective business related to defense work is pending, a large part of which is expected to require a month or more to materialize into orders. Included in this classification is 7500 tons required for powder cans for the navy.

Cincinnati—Sheet purchasing extends well into the fourth quarter, showing consumers' concern over deliveries. Some buyers are believed to be stocking sheets and strip. Automotive needs are steadily increasing.

Birmingham, Ala.—Although some improvement is noted in demand for sheets, the market is hardly as strong as might be expected. Output and deliveries, while satisfactory, are not up to other steel specifications in this district.

Plates

Plate Prices, Page 88

Pittsburgh—Backlogs continue to increase, with deliveries practically out of sight on wide plates and some difficulties now appearing in the narrower widths. Work is underway on expansion of facilities for producing armor plate at Carnegie-Illinois Steel Corp. at Mingo and Homestead works. It is doubtful if this will alleviate much of the jam, although it will aid in the production of light armor plate. Carnegie-Illinois Steel Corp. this week issued extra lists on alloy plates, a product which heretofore has had no separate base.

Boston—Steady and substantial plate releases for shipbuilding are supported by improved buying by miscellaneous industrial consumers and slightly better specifications by railroads. Boiler shops also are fabricating more plates. New orders are both more numerous and tend to be heavier individually. Consumers are showing a tendency to estimate requirements in advance. Demand for floor plates for ships and miscellaneous users has also improved at firm prices. 3.35c, Pittsburgh base, or 3.79c, delivered Boston. Consumption of 3/16-inch carbon plates for small tanks is also more active.

New York—Plate schedules are tightening. While some sellers can still make fairly prompt deliveries this is now becoming more the exception than the rule. Few mills have anything to offer under three weeks and on an average three to

five weeks appears about the best deliveries.

Demand here is diversified. An increasing amount stems from government needs. Particularly is this true in connection with ship plate.

Philadelphia—Plate orders are fairly steady, and prospects are favorable for continuation of active mill engagement for an extended period. Export business tends to lag, although a slight pickup is noted in British and Japanese inquiries. Some producers view foreign buying as relatively slow, considering that European sources of supply have been cut off from world markets. A 16,000 ton inquiry from Sweden is reported still pending.

Birmingham, Ala.—Plates are very active, due mainly to car orders, shipbuilding and requirements from tank manufacturers. On top of large orders already booked prospects are bright for considerable tonnage for Mobile as a result of shipbuilding there. Pressure for delivery is evident in all quarters.

Seattle—Demand for plates is increasing with placing of important ship construction contracts with plants in the Pacific Northwest.

Plate Contracts Placed

- 3500 tons, ship repair vessel, navy, to Los Angeles Shipbuilding Co., Los Angeles.
- 2215, including 590 tons, fabricated high-strength low-alloy deck supports, and 1625 tons, fabricated high-strength low alloy steel plates, Panama, schedule 4274, bids Sept. 9, to U. S. Steel Export Corp., Washington.
- 845 tons, 48-inch welded steel pipe, Bellingham, Wash., to Steel Tank & Pipe Co., Portland, Oregon.
- 300 tons, 10 tanks, Gulf Oil Corp., Toledo, O., to Hammond Iron Works, Warren, Pa.
- 100 tons, United States Engineer office, Portland, Ore., to unnamed interests.
- 100 tons or more, 500,000-gallon elevated steel water tank, Chanute field, Pantou, Ill., to Chicago Bridge & Iron Co., Chicago, \$43,510, inv. 6027-11, bids Sept. 3, to constructing quarter-master, that station.
- 100 tons or more, two 250,000-gallon elevated water tanks, Camp Custer, Michigan, to Pittsburgh-Des Moines Steel Co., Chicago, \$49,300, invitation 6913-4, constructing officer.

Plate Contracts Pending

- 8000 tons, ten seaplane tenders, navy department for use on West Coast, bids Sept. 25.
- 7000 tons, lighters for navy department, schedule 2764, Associated Shipbuilding Co., Seattle, Wash., low on one and Western Pipe & Steel Co., San Francisco, low on ten for Mare Island navy yard.
- 2500 tons, floating drydock for navy department, schedule 9950, bids Sep. 26.
- 1280 tons, fabricated high-strength low-alloy steel plates, eye-bolts, bolts and cap screws, Panama, schedule 4333, bids postponed from Sept. 12 to 23.
- 500 tons or more, 10,500 feet 48 inch,

Bars

Bar Prices, Page 88

Chicago—Strenuous and continued demand for steel bars in all commercial forms coming from consumers all over this area is steadily expanding the activities of the mills here and satisfactory rolling schedules are becoming almost a daily problem. Among the most pressing users are the forging concerns which are maintaining operations at a high level and with bright prospects for the autumn as they begin to swing

into products destined for the national defense program.

Boston—With consumption rising and outlook strong alloy steel bar specifications are heavier and new buying tends upward. Only to a slightly smaller degree is this true of carbon bars. Deliveries on both are lengthening, notably alloys as consumers seek to cover more in advance. In alloys, the pressure is largely by holders of defense program contracts for small arms and other equipment. Expanding production of semiautomatic rifles at Springfield, Mass., is bringing out increasing inquiry for chromium-molybdenum stock and for chains. Boston navy yard requires 280 nickel steel bars, bids Oct. 1. Newport, R. I., station closes Sept. 27 on a fair tonnage of steel blanks and heads.

New York—Carbon bar deliveries are expanding modestly, with four to five weeks the general average. In alloy bars deliveries of six to nine weeks are being generally quoted and where special heat treatment is required, shipments not infrequently run into next year.

Munitions buying is increasing considerably, particularly for shell work, several sizable inquiries pending for cold drawn bars. One inquiry here involves 12,500 tons of billets for 800,000 155-millimeter shells for the army.

Philadelphia—Bar deliveries continue to lengthen especially on quality material. Some makers of electric furnace alloys are unwilling to promise deliveries within six months, although ten weeks or less can be done where the requirement is urgent. Carbon bar deliveries range from four to six weeks and on open-hearth alloy grades three to six. Insistent demand for bars continues from practically all consumer classifications, including makers of machine tools, chain, bearings, materials handling equipment, etc. New commitments from railroads are lighter.

Birmingham, Ala.—Bar production is steady at about 80 per cent of capacity.

Wire

Wire Prices, Page 89

Pittsburgh—Increasing activity is noticeable in the merchant market. Agricultural demand is increasing and is expected to run into fair tonnage. Industrial fence in connection with the industrial expansion program has become an important item. Manufacturers' wire releases are fairly good.

Boston—Tonnage consumers of wire are anticipating requirements

5/16 inch welded steel water pipe for Bellingham, Wash.; Steel Tank & Pipe Co., Portland, low.
Unstated, welded steel pipe for Roza division; bids to reclamation bureau, Yakima, Wash., Oct. 2.
Unstated, 10 seaplane tenders in lots of two, four or six, bids postponed to Oct. 16.
Unstated tonnage, 200,000-gallon steel tank and tower, veterans hospital, Marion, Ill., bids Oct. 8, Washington.
Unstated tonnage, one steel barge and equipment, U. S. engineer, St. Paul, Minn., invitation 23; bids Oct. 10.
Unstated tonnage, eight mine sweepers in lots of two, three or four, navy department, bids postponed from Sept. 18 to Oct. 30.

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- IN PRODUCT PERFORMANCE

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further ahead, through fourth quarter in some instances, and incoming orders and specifications are well maintained with spotty gains. Spring wire demand has improved and rope mills are near-capacity with heavy backlogs.

New York—Wire mills are covering regular trade for fourth quarter on normal requirements at unchanged prices, although formal announcement on quotations for that period has not been made.

Mills producing wire nails are firming up prices and withdrawing concessions to secondary handlers. Due to rather substantial inventories, however, jobbers are still granting concessions and little improvement is yet noted in quotations to consumers. An early correction in this situation is expected in view of the stronger demand for nails for cantonments, barracks and other temporary housing which is estimated as likely to be around 150,000 kegs. While the war department, Washington, has placed 1000 tons for delivery to various locations, bulk of the nail requirements will be bought by general contractors. These are rush projects for early housing of troops and little delay will be possible in placing orders for materials, and, for Camp Dix, New Jersey, the contractor has already bought close to 20,000 kegs.

Washington—Pittsburgh Steel Co., Pittsburgh, and American Steel & Wire Co., Cleveland, have divided contracts for 14,500 rolls barbed wire for United States army engineers for delivery at various posts. Unit prices were: Pittsburgh Steel Co., \$3.615, item one; \$3.453, item two and \$3.625, item five; American Steel & Wire Co., \$4.109, item three, and \$3.975, item four.

Pipe

Pipe Prices, Page 89

Pittsburgh—Pipe shipments thus far in September are running on a par with August totals. Prices are steady in all markets. Demand is fairly good for mechanical tubing and standard pipe. Line pipe activity is off, although oil country business generally is steady.

New York—Demand for pipe and tubular goods is expanding. With the fall season at hand, there is a better movement of plumbing and heating pipe out of warehouse and business in mechanical tubing is exceedingly active, reflecting high operations in the machinery industry.

Resale merchant steel pipe has not yet reflected firmer stand taken by mills, the latter now generally holding for listed prices. While

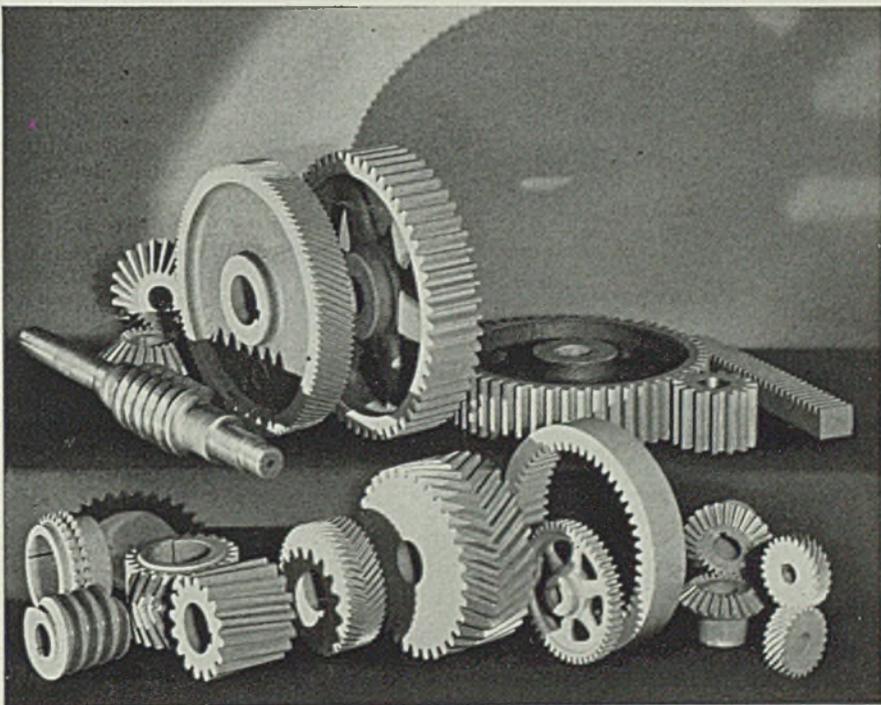
buying through secondary channels is improving with prospects for further gains likely, consigned stocks are still substantial, the total for the country being in excess of 1,000,000 tons, according to one estimate.

Boston—Merchant steel pipe demand for miscellaneous building is better, but spotty. While mills have taken a firmer stand on prices, this has not had the expected effect on resale quotations. In spots such prices are slightly stronger, but on the whole continue weak in most

districts. An increasing factor in steel pipe demand is for shipbuilding. Cast pipe releases still lag and new buying is confined mostly to small tonnages.

Birmingham, Ala.—Production was maintained last week on a five-day basis in most of the district's pipe plants. Orders, while scattered, are highly satisfactory in the aggregate.

San Francisco—Demand for larger lots of cast iron pipe has eased off and only two projects in excess of 100 tons are now pend-



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ing. Awards were limited to lots of less than 100 tons. So far this year 32,846 tons have been booked as compared with 24,466 tons in the corresponding period in 1939.

Cast Pipe Placed

380 tons, 8 to 12-inch, Bath, Me., to Warren Pipe Co., Everett, Mass.
100 tons, 6 to 8-inch, Quonset Point, R. I., to Warren Pipe Co., Everett, Mass.

Cast Pipe Pending

810 tons, 8 to 14-inch, cast iron steel, concrete or cement asbestos pipe; city

purchased welded steel pipe. 287 tons, 8-inch, San Francisco, invitation 2493; United States Pipe & Foundry Co., Burlington, N. J., low.

