STEEL

ESTABLISHED 1882

Contents

Volume 109—No. 12 September 22, 1941

Only through improved mechanization will industry find the 15 billion *additional man hours* needed to meet the requirements of our Defense Program . . . Men who watch the steel go by are establishing new production records with Morgan Continuous Rolling Mills because Morgan has always planned and built for the *future.*

R-92

MORGAN
WORCESTER
ENGINEERS AND
MANUFACTURERS

MORGAN CONSTRUCTION COMPANY • WORCESTER, MASSACHUSETTS

HIGHLIGHTING THIS ISSUE OF STEEL

■ STEEL this week (p. 39) begins publication of a new feature, "Defense Contract Opportunities." Made possible by co-operation from OPM's Division of Contract Distribution, it lists facilities and abilities that are needed on defense work and hence is intended to help those manufacturers who need defense work in order to keep their plants in operation. Additional leads to high-priority work also may be obtained from the list of new awards announced last week (p. 41) by the War Department. Additional information on this subject also is set forth in the article (p. 21) which details some activities of the Division of Contract Distribution and how it is helping to get subcontracts placed.

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Order M-21 Is Amended

General Preference Order M-21 has been amended to make less burdensome the task of filling in forms by producers and purchasers of steel. The amended form appears in full on p. 24. The new Supplementary Order M-21-a applying specifically to alloy steel, alloy iron and wrought iron also is published in full . . . Among the developments of last week are included (p. 31) revised priorities on maintenance and repair supplies to utilities and an A-1-a rating for mine maintenance and repairs, a request (p. 32) for more efficient use of railroad equipment, freezing (p. 26) of by-product coke prices . . . This week's editorial by Mr. Shaner (p. 46) is on Canada's lesson in sincerity—a lesson, he feels, that should be heeded here.

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Steel Houses For Defense

The grave shortage of scrap last week (p. 89) brought out some more violations of the price ceiling . . . Curtailment of automobile production is to reach 48.4 per cent by December and production of other peacetime products is to be cut shortly. Accordingly, new buying of steel for nondefense purposes has dropped sharply. . . . A new all-steel house for employment on defense projects (p. 40) can be knocked down and quickly reassembled on a new location . . . High-manganese concentrates are being produced (p. 33) from low-grade Nevada ore in a pilot plant . . . The new Brazilian steel plant (p. 36) is to have a by-product coke plant . . . C. E. Wilson makes interesting statements (p. 35) about defense production costs.

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Manufacture of Optical Parts

Manufacture of optical glass and optical parts for rangefinders and other fire-control instruments at Bausch & Lomb is described (p. 52) by Professor Macconochie . . . . Aircraft material specifications (p. 56) are being standardized rapidly . . . Fred B. Jacobs points out (p. 62) that abrasive wheels are cutting implements and should be selected with care . . . A new cold-mill feed table that is semiautomatic and that maintains sheet alignment is described (p. 68) by Steel Plant Editor John D. Knox. Sheets are fed with greater speed and accuracy than heretofore possible.

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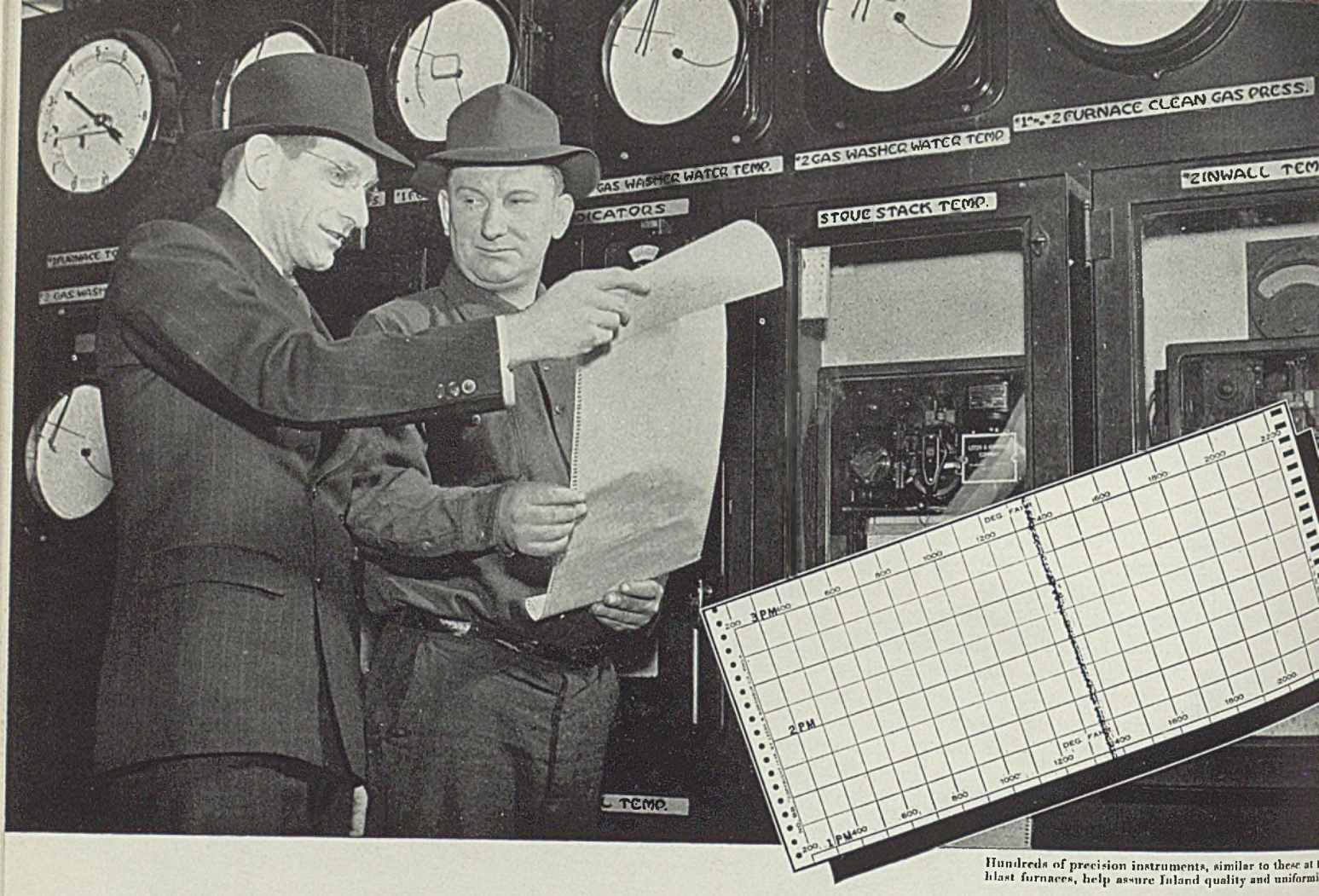
Automatic Shell Forging