Rails, Cars

Track Material Prices, Page 89

Locomotives Placed

Baltimore & Ohio, seven diesel-electric passenger engines, to Electro-Motive Corp., LaGrange, Ill.
Boston & Maine, three 4-8-2 type locomotives, to Baldwin Locomotive Works,

Eddystone, Pa.; two additional locomotives were originally inquired for.

Locomotives Pending

Amtorg Trading Corp., New York, 10 0-8-2 locomotives for export to Russia, inquiry revived.
Chesapeake & Ohio, 10 2-6-6-1 steam locomotives, bids opened last week.
Southern Railways, two 600-horsepower Diesel-electric locomotives, bids opened last week.

Car Orders Placed

Pittsburgh & Lake Erie, 1000 70-ton gondolas, to Dispatch Shops Inc., Rochester, N. Y., a subsidiary of New York Central.

Car Orders Pending

Bureau of yards and docks, navy department, fifteen 50-ton flats and six 50-ton gondolas; bids Oct. 4.
Naval supply depot, Norfolk, Va., one 10,000-gallon tank car; bids Sept. 30.
Norfolk & Western, noted last week inquiring for 500 55-ton gondolas, has taken alternate bids on as many as 1000.

Rail Orders Pending

New York Central, 65,000 tons, with bids opening Sept. 30, as noted last week.

Shapes

Structural Shape Prices, Page 88

Pittsburgh—New shape tonnage is heavier, with inquiries coming from industrial expansion and public works. Tonnage directly attributable to national defense sources is increasing constantly and is directly responsible for a substantial part of current unplaced tonnage.

St. Louis—Outlook for structural steel business is improving slightly with completing of plans for a number of important industrial constructions. Some highway work is also active.

Chicago—Orders for structural shapes and plates received by the mills here in the past week were considerably heavier than in the past several weeks. The largest single award includes 1500 tons for war department buildings at Jeffer-

Shape Awards Compared

	Tons
Week ended Sept. 21.....	81,811
Week ended Sept. 14.....	42,360
Week ended Sept. 7.....	49,247
This week, 1939	24,408
Weekly average, year, 1940.	24,432
Weekly average, 1939	22,411
Weekly average, August....	29,403
Total to date, 1939	861,299
Total to date, 1940	926,408

Includes awards of 100 tons or more.



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sonville, Ind., which went to Gage Structural Steel Co., Chicago.

Boston—Structural steel for the air base at Quonset Point, R. I., continues to be placed. Orders for this project also included 4250 tons of steel piling in the past week. Meanwhile outstanding award is a 11,000-ton bridge at Hartford. Fabricated structural steel for this project is estimated at 6500 tons.

New York—American Bridge Co., Pittsburgh, is low on nearly 15,000 tons of structural steel for two sections of the Brooklyn elevated parkway, combination of contracts 18-B and 20-B, work being on Hamilton and Third avenues, Brooklyn. Bids closed Sept. 17.

Active structural requirements pending for bridges and public work are heavier. This, with construction linked to the defense program, assure heavy awards during the next two weeks. Current contracts are more numerous.

Philadelphia—Structural requirements in connection with the defense program are rising steadily. New work includes a gun assembly plant at Washington involving 3500 tons. Awards are topped by 13,500 tons of H-piling for navy drydocks here and at Norfolk. Shape deliveries are becoming more extended, some mills now being able to do little better than eight weeks. Prices on fabricated material are firmer, although some concessions still are noted.

Seattle—Heavy tonnages for shipbuilding will be required by public and private yards in the Pacific Northwest, several important construction contracts having been placed recently. Twenty-six destroyers recently were awarded to local yards. Lake Washington Shipyards, Seattle, is low for a 229-foot coast and geodetic survey vessel, involving nearly 1000 tons. Business pending includes 1400 tons for the Bonnevill power house foundations, bids in.

Shape Contracts Placed

14,000 tons, elevated parkway, Hamilton avenue and Third avenue, Brooklyn contracts B18-B20, Triborough Bridge Authority, New York, to American Bridge Co., Pittsburgh, bids Sept. 17.

7500 tons, tank plant, Chrysler Corp., Centerline, Mich., to Bethlehem Steel Co., Bethlehem, Pa.

7500 tons, H-piling, drydock, navy yard, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa., through Drydock Associates Inc., Philadelphia.

6700 tons, bridge, Connecticut river, Hartford, Conn., to American Bridge Co., Pittsburgh, bids Sept. 17, state highway commission, Hartford.

6000 tons, fabricated trusses, drydocks at Norfolk and Philadelphia navy yards, to Virginia Bridge Co., Roanoke, Va., and Bethlehem Steel Co., Bethlehem, Pa., through Drydock Associates.

6000 tons, H-piling, drydock, navy yard, Norfolk, Va., to Carnegie-Illinois Steel

Corp., Pittsburgh, through Drydock Associates Inc., Norfolk, Va.

4250 tons, piling, naval air station, Quonset Point, R. I., split between Carnegie-Illinois Steel Corp., Pittsburgh, and Bethlehem Steel Co.; Merritt-Chapman & Scott Corp. and George A. Fuller Co., New York, joint contractors.

2300 tons, storage warehouses, quartermasters depot, Jeffersonville, Ind., to Gage Structural Steel Co., Chicago; George H. Rommel Co., Louisville, Ky., contractor.

2200 tons, ship repair vessels for naval department, to Los Angeles Shipbuilding Co., Los Angeles.

1400 tons, barracks, naval air station, Quonset Point, R. I., to Harris Structural Steel Co., New York, through

Merritt-Chapman & Scott Corp. and George A. Fuller Co., New York, joint contractors.

1170 tons, bridge, Rappahannock river, Fredericksburg, Va., to Virginia Bridge Co., Roanoke.

1150 tons, building, quartermaster department, Twenty-First and Johnson, Philadelphia, to Belmont Iron Works, Philadelphia, through Wark & Co., Philadelphia.

1000 tons, additions to plant, for Diesel Engine division, General Motors Corp., Cleveland, to Austin Co., Cleveland.

1000 tons, 18-story apartment, Park avenue and 61st street, New York, to Harris Structural Steel Co., New York.

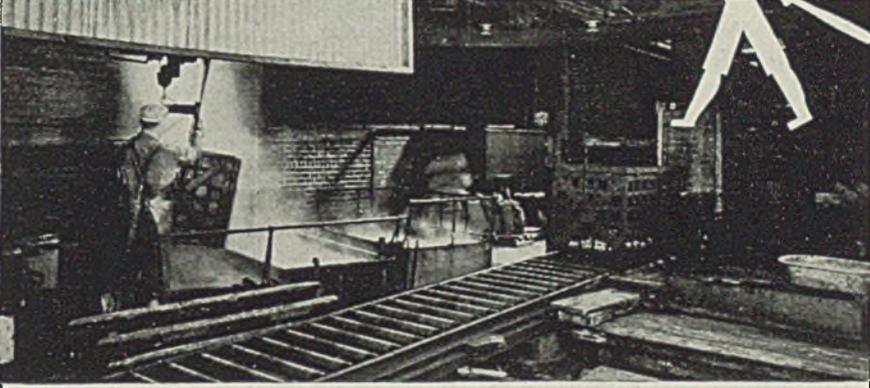
900 tons, shop buildings, lamp division,

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for pickling crates:

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YOUNGSTOWN—to bat 1000 on design!



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Monel is a great metal for pickling equipment. It's highly corrosion resistant, leaves no copper flash. It's durable and rugged, minimizing repairs and replacements. It makes very strong, light-weight crates.

But to make sure of getting the most efficient, the most satisfactory Monel crates for your own plant, this metal's properties should be coupled with sound engineering design. That's what we're strong on—for we've designed all sorts and sizes of crates for the leaders of the steel industry for a number of years. We have the welders, the machinists, the engineers to produce crates, from our designs or your own, promptly and economically . . . Why not get a quotation on YOUNGSTOWN Monel crates for your own pickling department? They would certainly pay dividends for years to come.

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Behind the Scenes with STEEL

Baseball Blitz

■ With the Detroit Tigers and the Cleveland Indians fighting each other tooth and nail in the hectic American League race, the sports writers have aptly taken a hint from the war correspondents in heading their daily stories. "Communiques" from the "front" this last week told of the awaited invasion of the Motor City by the hardpounding Indians, and of the terrific bombardment Detroit took from the Phillies. The Yankees have sued for peace and the Cincinnati Reds play the role of a belligerent neutral waiting for the opportune time to start the total war, which may be Ohio's first Civil War.

Rain of Death

■ *Notes on the Progress of Man:* In a few minutes today, 50 German bombers will drop as many bombs on London as were dropped on all of England during the First World War in 103 different raids.

Baby Care

■ A classified adv. in *The Foundry* offering a small Michigan gray iron plant for sale, reminds us of a call we made up there a couple of years ago. We were there pretty early in the morning, before anyone had shown up except about two dozen cats that literally swarmed all over the place. After a while the boss ambled by and opened up as we chewed the fat about this and that. Pretty soon one of his neighbor friends came along with a cute little baby plopped over his shoulder and joined in the conversation which shifted to the proper care of infants. "Say, Joe," the neighbor says, "It's about time the little punkin here gets weighed again," so the boss grabs a bench out of the corner, weighs it on one of those big foundry floor scales, sits the baby on the bench and quick calculates she's up two pounds. As we left we

inquired casually about all the cats. The boss just looked around and said, "Rats."

Parting Orchid

■ After someone once begins to read STEEL it gets to be a habit that's hard to break. We don't claim to be "indispensable" like the present occupant of 1600 Pennsylvania Ave., N. W., Washington, D. C. (telephone National 1414) but we have been with thousands of our readers for far more than three terms. So when we must part with such an ardent reader as G. O. Marrs of Denver, we simply say *au revoir* and not goodbye. He writes: *I am going into another field altogether and must discontinue STEEL, but this is not due to any lack of merit, for I consider STEEL very excellent—in fact above anything else in the field.*

Radio Highlight

■ If you want to hear some entertaining and most interesting propaganda tune in on the *Radio News Reel* relayed direct from the British Broadcasting System by CLW, Toronto at 9:30 EST. It comes in at 820 kilocycles and you will hear the most vivid picture of London raids and British determination that is on the air.

Mystery Series

■ If you see anyone around your office masquerading in that Sherlock Holmes paraphernalia on page 15 (Phillips Screw) he's probably stealthily moving in on page 55 (Crane Co.) to solve the Case of the Burned Beef Stew.

Windy City Bound

■ Convention time is here and we're going to run out to Chicago this week and peek around the Stevens Hotel to see what the Iron and Steel Engineers are up to. We'll give you a worm's eye view next week.

SHRDLU.

—The Market Week—

- General Electric Co., Jackson, Miss., to Pidgeon-Thomas Iron Co., Inc., Memphis, Tenn.; M. T. Reed Construction Co., Jackson, contractor.
- 895 tons, bridge, Neches river, Beaumont, Tex., to Kansas City Structural Steel Co., Kansas City, Mo.
- 895 tons, plant addition, New Jersey Zinc Co., Depew, Ill., to Milwaukee Bridge Co., Milwaukee.
- 750 tons, melt loading assembly line, ordnance depot, Savannah, Ill., to Case Structural Steel Co., Chicago; Hagstrom Construction Co., St. Paul, contractor; reinforcing bars to Bethlehem Steel Co., Bethlehem, Pa.
- 725 tons, Goss Printing Press Co. to Wendnagel & Co.
- 720 tons, state bridge 534 over Boston road, Bronx, New York, to American Bridge Co., Pittsburgh.
- 690 tons, foundry building, Wright Aeronautical Co., Paterson, N. J., to Truscott Steel Co., Youngstown, O.
- 685 tons, bridge, route 124, Boston Post road, Bronx, N. Y., to American Bridge Co., Pittsburgh; J. Leopold & Co., New York, contractor.
- 650 tons, bridge, Pittsford, N. Y., to American Bridge Co., Pittsburgh, through E. W. Foley Inc., Brooklyn, N. Y.
- 625 tons, state highway bridge, contractor, Mosher Steel Co., Fowlerston, Texas, to Bethlehem Steel Co.
- 550 tons, addition, Stamford Rolling Mills Co., Stamford, Conn., to Lehigh Structural Steel Co., Allentown, Pa., through F. D. Rich Construction Co., Stamford.
- 450 tons, American Car & Foundry Co., paint shop building, to Superior Structural Steel Co., St. Louis.
- 435 tons, aircraft, paint and oil warehouses, naval air station, Quonset Point, R. I., to Belmont Iron Works, Eddystone, Pa.; Merritt-Chapman & Scott Corp. and George A. Fuller Co., New York, joint contractors.
- 425 tons, shipping-storage building, Warren Telechron Co., Ashland, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; J. W. Bishop Co., Providence, R. I., contractor.
- 375 tons, overpass, Evans, Pa., for state, to Fort Pitt Bridge Works, Pittsburgh.
- 375 tons, steel piling, naval air training base, Flour City, Texas, to Bethlehem Steel Co.
- 365 tons, service shop and warehouse, for General Electric Co., Pittsburgh, to Ingalls Iron Works, Birmingham.
- 360 tons, plant addition, American Viscose Corp., Nitro, Va., to Lehigh Structural Steel Co., Allentown, Pa.
- 355 tons, machine shop addition, Irvine, Pa., to Rogers Structural Steel Co., Corry, Pa.
- 350 tons, Fuller elementary school, Chicago, to Reuter Bros. Iron Works, Chicago.
- 340 tons, addition to engineering building, Vought-Sikorsky division, United Aircraft Corp., Stratford, Conn., to Bethlehem Fabricators, Bethlehem, Pa.
- 330 tons, army medical school buildings, Carlisle, Pa., to Weatherly Steel Co., Weatherly, Pa.
- 325 tons, office and boiler house, Jacobs Mfg. Co., West Hartford, Conn., to Lehigh Structural Steel Co., Allentown, Pa.
- 300 tons, factory-office building, Taylorcraft Aviation Corp., Alliance, O., to R. C. Mahon Co., Detroit.
- 300 tons, piling, Brown & Root Inc., contractor, Corpus Christi, Texas, to Bethlehem Steel Co.
- 290 tons, crest gates and bulkhead, Loy-alhanna dam, Saltsburg, Pa., for army

< < HELPFUL LITERATURE > >

1. Flexible Couplings

Ajax Flexible Coupling Co.—16-page illustrated data book gives complete tabulated information on horsepower and torque ratings of flexible couplings. Dimensional specifications on forged steel and cast iron couplings including conventional and shear pin types are presented.

2. Steel Strapping

Acme Steel Co.—8-page illustrated bulletin No. AD-18 indicates what manufacturers have accomplished with low-cost, non-returnable steel-strapped wooden skids. Trend in handling practices is discussed. Skid-Load process in handling is explained.

3. Grinding Wheels

Abrasive Co.—112-page illustrated book No. ESA5-23 discusses and explains types, sizes and grades of cutting particles, types of bonding mediums, method of manufacture, internal grinding, safety code, operating rules. Tables of grinding wheel speeds, work speed, and decimal equivalents are included.

4. Fire Extinguishers

Walter Kidde & Co.—8-page illustrated bulletin No. Z-508 shows adaptation of fixed carbon dioxide extinguishing systems to various industrial hazards. Installation diagrams on mixers, storage tanks, dip tanks and generators, and engineering drawings of door and window closing devices are included.

5. Mercury Vapor Lamp

General Electric Co.—6-page illustrated folder No. Y-0224 explains why mercury "Mazda H" and filament "Mazda C" lamps supplement each other to give off a cool daylight color. Advantages of mercury lamps for industrial high bay lighting are presented, and essential lamp specifications are given.

6. Metal Finish

Alrose Chemical Co.—6-page illustrated bulletin describes the Jetal process, a method of uniformly blackening iron and steel which provides paint base, an attractive finish and a rust-resistant coat. Why process hardens surface but does not chip, scale, peel or discolor is explained.

7. Dust Disposal Unit

American Foundry Equipment Co.—11-illustrated circular No. 52 describes the new American wet disposal unit for dry type dust collectors. This unit is designed for wetting and mixing with water or other liquids the collected dust discharged from hoppers of cloth filter or other dry types of collectors.

8. Recording Meters

Bristol Co.—illustrated bulletin No. 543 is descriptive of round-chart recording voltmeters and ammeters and shows more common applications. Various models for wall and flush panel mounting, as well as portable units built to withstand transportation and with weatherproof case, are described.

9. Centerless Lapping

Cincinnati Grinders, Inc.—12-page illustrated bulletin No. G-453 covers details of centerless lapping machines. Advantages of centerless lapping are outlined, available machines and equipment are described, and complete specifications on equipment are included.

10. Adsorptive Dryers

C. M. Kemp Manufacturing Co.—8-page illustrated bulletin, "Adsorptive Dryers," describes complete line of equipment for removing moisture from gases, liquids and solids. Operation cycle is given for both adsorption and activation with this dryer.

11. Machine Tools

Hardinge Brothers, Inc.—8-page illustrated Golden Anniversary bulletin is presentation of line of fully-enclosed precision machine tools, including tool room lathe, milling machine, precision lathe, second operation machine, and high speed milling machines with horizontal and vertical headstocks.

12. Insulated Cable

Okonite Co.—16-page illustrated bulletin No. OK-209 discusses Okoprene cable which requires no tapes or braids over insulation. Features of additional insulation, moisture, oil, heat and cold resistance, and longitudinal surface resistance are discussed. Chart of recommended thicknesses is added.

13. Maintenance Tools

Ideal Commutator Dresser Co.—12-page illustrated broadside, "Greater Savings," describes complete line of products. Included are automatic motor base, variable speed transmission, electric cleaner, electric soldering tools, wire strippers, commutator tools, electric markers, fuse clip clamps, coil winding equipment, and motor maintenance equipment.

14. Steam Traps

W. H. Nicholson & Co.—18-page illustrated bulletin No. 240 includes price lists, discussion of construction, capacity tables, applications and distinguishing features of industrial steam, expansion steam, weight operated and piston operated traps.

15. Speed Reducers

D. O. James Manufacturing Co.—28-page catalog and price list No. 17 gives engineering data, dimensions, weights, prices and selection guidance on line of motorized speed reducers for practically all types of drives. Specifications on flexible and universal couplings are included.

16. Adult Education

International Correspondence Schools—6-page illustrated folder No. 8378 gives brief resume of ICS teaching methods, relates story of I. C. S. and its alumni, and tells importance of specialized instruction in overcoming skilled labor shortage.

17. Metal Turning

Gisholt Machine Co.—illustrated performance data sheets Nos. 54 to 57 include case studies in metal turning using automatic and turret lathes, and a typical example of static-dynamic balancing on a "Dynetric" balancing machine.

18. Stainless Steel

Republic Steel Corp.—28-page illustrated booklet No. ADV 361 is entitled "Republic Enduro Stainless and Heat-resisting Steels." General in nature, this bulletin describes the properties and applications of Enduro in many fields of industry.

19. Alloy Cast Iron

Ferrous Metal Corp.—10 page illustrated bulletin, "Z-Metals" presents physical and mechanical properties of this ductile alloy cast iron. Subjects covered include commercial applications, composition, corrosion resistance, and production methods using "Z-Metals."

20. Drill Press

Buffalo Forge Co.—12-page illustrated bulletin No. 2989-D gives specifications, capacities, features, and available special equipment of No. 22 round or column type drill which has large size hole capacity and yet handles fast and smoothly.

21. Bearing Data

Johnson Bronze Co.—Three illustrated data sheets, "Controlled Lubrication," "Bearing Loads," and "Press Fit Close-In," are part of a series of data sheets dealing with properties and applications of "Ledaloy!" self-lubricating bearings.

22. Magnetic Disk Brakes

Stearns Magnetic Mfg. Co.—12-page illustrated bulletin No. 604 treats comprehensively magnetic disk brakes and includes specifications, formulas, installation views and description of this equipment.

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23. Vertical Pumps

Fairbanks, Morse & Co.—6-page illustrated bulletin No. 6860 points out features of mixed flow vertical propeller pumps which may be arranged for electric motor, diesel, or gasoline engine drive. Need for portable, self-contained pumps for large capacity, moderate head pumping units is explained. Installation photographs are included.

24. Friction Tape

Graybar Electric Co.—16-page illustrated booklet, "What to Look For and Why," gives importance of such factors as appearance, pinholes, strength, adhesion, and full yardage in the selection of friction and rubber tape. Available tapes are described.

25. Air Compressors

Curtis Pneumatic Machinery Co.—4-page illustrated bulletin No. C-65 describes single and two stage, single cylinder and duplex air compressors which are Timken bearing equipped and feature positive lubrication, and hand or centrifugal unloading.

26. V-Belt Drives

Allen-Chalmers Mfg. Co.—16-page illustrated bulletin No. B-8261-A gives data for estimating costs, types and sizes of V-belt drives. Latest horsepower ratings are included and information on Texrope belts, Texsteel, Texdrive and regular cast iron sheaves is presented.

27. Refractory Products

Atlas Lignite Cement Co.—24-page illustrated bulletin gives methods of making refractory concrete for low, medium and high temperature furnaces. Heat resistant concrete for construction of flues and ducts, foundations and floors is described.

28. Floor Resurfacer

Flextrock Co.—4-page illustrated bulletin tells how Chrysofile makes tougher feather edges and body in Ruggedwear, a firm, smooth floor resurfacer. Applications for industrial repair work are shown. Instructions for use are complete.

29. Press Brakes

Verson Allied Press Co.—6-page illustrated bulletin No. JPS-80 presents specifications and data on "Verson" junior press brakes for forming, bending, cupping, notching, and multiple punching operations at speeds up to 40 strokes per minute.

30. Pulleys

Speedmaster Co.—4-page illustrated data sheet No. D-3002 gives shipping data, belt installation, speed adjustment, motor mounting and specification details on various types of pulleys. Construction and operation details are featured.

HELPFUL LITERATURE

(Continued)

31. Speed Increase

Westinghouse Electric & Mfg. Co.—24-page illustrated booklet No. 3650 describes type SII speed increasers designed to supply output speeds not usually obtained safely from common prime movers. Presents dimension information, ordering instructions, pictures of successful applications and flow diagrams.

32. Refractory Cement

A. P. Green Fire Brick Co.—4-page illustrated bulletin P-87 gives features of air-setting high temperature bonding mortar called Salsret which bonds fire brick together with thin, gas and air tight joints and maintains its strength when heated to furnace temperatures. Shows typical installations.

33. Welder Cable

Clark Controller Co.—6-page illustrated bulletin No. 7777 discusses advantages of "Klockless Cable," for water-cooled electrical connection between the secondary taps of welder transformer and portable welder gun. How current savings are possible.

34. Lubrication System

Farral Corp.—4-page illustrated bulletin No. 10-A explains high pressure, centralized system of lubrication called the Duxline Jr., made for needs of smaller machine tools and equipment. Its use of central pumping unit, two main supply lines and automatic measuring valve at each bearing is discussed.

35. Liquid Level Meters

Cochrane Corp.—6-page illustrated bulletin No. 2899 covers six different types of mechanically and electrically operated liquid level meters. Application drawings and technical data on four electric operated types designed for remote service are presented.

36. Pre-Finished Metal

American Nickeloid Co.—Five illustrated broadsides deal with the economy of pre-finished metals. Application to many types of products of bright nickel brass, bonded nickel steel and other pre-finished metals, available in coils, plain and corrugated sheets, and strips, are shown.

37. Tubing Fittings

Farker Appliance Co.—26 inch illustrated wall chart presents complete dimensional and engineering details of available triple tube couplings, standard tube couplings, and combination and reducing fittings, available in brass, cast bronze, aluminum alloy, carbon steel, stainless steel, nickel steel and copper silicon alloy. Chart aids selection of proper fitting.

38. Whiteprint Machine

Qualid Corp.—Describes Model F printer-developer whiteprint machine that accommodates materials up to 42 in. wide and has a maximum printing speed of 56 in. per min. How printer and dry developer combine in one unit is explained.

39. Monel

International Nickel Co.—16-page illustrated bulletin T-9 gives complete technical information and engineering properties of "IN" Monel. Composition, physical constants, properties, working instructions, heat treatment, corrosion resistance, mill products, and applications are some of subjects covered.

40. Pyrometers

Leeds & Northrup Co.—12-page illustrated broadside No. N-33 describes instruments for use with thermocouples, Rayotubes and Thermohms. All types of pyrometers from hand-operated temperature indicators to automatic control equipment for complicated regulating jobs are included.

41. Hydraulic Presses

Clearing Machine Corp.—24-page illustrated bulletin presents applications, operating advantages, design and construction, capacities and sizes of various hydraulic precision presses including 25-ton, 500-ton 1500-ton, 4-column, 1250-ton special purpose, hydraulic die spotting, and other presses.

42. Abrasives

Sterling Grinding Wheel Co.—32-page illustrated bulletin, "Sterling Abrasives," gives factual information on some of the many grinding wheels and abrasives commonly used in industry. Operations covered include centerless, crankshaft, high speed snagging, and tool room grinding. Also described are cut-off, surface grinding and polishing wheels, sticks and bricks.

43. Motor Controls

Collier-Hammer, Inc.—22-page illustrated bulletin CS-150 tells history of engineering progress in motor control together with historically interesting pictures of progress of other mechanical inventions. Discusses eclectic alloy overload relay and briefly describes other available motor control units.