New shell forging machine (p. 50) automatically pierces and draws 90-millimeter shell blanks with output of 240 to 300 per hour. It features automatic handling, a rotary indexing table, automatic cooling and lubricating systems . . . A unique roller platform on a power lift truck (p. 58) makes provisions for unloading work from either side or the end of the platform . . .. J. D. Zaiser tells (p. 66) how special bronze aircraft parts are produced in large quantities and to close tolerances . . . Ageing of tools and dies is described (p. 71) by W. P. Boyle . . . The navy makes large valves (p. 72) by welding rolled and forged steel parts together.



Hundreds of precision instruments, similar to these at I
blast furnaces, help assure Inland quality and uniformi

Featherweight Fingers Help Maintain INLAND Quality

LOCATED near the base of each towering Inland blast furnace are control instruments on which featherweight fingers trace delicate ink lines. Every line on the charts is a record essential to the daily production of thousands of tons of Inland Quality Pig Iron.

Attendants closely watch these precision instruments, which continually indicate blast furnace operating efficiency, and prove a great aid in obtaining pig iron of the uniformity and quality demanded by Inland. At the end of each day the charts are sent to the plant office, where they are thoroughly studied and analyzed.

The use of precision instruments is an old story in the Inland Plants, where many developments of this kind have been pioneered. Today, modern control instruments are used not only at the Inland blast furnaces, but at the open hearths, soaking pits, reheating furnaces, rolling mills—wherever steel is made, heated and worked.

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INLAND STEEL CO.

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

Defense Clinics Reveal Subcontracting Opportunities for Small Plants

Ohio caravan visits eight cities, taking samples and blueprints to potential producers . . . SPAB orders expanded production of all critical materials for arms program

TRANSITION from civilian to defense production, rapidly becoming mandatory for thousands of metalworking companies as priority control over raw materials is tightened, is being facilitated by subcontracting clinics being held or scheduled to be held by regional offices of the OPM Division of Contract Distribution.

A series of such clinics was started last week in Ohio under the sponsorship of the Cleveland OPM office. Approximately 30 prime defense contractors, holding an estimated $5,000,000,000 in orders, are visiting seven Ohio towns and Erie, Pa. Meetings are arranged in cooperation with local chambers of commerce and the prime contractors show samples, blueprints and specifications to potential subcontractors. An average of about 300 potential subcontractors have attended the first clinics.

Results of the meetings have been termed "very gratifying" by C. R. Terry, Cleveland district manager of the Division of Contract Distribution. Although spot agreements were not expected to result, several were reported within two hours after the meetings opened. At the close of the fourth meeting, nearly 100 negotiations were in progress.

Register Available Equipment

The tour arranged by the Cleveland OPM office is the first of its kind, although other districts are expected to hold similar roundups.

At New York, representatives of 6000 to 8000 small machine shops and other metalworking companies will participate in a defense clinic to be held Sept. 22-24 in Grand Central Palace. They will meet with more than 250 prime contractors.