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—The Market Week—

engineers, to American Bridge Co., Pittsburgh.

290 tons, die storage building, Pratt & Whitney division, United Aircraft Corp., Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

280 tons, factory building, Goodman Mfg. Co., Chicago, to American Bridge Co., Pittsburgh.

225 tons, grade crossing elimination, Dunkirk, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Bero Engineering & Construction Corp., North Tonawanda, N. Y., contractor.

220 tons, warehouse and office building, for Sprague-Warner & Co., Chicago, to Wendnagel & Co., Chicago.

220 tons, photographic and clerical school buildings, Lowry Field, Colorado, to Denver Steel & Iron Co., Denver; F. J. Kirchoff, Denver, contractor.

220 tons, addition, school 29, Staten Island, N. Y., to Bethlehem Fabricators, Inc., Bethlehem, Pa.; Jonwall Construction Co., New York, contractor.

215 tons, Letshe elementary school, Pittsburgh, to Guilbert Steel Co., Pittsburgh.

215 tons, hangar, for Roscoe Turner Aeronautical Corp., Indianapolis, Ind., to Central States Bridge & Structural Co., Indianapolis.

210 tons, public school 39, Richmond, Staten Island, New York, to Bethlehem Fabricators, Bethlehem, Pa.

205 tons, 391-foot viaduct, Hastings, Nebr., to Pittsburgh-Des Moines Steel Co., Des Moines, Ia.

200 tons, state highway bridge, Dunkirk, N. Y., to the Bethlehem Steel Co., Buffalo, Border Building Co., Buffalo general contractor.

200 tons, bridge 325, Naismith, Mont., for Great Northern railway, to American Bridge Co., Pittsburgh.

190 tons, factory and office building, for Eaton Mfg. Co. Cleveland, to Burger Iron Co., Akron, O.

180 tons, factory and office building, for Johnson Metal Products Co., Erie, Pa., to Rogers Structural Steel Co., Conry, Pa.

175 tons, factory building 43B, American Cyanamid Co., Pearl River, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

170 tons, plant addition, Walker Bros., Coatswoboken, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, bakery and laundry buildings, Mt. Hope, C. Z., to U. S. Steel Export Corp., New York; McCarthy Bros., St. Louis, contractor.

160 tons, shops and bars, laundry and bakery building, General, C. Z., to U. S. Steel Export Co., New York; Newy & Lattrell, Assen, C. Z., contractors.

155 tons, overpass, Eaton Valley, Pa., for state, to Bethlehem Steel Corp., Bethlehem, Pa.

152 tons, storage building and plant addition, Stearman Aircraft Corp., Wichita, Kan., to George C. Christopher & Son Iron Works, Wichita; Walter Armstrong, Wichita, contractor.

150 tons, piling, state bridge, Spokane, Wash., to Bethlehem Steel Co., Seattle.

150 tons, mirror plant, Chocomaed, to Indiana Bridge Co., Inc., Muncie, Ind.

150 tons, bridge SP-649, Dunn county, Wisconsin, to Illinois Steel Bridge Co., Jacksonville, Ill.

140 tons, bridge, Beaver county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa., through Central Pennsylvania Quarry & Shipping Co., Scrubury, Pa.

138 tons, piling, gravel, Rhineland, Wis., contractor, E. G. Arnold.

135 tons, including plates, navy lighter, to Pacific Car & Foundry, Seattle.

125 tons, power house, U. S. Tobacco Co., Chicago, to Eggers Iron Co., Chicago.

125 tons, highway bridge, Greene county, Ohio, to Burger Iron Co., Akron, O.

125 tons, bridge FAGS-50, Davidson county, Tennessee, to Nashville Bridge Co., Nashville.

125 tons, crane beams, for Newport News Shipbuilding & Dry Dock Co., Newport News, Va., to Bethlehem Steel Co., Bethlehem, Pa.

117 tons, piling, Michigan state highway bridge, Muskegon river, Mich., contractor, L. W. Lamb.

115 tons, highway bridge, for Franklin county, Columbus, O., to O. W. Merrill Supply Co.

114 tons, state highway project RC-40-61, Chemung county, New York, to

Lackawanna Steel Construction Co., Buffalo; bars to Bethlehem Steel Co., Bethlehem, Pa.; Maple City Lumber & Supply Co., Sayre, Pa., contractor.

110 tons, shoring and beams, Fort Peck, Mont., to Des Moines Steel Co., Des Moines, Ia.

110 tons, bridge FAP-117 (2)-1941, Big Piney, Wyo., to Des Moines Steel Co., Des Moines, Ia.

110 tons, hangar and buildings, for Aeronautical Corp. of America, Middletown, O., to Burger Iron Co., Akron, O.

100 tons, state highway bridge, grade crossing, PSC-5984, Broome county, New York, to American Bridge Co., Pittsburgh; Harrison & Harroves, Inc., Jersey City, N. J., contractor.



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WITH NICKEL,
ZINC, COPPER,
BRASS, BRONZE

THE THOMAS STEEL CO.
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL
WARREN, OHIO

Shape Contracts Pending

20,000 tons, overhead runways, drydocks, Norfolk and Philadelphia navy yards; taking bids.

15,000 tons, viaduct, grade crossing elimination, contract 5, Long Island railroad, Rockaway Beach, N. Y.; bids Sept. 26.

11,500 tons, Connecticut river bridge, Hartford, Conn.; American Bridge Co., Pittsburgh, low.

5000 tons, grade elimination, section 5, contract 4, Long Island railroad, Atlantic avenue, Brooklyn; Arthur A. Johnson Corp., New York, low, bids Sept. 17.

4000 tons, engineering shop, invitation 6812-41-17, Hickam Field, T. H.; bids opened.

3500 tons, addition, gun assembly shop, navy yard, Washington; Skolnick Building Corp., New York, low, bids Sept. 18, Washington.

3400 tons, powder plant, Charleston, Ind., for E. I. du Pont de Nemours & Co., Wilmington, Del.

3200 tons, extension to shops, for bureau of yards and docks, Washington.

2800 tons, floating drydock, Pacific coast, navy; Dravo Corp., Pittsburgh, low.

2500 tons, shop buildings, Brumman Aviation Corp., Bethpage, N. Y. Austin Co., contractor; bids in.

2000 tons, ten seaplane tenders for navy on West Coast; bids Sept. 25.

1500 tons, assembly and repair shop, Quonset Point, R. I., for navy.

1400 tons, mineral industrial building, for West Virginia university, Morgantown, W. Va.

1100 tons, addition to warehouse, for Westinghouse Electric & Mfg. Co., Mansfield, O.

1100 tons, steam power plant, Watts Bar dam, Tennessee, for Tennessee Valley authority.

1000 tons, bridge, Connecticut river, Hartford, Conn.; A. I. Savin Construction Co., East Hartford, low.

1000 tons, bridge, Los Angeles Junction railroad bridge, Vernon, Calif.; bids about Sept. 20 by United States Engineer office, Los Angeles.

1000 tons or more, including plates, 229-foot survey vessel for C. & G. Survey; Lake Washington Shipyards, Seattle, low.

905 tons, structural steel spillway gate rail support towers, Kentucky dam; bids Sept. 25, Tennessee Valley authority, Knoxville, Tenn.

900 tons, double hangar, Hickam Field, T. H., invitation 6812-41-14; bids Oct. 1.

750 tons, post office garage, Boston, for government.

750 tons, six Missouri state highway bridges, bids Sept. 27.

700 tons, Felix Fuld Courts, New Jersey housing project NJ 2-8; bids again postponed to Sept. 26.

700 tons, air base, San Juan, P. R.; Arundel Corp. Consolidated Engineering Co., Baltimore, joint contractors.

625 tons, factory addition, for Bendix Aviation Corp., Sidney, N. Y.

600 tons, coal handling material, for Commonwealth Edison Co., Chicago.

550 tons, housing project, New Britain, Conn.; Rathgeb-Walsh, Inc., Port Chester, N. Y., low.

500 tons, state highway bridges, New York, Oct. 2, Albany.

500 tons, housing project, Jersey City, N. J.; George Siegler, Jersey City, low, \$1,299,000.

475 tons, printing department building, for Westinghouse Electric & Mfg. Co., Trafford, Pa.

400 tons, six Illinois state highway bridges, bids Sept. 20.

375 tons, annexes, warehouse buildings, Patterson field, Dayton, O., for government.

375 tons, shipways, navy yard, Portsmouth, N. H., Aberthaw Co., Boston, contractor.

365 tons, factory building, for Curtis Lighting Co., Paducah, Ky.

275 tons, Illinois state highway bridge, Hillview, Ill.; bids to close Sept. 20.

258 tons, Y. W. C. A., Harrisburg, Pa.; bids in.

240 tons, tunnel supports, Duchesne tunnel, Provo river project, Utah; general contract to Utah Construction Co., Box 187, Ogden, Utah, at \$727,575.

230 tons, addition to acid recovery building, for American Viscose Corp., Nitro, W. Va.

220 tons, bridges, for Illinois Central railroad, Council Hill, Ill.

200 tons, fair grounds grand stand, Wausau, Wis.

190 tons, bridges, Atchison and Sherwin, Kans., for Missouri Pacific railroad.

180 tons, state bridge, Wilkes-Barre, Pa., for state.

175 tons, state bridge, Canaan-Enfield, N. H.

165 tons, dispensary building, New London, Conn., for government.

165 tons, including piling, bridge, Canaan-Enfield, N. H.; bids in.

160 tons, rebuilding bridge 59, Bellingham, Wash., for Great Northern railway.

140 tons, state bridge over Huron river, Huron county, Ohio.

120 tons, addition to boiler house, for American Viscose Corp., Nitro, W. Va.

115 tons, bridge, route 29, section 2D, Union county, New Jersey; bids Oct. 4, E. Donald Sterner, state highway commissioner, Trenton.

110 tons, two theatres for war department, Rantoul, Ill.; bids Sept. 24.

108 tons, three plate girder bridges near Harriman, Tenn., Tennessee Valley Authority, bids Oct. 7, Knoxville.

100 tons, shapes and bars, grade crossing elimination West Berlin, N. J.; bids Oct. 4, E. Donald Sterner, state highway commissioner, Trenton.

Unstated, girders and platforms, etc. for Coulee dam; bids of Denver, Oct. 2, Spec. 1434-D.

Unstated, two large sluice gates for Puget Sound navy yard, bids Sept. 30, Spec. 206 NSA.

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CHICAGO, ILL.

Tin Plate

Tin Plate Prices, Page 88

Pittsburgh—Producers in the district report little or no change in the situation. Shipments continue to run better than production, with the result that stocks are declining slowly. Production is estimated at 40 per cent, off four points from last week. General line business is slightly better, but specifications on pack-

ers' cans are dwindling. Export business is fair, with some sign of increases in the near future.

Reinforcing

Reinforcing Bar Prices, Page 89

Pittsburgh—Unplaced tonnage is now at the highest point of the year and in all probability will remain high until the weather cuts down on construction activity. Prices are reported steady in all sections, although there is a tendency toward weakness in eastern sections. Shipments over the past week were slightly less than placements, although most producers report deliveries are being met on time and there is no apparent jam on this product.

Chicago — The building season shows signs of tapering off as autumn approaches, one sign being the paucity of concrete bar awards and the decreasing list of prospective jobs.

New York—Led by 1120 tons, reinforcing bar lettings are heavier, but new work and requirements bid, but still pending, are mounting ahead of current buying. Bridge and viaduct needs are more active and the federal housing program is bringing out tonnage at an accelerated rate, bids being in on such projects at Jersey City and New Britain, Conn. For work held by one contractor at Coco Solo, C. Z., 10,000 tons may be required. Concrete bar prices are firmer, but pressure by contractor-buyers continues even on some cost-plus-fee contracts.

Philadelphia—Concrete bar business is heavier but lacks the volume prevailing in structural shapes. Bids have been opened on the general contract for the Poplar street housing project here, taking 3000 tons of reinforcing.

Reinforcing Steel Awards

1120 tons, sewage plant, contract 9, Bowery Bay, Queens, N. Y. to Carroll-

Concrete Bars Compared

	Tons
Week ended Sept. 21.....	9,897
Week ended Sept. 14.....	9,963
Week ended Sept. 7.....	3,910
This week, 1939	7,676
Weekly average, year, 1940.	9,139
Weekly average, 1939.....	9,197
Weekly average, August... 14,186	
Total to date, 1939	366,271
Total to date, 1940	347,268

Includes awards of 100 tons or more.

- McCreary & Co., Inc., Brooklyn; Caye Construction Co., New York, contractor.
- 600 tons, storage warehouses, quartermasters depot, Jeffersonville, Ind., to American Builders Supply Co., Louisville, Ky.; George H. Rommel Co., Louisville, contractor.
- 600 tons, mesh, highway project, RC40-76, Albany county, New York, to Truscon Steel Co., Youngstown, O.; through Arute Bros. Inc., New Britain, Conn.
- 580 tons, photographic and clerical school buildings, Lowry Field, Colorado, to Colorado Builders Supply Co., Denver; F. J. Kirchhof, Denver, contractor.
- 550 tons, Western Electric & Mfg. Co. warehouse, Mansfield, O., to Bethlehem Steel Co., Bethlehem, Pa.
- 480 tons, ordnance depot buildings, Savannah, Ill., to Bethlehem Steel Co., Hagerstrom Construction Co., contractor.
- 400 tons, reinforced paving and drainage, runway No. 1, Lowry field, Colorado, to Sheffield Steel Co., Kansas City, Mo.; J. B. Bertrand & Peter Klewitt & Sons Co., Denver, contractors.
- 400 tons, additional buildings, state school for mental defectives, Willowbrook, Staten Island, N. Y., to Capital Steel Co., New York; Weinstein & Rublin, New York, contractors.
- 350 tons, foundry building Wright Aeronautical Corp., Paterson, N. J., to Truscon Steel Co., Youngstown, O.
- 350 tons, estimated, Lincoln Heights housing project, Tex. 6-5, San Antonio, Tex., to Ceco Steel Products Co., Omaha; H. B. Kilstofte, Winona, Minn., contractor.
- 315 tons, bridge, Belt parkway, Tribor-

- ough Bridge authority project, Brooklyn, to Igoe Bros., Newark; Mill Basin Asphalt Co., New York, contractor.
- 300 tons, Scott County Milling Co., Sikeston, Mo., to Laclède Steel Co.
- 300 tons, administration building and storehouse, Panama canal zone to Joseph T. Ryerson & Son, Hageman-Harris Co., contractor.
- 300 tons, building, quartermaster department, Twenty-First and Johnson, Philadelphia, divided equally between Truscon Steel Co., Youngstown, O., and Taylor-Davis Co., Philadelphia.
- 280 tons, Commonwealth Edison Co., intake crib and tunnels, Chicago, Ill., to Inland Steel Co., Geo. A. Fuller, Contractor.
- 275 tons, grain elevator, Hutchinson, Kans., to Sheffield Steel Corp.
- 240 tons, Bay Chester bridge, New York, New Haven & Hartford railroad, to Concrete Steel Co., Boston; Marlan Construction Co., New Haven, general contractor.
- 220 tons, hospital and barracks, CMQ 6708-41-2, Canal zone to Truscon Steel Co., McCarthy Bros. Construction Co., contractor.
- 200 tons, factory building for Dixie-Vortex Co., Chicago, to Ryerson division, Inland Steel Co.
- 200 tons, Mt. Calvary housing project, Columbus, to Pollak Steel Co., H. M. Boyjohn, contractor.
- 175 tons, shop buildings, lamp division, General Electric Co., Jackson, Miss., to Contractors' Materials Co., Jackson; M. T. Reed Construction Co., Jackson, contractor.
- 166 tons, irrigation project, Boise, Idaho,



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- to unnamed interest
- 153 tons, state highway project FH-40-2, Schaghticoke village, N. Y., to Albany Steel & Iron Supply Co., Albany, N. Y.; Frank E. Adolick, Schaghticoke, contractor.
- 150 tons, food control wall, Ware, Mass., to Joseph T. Ryerson & Son, Inc., Cambridge, Mass.; Warner Bros. & Goodwin, Sunderland, Mass., contractor.
- 130 tons, Dale Homes housing, Portsmouth, Va., to Truscon Steel Co., Wm. Huirhead Co., contractor.
- 130 tons, Employes Mutual Life Insurance Co. building, Wausau, Wis., to Bethlehem Steel Co., Bethlehem, Pa.
- 122 tons, flood control project, Couer d' Alene, Idaho, to unnamed interest.
- 111 tons, pumping plant, Sauvie Island

- Drainage district, Columbia county, Ore., to unnamed interest.
- 100 tons, state bridge, Spokane, Wash., to Bethlehem Steel Co., Seattle.
- 100 tons, control house and un-tanking tower, Bonneville dam, Vernita, Wash., to unnamed interest.
- 100 tons, bakery and laundry buildings, Mt. Hope, C. Z., to Truscon Steel Co., Youngstown, O.; McCarthy Bros. Construction Co., St. Louis, contractor.
- 100 tons, Mulberry street bridge approach, Kansas City, Mo., to Sheffield Steel Corp.
- 100 tons, Consolidated Cement Corp., Cement City, Mich., to Calumet Steel Co.
- 100 tons, pier addition, Philadelphia navy yard, to Truscon Steel Co., Kaufman Construction Co., contractor.
- 100 tons, Wabash railroad bridge, St. Louis county, Missouri, to Laclde Steel Co., St. Louis.

Pig Iron

Pig Iron Prices, Page 90

Pittsburgh—Production of iron is still at a high level. No new furnace activity has been announced but tonnage is being maintained at all active stacks. H. C. Frick Coke Co. has lit several hundred beehive ovens, ending speculation as to whether additional merchant buying could be expected from this company. Coke will supply furnaces of United States Steel Corp. subsidiaries in this district. Foundry activity is somewhat better and buying has moved up slightly. Prices are firm on the full market level.

Chicago—Releases of specifications for malleable and foundry grades of pig iron especially, but also for some basic, bessemer and low-phos in smaller lots, are increasing week by week as foundries and partsmakers press for earlier deliveries on the large volume of third and fourth quarter pig iron business placed in last summer's huge pig iron buying movement. Some forehanded consumers are inquiring as to possible furnace deliveries in the first quarter of next year.

Boston—With foundry melt improving, consumers are showing more concern as to future pig iron inventories and buying for last quarter delivery shows material volume in some instances. Although most consumers hold the opinion prices will remain unchanged for that period, current purchases are based more on estimated needs plus possibility of growing difficulties in securing prompt shipment due to demands on transportation. Demand for machine tool castings is outstanding.

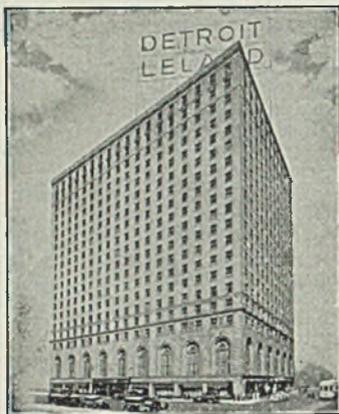
New York—Pig iron specifications continue to expand. Not only are substantial releases coming from machine tool builders and stove-makers, but from jobbing foundries engaged in miscellaneous work. The sharply increased melt is stimulating new orders as well as specifications against standing contracts. Only in the soil pipe consumption does there appear to be any noticeable let-down and at this season of the year this is to be expected.

While no new large orders are reported, shipments to England continue heavy. Foreign shipments otherwise are spotty.

Philadelphia—Business has increased sharply. Many foundries have made commitments covering not only fourth quarter requirements but for partly beyond. Nonintegrated steel mills also have been in the market lately, tonnage placed including lots ranging up to 10,000 tons. Some consumers appear fear-

Reinforcing Steel Pending

- 3000 tons, Poplar street housing project, Philadelphia, H. R. H. Construction Co., Philadelphia, low for general contract at \$3,397,000.
- 1700 tons, also 160 tons mesh, viaduct 5, Long Island railroad, Rockaway Beach, N. Y.; bids Sept. 26.
- 1200 tons, United States post office garage, Boston, Mass.; Bids Sept. 24.
- 1000 to 2000 tons, two storehouses, invitation 10034, naval fleet supply base, Oakland, Calif.; bids Sep. 25.
- 975 tons, mesh, state highway projects, New York; bids Oct. 2, at Albany.
- 717 tons, sheet piling, bureau of supplies and accounts, navy department, delivery Washington, D. C.; bids in.
- 550 tons, housing project, New Bedford, Mass.
- 550 tons, grade crossing elimination, section 5, contract 4, Atlantic avenue, Brooklyn, Long Island railroad, Arthur A. Johnson Corp., New York, low.
- 500 tons, housing project, Pawtucket, R. I.
- 350 tons, bridge over Mississippi river, Chester, Ill.
- 300 tons, foundations, building No. 77, Brooklyn navy yard, Turner Construction Co., contractor.
- 300 tons, housing project, Lawrence, Mass.; bids Sept. 17.
- 246 tons, bureau of reclamation, invitation A-46,938-A, Rutledge, Texas; bids opened.
- 225 tons, highway project, route 29, section 2D, Union county, New Jersey; bids Oct. 4, E. Donald Sterner, state highway commissioner, Trenton.
- 200 tons, six Illinois state highway bridges; bids Sept. 20.
- 165 tons, invitation 6813-41-51, air base, Alaska; bids opened.
- 148 tons, bureau of reclamation, invitation 38,492-A, Patero, Wash; bids opened.
- 140 tons, Consolidated Machine Tool Co. plant, Rochester, N. Y.
- 130 tons, Delaware Aqueduct, contract 367, Neversink, N. Y.
- 118 tons, wire mesh, metropolitan water district, Los Angeles, specification 344; Soule Steel Co., Los Angeles, low.
- 100 tons, Commonwealth Edison Co., Northwest station, Chicago, Ill.
- 100 tons, Cessna Aircraft Co., Wichita, Kans.
- 100 tons, county hospital addition, Tacoma, Wash.; bids in.
- 100 tons, addition state normal school, Bellingham, Wash.; bids in.



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GARAGE IN CONNECTION

ful pig iron prices will go higher, but it is generally believed no advance is in early prospect. Foundry operations are 5 points higher at 85 per cent, with many plants operating on a full five-day schedule per week. Certain blast furnace interests are taking steps to build up stocks of both basic and foundry iron to care for domestic customers more adequately. As a result less iron will be released for shipment abroad.

Scrap

Scrap Prices, Page 92

Pittsburgh—Buying in the local district was somewhat less active last week, although no grades have been reported sold at lower levels. Buying has been particularly lighter in heavy melting steel, with heavy demand still existing for electric furnace material and low phosphorus grades.

Chicago—Dealers appear to be the active figures currently in the iron and steel scrap markets in the Chicago area. Transactions are mainly confined at this time to negotiations between them in the endeavor of some to obtain material with which to make deliveries to consumers. Some of these deals have developed that certain sellers on old orders now are paying \$19.75 in cases to cover \$19.50 contracts, thus holding their customers. It has been reported but not confirmed that up to \$20 has been paid for such "short" coverage by some dealers, but not many. However, the range currently on No. 1 heavy melting steel here remains at \$19 to \$19.50 for the mills are refusing as yet to pay more than the top.

Youngstown Sheet & Tube Co. is understood to have bought an undisclosed tonnage of steel scrap at around \$20.

New York—Prices of most steel-making grades are unchanged, eastern Pennsylvania mills doing some conservative buying and taking more substantial shipments against old orders. Contracts placed by Great Britain will be completed late in October and it is reported Britain is negotiating for close to 150,000 tons, shipment to start in November. For export barge delivery, \$17 and \$16 now are top, and No. 2 cast is 50 cents stronger. Rails for rolling and heavy breakable cast are up slightly for domestic shipment.

Philadelphia—The market continues strong, although most steel-making grades are unchanged. No. 1 steel remains \$20.50 to \$21, with No. 2 material \$19.50 to \$20. Heavy cast scrap continues \$21. Some

additional business is reported but not in the heavy volume of a week to ten days ago. Grate bars and several specialty grades are 50 cents higher. The scrap trade believes that the licensing system on exports will be extended to other grades in addition to No. 1 steel, but that no restriction will be placed on British shipments.

Detroit—Scrap market shows unabated strength locally and prices are up 50 cents a ton on the average, excepting cast grades. Tonnage of sheet bundles was sold at above prevailing prices, possibly for short covering by out-of-town dealers. Short shoveling turnings are exceptionally strong, up \$1 a ton to \$12.00-\$12.50.

Warehouse

Warehouse Prices, Page 91

Chicago—Present good building weather and the near approach of autumn is sending a lot of small-tonnage concrete reinforcing bar and light structural business to the Chicago warehouses. Many small lots of bars in 10 to 25-ton lots are being sent by truck to job sites.

New York—Demand for steel from warehouse is heavy, orders being numerous and widely diversified. Plates and shapes are active and with some jobbers such volume is the best in recent years. Practically all lines of alloys are in strong demand, with no improvement in mill deliveries.

Philadelphia—Business is well sustained but for the month to date shows little change compared with August. A moderate pickup is looked for in October, but there is no expectation of a revival comparable to that of a year ago, when consumer inventories were light and the backing up of mill deliveries caused buyers to turn in increasing number of warehouses for prompt needs.

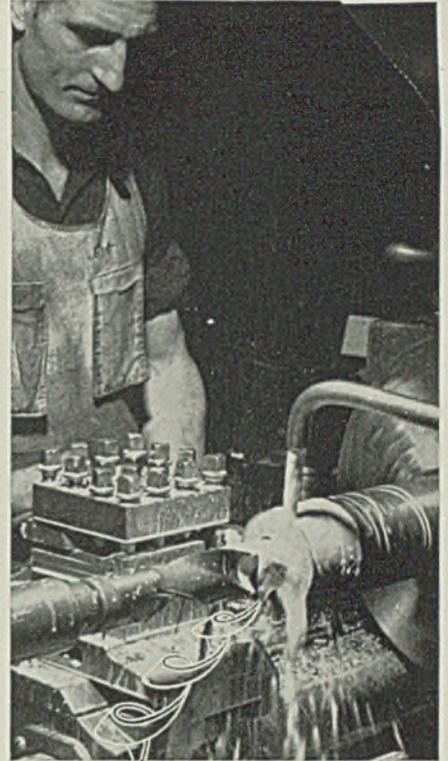
Iron Ore

Iron Ore Prices, Page 92

Cleveland—Entire Great Lakes ore fleet was operating in the ore trade on Sept. 15, according to a compilation by C. C. Lindeman, M. A. Hanna Co. statistician. This is the first time since August, 1937, that 100 per cent of the fleet has been in commission. The fleet now comprises 296 vessels.

Rising to the highest level of any month since August, 1929, consumption of Lake Superior iron ore in August amounted to 5,700,743 tons, according to the Lake Superior Iron Ore association. Consumption in

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July was 5,523,595 tons, during the first eight months of 1939 consumption amounted to 2,557,004 tons, compared with 23,693,355 tons in the corresponding period of 1939, an increase of 1½ per cent.

Stocks of ore at furnaces and on Lake Erie docks Sept. 1 totaled 32,934,665 tons, compared with 28,244,066 tons at the beginning of August and 32,714,372 tons on Sept. 1, 1939.

Nonferrous Metals

New York—A sudden spurt in copper buying late last week

strengthened prices and several grades of the red metal advanced. Offerings of nearby zinc remained tight while lead sales held up well.

Copper—Heavy sales late last week lifted the running total for the month to date to around 200,000 tons which would be a new monthly record. Casting copper advanced to 11.25c, resale electrolytic to 11.62½c, and red metal scrap to the basis of 10.00c for No. 1 heavy. Mine producers maintained firm price views at 11.50c, Connecticut. Actual consumption of copper rose to 81,063 tons in August, reflecting large British and American armament orders.

Lead—Clinton H. Crane, president of St. Joseph Lead Co., said that there is "no statistical reason for further weakness in the price of lead in the immediate future", although he pointed out that there is a "glut" of lead. Undertone remained steady last week on the basis of 4.75c, East St. Louis, as sellers approximately balanced their ore intakes.

Zinc—Demand continued heavy for third consecutive week and prime western held firm at 6.85c, East St. Louis.

Tin—Moderate buying was done by both consumers and Metals Reserve Corp. Prices remained unusually steady, fluctuating from 50.05c to 50.10c on Straits spot.

Reduces Carbide Tools

■ Firth-Sterling Steel Co., Pittsburgh, has issued a price reduction now in effect on sintered carbide tools and dies. The announcement states that, in many instances, the new carbide prices make it possible to manufacture or purchase carbide tipped tools at costs approximating those of solid high-speed steel tools.

Steel in Europe

Foreign Steel Prices, Page 91

London (By Cable)—Supplies of iron ore, scrap and semifinished steel are satisfactory, but hematite iron is becoming scarce. Finished steel output is almost completely absorbed for war purposes. Some tonnages may become available later for export. The export market for tin plate continues quiet.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 89

New York—Readjustment in bolt and nut schedules, affecting primarily the larger sized bolts and having little bearing on ½-inch and smaller sizes, has been announced in



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Nonferrous Metal Prices

Sept.	Copper			Straits Tin		Lead N. Y.	Lead East St. L.	Zinc St. L.	Alumi- num 99%	Anti- mony Spot, N.Y.	Nickel Cath- odes
	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	New York Futures						
14	*11.37 ½	11.50	11.00	50.10	50.05	4.90	4.75	6.85	18.00	14.00	35.00
16	*11.37 ½	11.50	11.00	50.05	50.05	4.90	4.75	6.85	18.00	14.00	35.00
17	*11.37 ½	11.50	11.00	50.05	50.05	4.90	4.75	6.85	18.00	14.00	35.00
18	11.50	11.50	11.12 ½	50.05	50.05	4.90	4.75	6.85	18.00	14.00	35.00
19	11.50	11.50	11.12 ½	50.10	50.05	4.90	4.75	6.85	18.00	14.00	35.00
20	11.50	11.50	11.25	50.05	50.05	4.90	4.15	6.85	18.00	14.00	35.00

*Based on custom smelter sales.

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F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 11.50c Conn. copper

Sheets	
Yellow brass (high)	18.65
Copper, hot rolled	20.12
Lead, cut to jobbers	7.15
Zinc, 100 lb. base	11.50

Tubes	
High yellow brass	21.40
Seamless copper	20.62

Rods	
High yellow brass	13.67
Copper, hot rolled	16.62

Anodes	
Copper, untrimmed	17.37

Wire	
Yellow brass (high)	18.90

OLD METALS

Nom. Dealers' Buying Prices	
No. 1 Composition Red Brass	
New York	7.50-7.75
Cleveland	8.25-8.75
Chicago	7.50-8.00
St. Louis	8.00

Heavy Copper and Wire	
New York, No. 1	9.12 ½ - 9.37 ½
Cleveland, No. 1	9.00-9.50
Chicago, No. 1	8.62 ½ - 9.00

St. Louis	9.00
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Composition Brass Turnings	
New York	7.12 ½ - 7.37 ½

Light Copper	
New York	7.12 ½ - 7.37 ½
Cleveland	7.00-7.50
Chicago	6.62 ½ - 7.00
St. Louis	7.00

Light Brass	
Cleveland	3.75-4.00
Chicago	4.75-5.00
St. Louis	4.50

Lead	
New York	4.25-4.35
Cleveland	3.75-4.00
Chicago	3.75-4.00
St. Louis	3.50-3.75

Zinc	
New York	3.87 ½ - 4.12 ½
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum	
Mls., cast, Cleveland	9.25-9.50
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.25
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	12.00
Standard No. 12 aluminum	14.00-14.50

the East for fourth quarter. This follows similar action recently by a leading Midwestern producer, and is designed to bring the gross list to a level more commensurate with the higher costs caused principally by increased wage rates and higher

plain material prices. New schedules become effective Oct. 1.

Washington — Navy took bids, Sept. 20, under schedule 3133 on 1050 tons of steel rivets for delivery to the Brooklyn and Philadelphia navy yards, 550 tons to the former.

Construction and Enterprise

Ohio

BELLEVUE, O.—City, G. A. Williams, safety director, is planning a \$425,000 water system expansion. City will vote Nov. 5 for bond issue. George B. Gascoigne and associates, Cleveland, are engineers.

MT. ORAB, O.—Village, Walter Baumgardner, mayor, plans a waterworks system, lime soda type, with elevated steel tank to cost \$60,000. C. J. Simon and associates, Van Wert, are engineers.

RUSHSVLVANIA, O.—Village, J. W. Hemminger, mayor, plans complete water and sewer systems with treatment plant to cost \$217,000. Edison Ellis, Van Wert, is engineer.

SOUTH WEBSTER, O.—Village, J. L. Keller, mayor, is planning a waterworks system with pumping equipment, elevated storage tanks, 35 fire hydrants, to cost \$100,000. Henry K. Martin, Portsmouth, is engineer.

Michigan

DETROIT—Budd Wheel Co., is erecting a 137 x 213-foot building. Fullerton Construction Co., Detroit, has contract.

DETROIT—Packard Motor Car Co., will erect a factory and motor testing

■ **Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 99 and Reinforcing Bars Pending on page 102 of this issue.**

building. C. A. Handeyside Construction & Engineering Co., is preparing plans.

DETROIT—Michigan Bell Telephone Co., will erect a four-story building 50 x 140 feet in Lansing to cost \$300,000. Smith, Hynchman and Grylls, Detroit, are architects.

FLINT, MICH.—Chevrolet division of General Motors Corp., will erect an addition to its service building. Albert Kahn Associated Architects and Engineers Inc., is engineer.

Pennsylvania

EASTON, PA.—Lehigh Foundries Co., suffered \$25,000 fire loss to its plant, but has plans for immediate rebuilding.

Alabama

DECATUR, ALA.—Jones Hettelsater Construction Co., Mutual building, Kansas City, Mo., has contract for a \$500,000 flour mill for Nebraska Consolidated Mills, Omaha, Neb. Great Western Mfg. Co., Leavenworth, Kans., has contract for machinery.

FAIRFIELD, ALA.—Tennessee Coal Iron & Railroad Co. plans two bathhouse additions to cost \$35,000. Building will have steel frame and metal walls. E. B. Van Buren, Farley building, is architect.

GADSDEN, ALA.—V. B. Higgins & Co.,

Jefferson building, Greensboro, N. C., has contract for filter plant to cost \$243,940. Wiedeman & Singleton, Candler building, Atlanta, Ga., is engineer.

MOBILE, ALA.—Constructing quarter-master, Southeast air depot, let contract at \$1,350,000 to A. J. Rife Construction Co., 2808 Maple Lawn, Dallas, Tex., for airplane repair shop.

Maryland

BALTIMORE—General Electric Co., Schenectady, N. Y., has generator contract and Babcock & Wilcox Co., 85 Liberty street, New York, received boiler award for third power unit to be constructed by Consolidated Gas, Electric Light & Power Co.

District of Columbia

WASHINGTON—Public utilities commission authorized Capital Transit Co., to borrow \$1,636,000 for purchase of 35 street cars and 112 busses.

WASHINGTON—Office of General Purchasing Officer, The Panama Canal, will receive bids till Sept. 27 on schedule 4352 for following: 160 steel family type dressers, 8 steel library tables, 160 metal single beds.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids as follows: Sept. 27, schedule 3191, honing and lapping machine; schedule 3198, grinders; schedule 3135, oxyacetylene cutting machines; schedule 3143, three metal-cutting automatic hacksaws;

schedule 3156, one centerless grinder; schedule 3091, horizontal milling, drilling, boring machines; schedule 3107, fifty arc welding sets; schedule 3109, one rivet heading machine; schedule, 3110, one cupola; schedule 3114, two electric furnaces; schedule 3115, six pneumatic holsts; schedule 3117, one automatic screw machine; schedule 3090, lathes; schedule 3260, four arc welding sets; schedule 3231, one universal grinder; schedule 3232, 1800 hospital beds; schedule 3220, deep boring engine lathes and rifling machines; schedules 3223 and 3224, 1675 blank steel shells. Oct. 1, schedule 3240, air compressors. Oct. 4, schedules 3216, 3217, motor trucks; schedule 3241, two universal grinders; schedule 3236, motor-driven hacksaw. Oct. 8, schedule 3255, 35 portable pumps; schedule 3254, contouring machine; schedule 3251, steel anchors; schedule 3228, testing generators.

Florida

JACKSONVILLE, FLA.—Boyd & Goforth, 617 North Smith street, Charlotte, N. C., have contract at about \$120,000 for water supply plant for extension area at Naval Air Station.

ORLANDO, FLA.—State WPA authorized construction at Orange county airport to cost \$271,719 and at St. John's county, St. Augustine.

STUART, FLA.—U. S. engineer office, Jacksonville, let \$99,600 contract to Satchwell & Joseph Electric Co., 609 Laura St., Jacksonville, for construction and installation of machinery, electrical system and central control station, St. Lucie Lock, on St. Lucie Canal, 8 miles from Stuart.

Georgia

HOMERVILLE, GA.—W. A. Smith, Louisville, Ky., has contract for 190 miles of line for Slushpine Electric Membership Corp., costing \$87,600.

Mississippi

BATESVILLE, MISS.—City let contract at \$33,000 to Stuart Irby Co., Jackson, for electric distribution system.

CLARKSDALE, MISS.—Coahoma elec-

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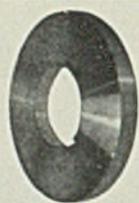
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—Construction and Enterprise—

tric association let contract at \$71,000 to Sullivan, Long & Hagerty, Bessemer, Ala., for 140 miles of transmission lines in seven counties. Boman & Boman, Greenwood, are engineers.

COLUMBIA, MISS.—Oman Construction Co., Acklen Park, Nashville, Tenn., has contract for addition to electric distribution system for Pearl river valley electric power association. Material and equipment will be furnished by General Electric Co., Schenectady, N. Y. Francis & Haley, 334 Brown-Marx building, Birmingham, Ala., are engineers.

JACKSON, MISS.—Bids are being received for REA Project 39B, L. C. Wintertons, Pascagoula, is engineer.

TAYLORSVILLE, MISS.—Southern Pine electric power association let contract at \$274,221 to Delta Construction Co., Clarksdale, for 527 miles of transmission lines in 11 counties.

North Carolina

BAYBORO, N. C.—Pamlico-Beaufort Electric Membership Corp., H. M. Harris, chairman, is planning 150 miles of transmission lines in Pamlico and Beaufort counties.

CHARLOTTE, N. C.—Warren Transfer Co., will erect a two-story warehouse 90 x 222 feet to cost \$30,000. J. A. Jones Construction Co., is contractor.

ELKIN, N. C.—Chatham Mfg. Co. has suffered fire loss of \$250,000.

GRANITE QUARRY, N. C.—City voted \$43,000 bonds for water and sewerage system. Total cost is \$110,000. WPA project.

MOORESVILLE, N. C.—City votes Oct. 15 for \$150,000 water and sewer expansion bonds.

MONROE, N. C.—Union Electric Membership Corp. has REA allotment of \$158,000 for extending transmission lines in Macklenburg, Cabarrus, Rowan, Stanly and Union counties.

South Carolina

ABBEVILLE, S. C.—Little River Co-operative Inc. will build 183 miles of transmission lines costing \$159,000 to serve 635 consumers.

BAMBERG, S. C.—Edisto electric co-operative has REA allotment of \$156,000 for 190 miles of transmission lines in Dorchester, Bamberg and Orangeburg counties.

CHARLESTON, S. C.—Central Engineering Co., Davenport, Iowa, has contract at \$360,730 for superstructure, walls and roof for Santee-Cooper power house at Pinopolis for South Carolina public service authority. Harza Engineering Co., Charleston, is engineer.

KINGSTREE, S. C.—Wannamaker & Wells Inc., Orangeburg, was low bidder for transmission line in Clarendon, Florence, Georgetown and Williamsburg counties. Santee Electric Co-operative Inc., W. L. Harrington, president, is owner. J. B. McCrary Engineering Corp., Atlanta, Ga., is engineer.

NEWBERRY, S. C.—Newberry Electric Co-operative Inc., E. W. Armour, president, will receive bids Sept. 26 for 124 miles of transmission lines in Newberry, Laurens, Lexington and Fairfield counties. J. B. McCrary Engineering Corp., Atlanta, Ga., is engineer.

WINNSBORO, S. C.—Fairfield county co-operative has REA allotment of \$70,000 for 75 miles of transmission lines in Chester, Fairfield and Kershaw counties.

Tennessee

KNOXVILLE, TENN.—Tennessee valley authority will erect substation on Concord street to cost \$500,000.

KNOXVILLE, TENN.—Honeycutt Engineering Co. is making a survey to extend transmission lines under REA in Morgan county. REA will spend \$6,000,000 in Tennessee in fiscal year.

MEMPHIS, TENN.—Henry Ihle, 220 Broadway, New York, was low at \$91,945 to Memphis Light and Gas commission for one section of underground electric distribution system. Consolidated Contractors, Dermon building, Memphis, was low at \$66,444 for other section.

West Virginia

SALEM, W. VA.—State board of control, Charleston, asks bids about Oct. 1 on dormitory and administration building at Girls' Industrial Home. \$150,000 available. Dormitory to be three stories, to contain 64 rooms. J. C. Burdinal, Wheeling, W. Va. is architect.

WELCH, W. VA.—City voted \$75,000 bonds for 3-story parking building to accommodate 300 cars.

Virginia

FORT EUSTIS, VA.—Constructing quartermaster, Ft. Monroe, Va., let contract at \$386,000 to Dewey G. Weddle & Co., National Bank of Commerce building, Norfolk, for 66 frame mobilization type buildings here.

LYNCHBURG, VA.—American Manganes Corp. of Altavista, Albert Maretzek, president, 30 Broad street, New York, will spend \$1,500,000 for a refining plant and to develop manganese fields in Lynch station area of Campbell county.

NORFOLK, VA.—Virginia Electric & Power Co., will spend \$4,000,000 on its Reeves avenue power plant, including a 40,000-kilowatt unit and high pressure boiler in a new building extension.

WAYNESBORO, VA.—August Co-operative Farm Bureau Inc. plans \$20,000 refrigerator locker plant to contain 600 lockers; Daley Craig and Fleming Hurt are architects.

Missouri

NEVADA, MO.—City, Lynn M. Ewing, mayor, will vote Nov. 26 on a \$490,000 bond issue to finance a 1500-kilowatt power plant. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, is engineer.

ST. LOUIS—Sears, Roebuck & Co., will erect a one-story warehouse to cost \$650,000. Mimmons, Carr & Wright, Chicago, are architects.

Oklahoma

OKLAHOMA CITY, OKLA.—City, W. A. Quinn, city manager, is planning a \$6,911,000 water project.

Wisconsin

CENTURIA, WIS.—Polk-Burnett electric co-operative, Dorris D. McChesney, superintendent, is making a survey for its fourth section of transmission lines and will apply to REA for funds. Wisconsin development authority, 522 Tenney building, Madison, is engineer.

EAU CLAIRE, WIS.—REA has allotted \$126,000 to Eau Claire electric co-operative, F. R. McFarland, superintendent, for 141 miles of transmission lines in Chippewa, Eau Claire, Jackson and Trempealeau counties to serve 325 consumers.

GAYS MILLS, WIS.—REA has allotted \$31,000 to Crawford electric co-operative, C. H. Hooverson, superintendent, for 70 miles of transmission lines in Crawford and Vernon counties to serve 172 consumers.

LA CROSSE, WIS.—Tri-State power co-operative, has extended contract of I. & E. Construction Co., Minneapolis, to include an additional 118 miles of transmission lines in Minnesota, Wisconsin and Iowa to cost \$108,700. Banister Engineering Co., 1586 University avenue, St. Paul, is engineer.

LA CROSSE, WIS.—Tri-State power co-operative has let contract to Holtze Bros., Chippewa Falls, at \$43,200 for transmission lines in Iowa and Wisconsin. Banister Engineering Co., St. Paul, is consulting engineer.

LANCASTER, WIS.—REA has allotted \$59,000 to Grant electric co-operative, Clyde G. Newcomb, superintendent, for 99 miles of transmission lines in Grant county to serve more than 350 consumers.

WEST SALEM, WIS.—Village, B. H. Meyers, clerk, will apply for WPA funds to help finance a sewage treatment plant and interceptor sewers to cost \$50,000. A. E. McMahon, Menasha, is engineer.

Minnesota

ANOKA, MINN.—City, Wayne Ridge, clerk, will make survey for a \$120,000 sewage disposal plant including sedimentation, trickling filter, clarifier, and chlorinator. Ralph D. Thomas and associates, 1200 Second avenue, S., Minneapolis, is engineer.

MELROSE, MINN.—REA has allotted \$208,000 to Stearns electric co-operative, George Halonen Jr., superintendent, for 250 miles of transmission lines to serve 675 consumers in Stearns, Morrison, Tood, Pope and Kandiyohi counties.

MONTICELLO, MINN.—Village, L. L. Hawkins, clerk, will vote Sept. 24 on a \$10,000 bond issue to finance a new water tank.

PELICAN RAPIDS, MINN.—REA has allotted \$149,000 to Lake Region electric co-operative, Albert R. Knutson, superintendent, for 195 miles of transmission lines to serve 400 consumers in Becker and Wilkin counties.

ROCHESTER, MINN.—Peoples power co-operative, Frank I. Kiley, superintendent, has recommended the awarding contract to John P. O'Neill, Faribault, at \$135,009 for 235 miles of transmission lines in Olmstead, Mower, Dodge, Wabasha and Winona counties. Gausman & Moore, 1026 E. First National Bank building, St. Paul, are engineers.

Texas

ATHENS, TEX.—New Era Electric Co-operative plans addition to transmission lines in Henderson, Anderson, Freestone and Smith counties. Beavers and Loyal, San Antonio, are engineers.

BEAUMONT, TEX.—City has completed survey for rehabilitation of waterworks system. Albert C. Moore & Co., is engineer.

FREEMONT, TEX.—City voted \$180,000 bonds for water system and \$45,000 for sewer modernization and extension. H. G. Olmsted, P. O. Box 1016, Houston, is engineer.

GRANBURY, TEX.—Hood county electric co-operative will build 124 miles of transmission lines to cost \$90,000. Freese & Nichols, Capps building, Ft. Worth, are engineers.

HENDERSON, TEX.—Rusk county elec-

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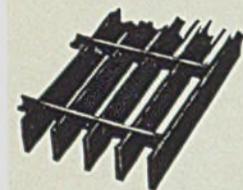
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—Construction and Enterprise—

tric co-operative, W. R. Mehner, superintendent, will build 150 miles of transmission line to cost \$100,000. Freese & Nichols, Capps building, Ft. Worth, are engineers.

McALLEN, TEX.—Rio Grande Valley By-Products Corp., Bolton Hyde, president, let \$500,000 contract to N. R. Nelson Co., for three buildings for boiler house, water treatment and building.

Kansas

BURLINGTON, KANS.—Jack Palmer Construction Co., Trenton, Mo., was low on 140 miles of transmission lines in Franklin, Anderson, Woodson, Coffey and Greenwood counties, for Coffey county rural electric co-operative, L. S. Pitcher, superintendent. Paulette & Wilson, 1006 Kansas avenue, Topeka, are engineers.

CLAY CENTER, KANS.—City, Clay C. Smith, mayor, is taking bids to Oct. 9, on \$150,000 improvements to power plant, including boiler unit, steam turbine, generator and condenser equipment. Burns & McDonnell, 107 West Linwood boulevard, Kansas City, Mo., is engineer.

EL DORADO, KANS.—Butler rural electric co-operative has awarded \$181,302 contract to Sandberg & Johnston, Hampton, Ia., for 316 miles of transmission lines in Butler, Harvey and Sedgwick counties. K. R. Brown, 802 Valley Bank building, Des Moines, Ia., is engineer.

EMPORIA, KANS.—Jack Palmer & Co., Trenton, Mo., was low on 190 miles of transmission lines in Lyon county to serve 410 consumers of Lyon county electric co-operative, M. E. Turkle, acting superintendent. C. H. Guernsey & Co., Cherokee, Okla., is engineer.

JUNCTION CITY, KANS.—D. S. & O. rural electric co-operative has awarded contract to Matteson Construction Co., Britton, Okla., at \$101,992, for 187 miles of transmission lines.

North Dakota

KINDRED, N. DAK.—REA has allotted \$343,000 to Cass county electric co-operative, A. J. Truskind, manager, for 518 miles of transmission lines in Cass, Richland, Sargent, Barnes, Stutsman, Ransom and Dickey counties to serve about 1000 consumers. M. S. Hyland, 1114 Eighth avenue N., Fargo, is engineer.

Iowa

DAVENPORT, IOWA—Eastern Iowa light & power co-operative, S. N. Jordan, superintendent, has awarded \$116,431 contract to J. H. Hunzinger & Co., for 169.4 miles of transmission lines in Des Moines, Louisa and Muscatine counties. K. R. Brown, 802 Valley Bank building, Des Moines, is engineer.

KNOXVILLE, IOWA—City, Frank Crawford, clerk, is taking bids to Oct. 8, on \$140,000 of improvements to waterworks plant according to specifications obtainable from Foth & Boyd, 304 Architects' building, Green Bay, Wis.

SAC CITY, IOWA—Sac county rural electric co-operative, Charles J. Loyrien, superintendent, has awarded \$52,775 contract to Evans Construction Co., Earley, for 101.85 miles of transmission lines in Sac county. K. R. Brown, 802 Valley Bank building, Des Moines, is engineer.

Wyoming

RIVERTON, WYO.—REA has allotted \$86,000 to Riverton Valley electric association, L. S. Landmichl, superintendent.

for 110 miles of transmission lines in Fremont county to serve 220 consumers.

Montana

COLUMBUS, MONT.—D. M. Manning, Hysham, Mont., is low at \$232,870 for 269 miles of transmission line for Bear-tooth electric co-operative in Carbon and Stillwater counties, Montana, and Park county, Wyoming.

Idaho

POCATELLO, IDA.—Ralston-Purina Co., W. H. Danforth, president, is planning to build a feed plant.

Pacific Coast

LOS ANGELES—Shaw Machine Tool Co., 1151 Temple street, has been formed by Edward T. Gadden.

LOS ANGELES—Norris Stamping & Mfg. Co. will erect building 120 x 500 feet to cost \$65,000.

LOS ANGELES—A-1 Bearing Co., 1422 West Slauson avenue, has been formed by William H. Bogart and E. L. Wright.

LOS ANGELES—Johansen Aircraft Corp. has been formed with a capital of \$500,000. Directors are: Walter E. Johansen, Peter L. and Lund P. Stenderup, of Los Angeles.

LOS ANGELES—California Metals & Engineering Corp. has been organized with 1000 shares of no par value capital stock. Directors are H. L. and Anna M. Basset and Wilma Welts, of Los Angeles. Corporation is represented by David Welts, 6411 Melrose avenue.

LOS ANGELES—La Brea Aviation Co. has been organized with a capital of \$100,000. Directors are: E. A. Leeds, George W. Matthews and L. E. Sullivan, of Los Angeles. Corporation is represented by Stephens, Jones, Inch and LaFever, California Bank building.

SAN DIEGO, CALIF.—Consolidated Aircraft Corp. has acquired the one million dollar assets of Hall Aluminum Aircraft Corp., including machinery and equipment.

LINNTON, OREG.—Union Oil Co. is building a boiler house at local water terminals. C. C. Moore & Co., San Francisco, is contractor. Two boilers, resting on steel frames, are by Collins Western Boiler Co., Los Angeles.

SALEM, OREG.—Bonneville project has awarded contract for a substation to L. H. Hoffman, Portland, low at \$59,975.

KENNEWICK, WASH.—Kennewick Valley Telephone Co., A. F. Brown, manager, is planning a fireproof exchange building.

OLYMPIA, WASH.—Olympia Oil & Wood Products Co. will build a \$30,000 plant here. Joseph Wohleb is architect. General contract awarded to H. G. Homann, Vancouver, Wash.

PUGET SOUND NAVY YARD, WASH.—Commander R. E. Thomas will receive bids to Oct. 2 for ammunition, igniter and exploder buildings at Keyport naval station, and also a 26 x 58-foot addition to machine shop.

SEATTLE—General Construction Co., Seattle, has begun work on a \$4,500,000 shipyard for Seattle-Tacoma Shipbuilding Co. on Harbor Island.

SEATTLE—Transportation commission has postponed to Sept. 27 opening of bids for construction of \$300,000 storage, inspection and shop building. McClelland & Jones and Thomas, Grainger & Thomas are architects.

SPOKANE, WASH.—Washington Water Power Co. has purchased a site on which it will build a warehouse and service building.

WALLA WALLA, WASH.—City Electric Co., Nampa, Ida., is low at \$101,946 for 219 miles of transmission line for Columbia rural electric association in Walla Walla county.

Canada

BRANTFORD, ONT.—Schultz Construction Co., has contract for \$50,000 plant addition to Slingsby Mfg. Co.

DELORO, ONT.—M. Sullivan & Sons Ltd., Arnprior, Ont., have contract for \$20,000 plant addition for Deloro Smelting & Refining Co. Ltd.

DUNDAS, ONT.—Work has started on plant addition for Steel Fabricating & Welding, Ltd., Hatt street, to cost \$20,000. N. Wagner, 378 Queen street South, Hamilton, is engineer.

HAMILTON, ONT.—W. H. Cooper Construction Co. Ltd., has contract for \$20,000 plant for Super Oil Seal Mfg. Co., Ltd.

NEW TORONTO, ONT.—Ross & Macdonald, 1010 St. Catharine street West, Montreal, architects, are preparing plans for \$250,000 plant addition to Anaconda American Brass Ltd.

NIAGARA-ON-THE-LAKE, ONT.—Shepherd Boats & Equipment, St. Catharines, plans \$35,000 plant.

PORT ROBINSON, ONT.—Chemical Construction Co., 30 Rockefeller Plaza, New York, have contract for plant of North American Cyanamid Ltd., Fourth street, Niagara Falls, Ont. Plant and equipment to cost \$12,000,000. Findlay & Mann, 449 Queen street, Niagara Falls, are architects.

SCARBOROUGH TOWNSHIP, ONT.—Canadian Line Materials, Ltd., L. E. Messinger, manager, Scarborough, Ont., plans 36 x 60 foot one-story plant addition to cost \$75,000.

TORONTO, ONT.—Ontario hydro electric power commission, is planning a power project on Madawaska river to develop approximately 200,000 horsepower.

WINDSOR, ONT.—Allan Construction Co. Ltd., 44 Wyandotte street East, has contract for \$30,000 plant addition to Kelsey Wheel Co. Ltd., 300 Ellis avenue.

WOODSTOCK, ONT.—Standard Tube Co. Ltd., will erect \$30,000 plant.

MONTREAL, QUE.—Saunders Valve & Supply Co. Ltd., is planning \$50,000 plant.

MONTREAL, QUE.—Tenders have been received and contracts will be awarded soon for \$50,000, 60 x 260 foot plant addition to Canadian Tube & Steel Products Ltd., 5674 Hamilton street.

MONTREAL, QUE.—Anglin Norcross Corp. Ltd., has general contract and MacKinnon Steel Co. Ltd., Sherbrooke, Que., has structural steel contract for \$250,000 foundry and machine shop for Electric Steels Ltd.

MONTREAL, QUE.—Anglin Norcross Corp. Ltd., has let structural steel contract to Eastern Canada Steel & Iron Works Ltd., Quebec, and reinforcing steel contract to Truscon Steel Co. of Canada Ltd., for \$1,500,000 plant of department of national defense, Ottawa, Ont.

VALLEYFIELD, QUE.—Nichols Chemical Co. Ltd., 1111 Beaver Hill Hill, Montreal, has started work on \$1,000,000 sulphuric acid plant.

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1—230 HP GECO —MDS-109.5	500V 435 RPM
1—140 HP WECO —MC90	500V 515 RPM
1—125 HP GECO —MDS-108	230V 435 RPM
1—75 HP GECO —MDS-106	230V 485 RPM
1—45 HP WECO —K9	230V 515 RPM
3—30 HP GECO —MD-104	230V 750 RPM
8—20 HP WECO —K6	230V 515 RPM
20—12 HP GECO —MD-102	230V 875 RPM
1—10 HP WECO —K4	230V 890 RPM
3—6.5 HP WECO —K3	230V 690 RPM

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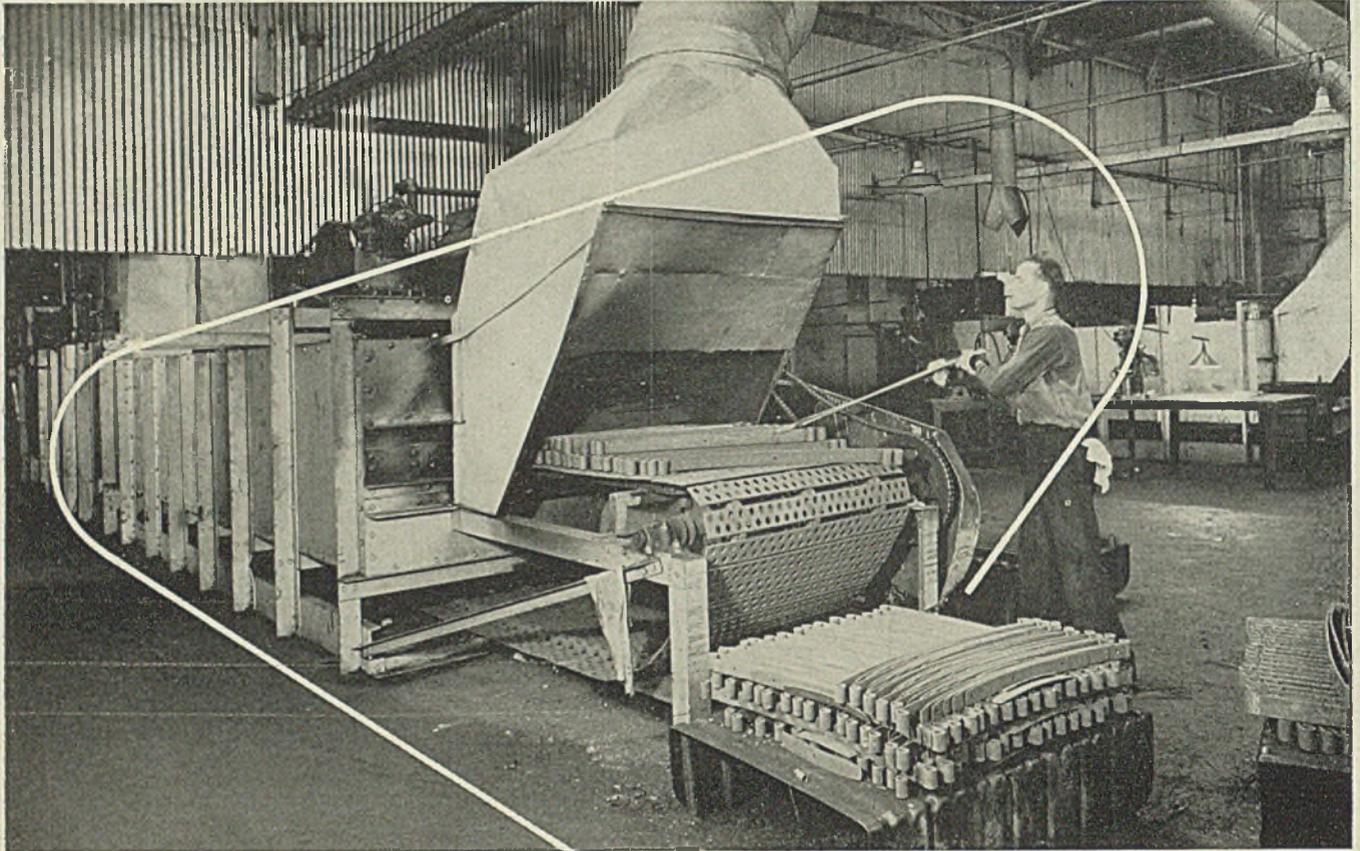
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National Screw & Mfg. Co.	15	South Bend Lathe Works	—	Z	
National Steel Corp.	2, 105	Standard Galvanizing Co.	—	Zeh & Hahnemann Co.	—
National Telephone Supply Co., Inc.	—	Standard Steel Works	—		
National Tube Co.	—	Stanley Works, The	108		
New Departure Division General Mo- tors Sales Corp.	—	Steel & Tubes Division, Republic Steel Corp.	65		
New Jersey Zinc Co.	—	Steel Conversion & Supply Co.	—		
New York & New Jersey Lubricant Co.	—	Steel Founders' Society of America	75		
Niagara Machine & Tool Works.	—	Steelweld Machinery Division, Cleve- land Crane & Engineering Co.	—		
Nicholson, W. H., & Co.	—	Stewart Furnace Division, Chicago	—		
Niles Steel Products Div., Republic Steel Corp.	65				
Nilson, A. H., Machine Co.	110				
Nitralloy Corp., The	—				
Norma-Hoffmann Bearings Corp.	—				
North American Manufacturing Co.	—				
Northern Engineering Works	—				

Efficiency UP

as **EATON** leaf springs are tempered
in modern **GAS**-fired furnace



In hardening and tempering a wide variety of springs, the Detroit Plant of Eaton Manufacturing Company finds that Gas and modern Gas equipment make for both efficiency and economy.

Eaton springs are hardened and tempered in Gas-fired draw furnaces, using the modern principle of recirculated air. These Gas furnaces give close temperature and atmosphere control, assuring uniformity—which reduces “rejects”—and affording unusual flexibility. And this flexibility has helped Eaton immeasurably to key its production to order fluctuations with efficiency and economy.

Gas thus plays its part, with modern Gas equipment, to produce springs which Eaton Company markets with pride and growing success.

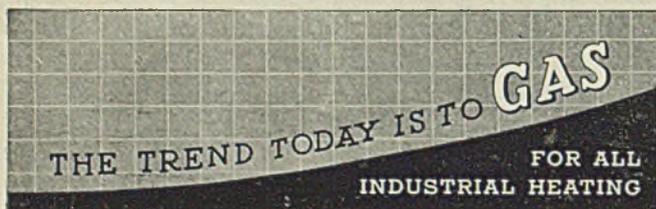
Gas-fired draw furnace for leaf springs in plant of Eaton Mfg. Company, Detroit.



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If you have a heat treating problem in your plant, investigate the many advantages of Gas and Gas equipment.

For there's nothing so efficient—or flexible—or economical—as Gas for hardening, annealing, tempering, normalizing, blueing, carburizing, forging, galvanizing—and other industrial heating processes—as you may easily find out by drawing upon the technical experience of your own Gas company.



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