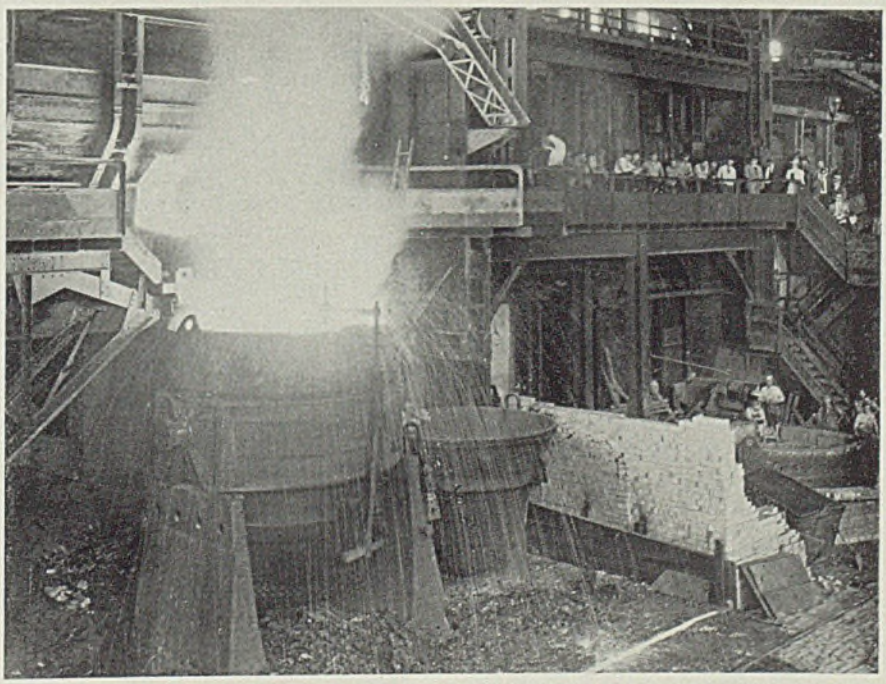
The potential subcontractors registered, last week, their available equipment and information pertaining to the type of work they could produce. Information was registered with the New York State Division of Commerce and the district offices of the Division of Contract Distribution, OPM.

Registration of facilities available was considered particularly important, as complete analysis of the equipment is essential if the clinic is to serve its purpose. Corps of 12 engineers and consultants was lent by Consolidated Edison Co. to make a survey of equipment available, that the large number of small manufacturers might most expeditiously be placed in contact with the large manufacturers most likely to find their facilities useful.

Prime contractors, under OPM sponsorship, were invited to send as many representatives each as possible, and to have prepared detailed specifications of work they can subcontract. Where possible, they were asked to bring actual samples of the parts to be subcontracted, to facilitate selection of properly tooled subcontractors.

One objective of the clinic, it was reported by an OPM executive, is to arrange for many "key subcontractors" whose job it would be to undertake management, engineering and financing of subcontracts for groups of 10 or 12 small fabricators. Several such arrangements are already reported set up in the

Wisconsin Steel Taps New Open Hearth



First steel was poured last week from the new 150-ton open hearth furnace at the Wisconsin Steel Works of International Harvester Co., South Chicago. The furnace, one of two being built by the company, was finished 45 days ahead of schedule. As part of the same expansion program, Wisconsin Steel has installed a 220-ton crane, a charging machine and a 2-hole soaking pit. Photo shows pouring of first heat in presence of newsmen and guests

New York area, and are said to have been very successful.

OPM had a group of engineers at work last week classifying requests of potential subcontractors who wished to attend the clinic, and attempting to balance them against subcontractors, listing the 10 or 12 prime contractors most likely to have work available for them.

After a slow start, regional offices of the Division of Contract Distribution (formerly Defense Contract Service) are completing their organizations and are lending effective aid to companies whose supplies for nondefense production are being curtailed. Many are issuing circulars listing subcontracting opportunities where priority ratings can be obtained.

(See Defense Contract Opportunities, page 39.)

Manufacturers desirous of obtaining defense subcontracts are being urged to keep in touch with their regional OPM offices and to file statements with these offices regarding facilities—machinery, personnel, management and experience. Preferably such statements should be prepared in quantity and distributed to prime contractors from whom subcontracts are desired.

List of OPM Field Offices

OPM field offices are located in the Federal Reserve Banks and branch banks in the following cities:

Atlanta, Ga.	Memphis, Tenn.
Baltimore	Nashville, Tenn.
Birmingham, Ala.	New Orleans
Boston	New York
Chicago	Oklahoma City, Okla.
Cleveland	Omaha, Nebr.
Dallas, Tex.	Philadelphia
Denver	Pittsburgh
Detroit	Portland, Oreg.
El Paso, Tex.	Richmond, Va.
Helena, Mont.	Salt Lake City
Houston, Tex.	San Antonio, Tex.
Kansas City, Mo.	San Francisco
Little Rock, Ark.	St. Louis
Los Angeles	
Louisville, Ky.	

Other OPM field offices are as follows:

Buffalo — Traders Bank building, room 212, Main and Swan streets.
Charlotte, N. C.—New Liberty Life building.
Cincinnati—Union Trust building, room 804.
Des Moines, Iowa — 505 Crocker building.
Jacksonville, Fla.—504 Hildebrandt building.
Milwaukee — 1124 First Wisconsin National Bank building.
Minneapolis — 240 Rand Tower building.
Newark, N. J.—176 Sussex avenue.
Seattle—National Bank of Commerce building.

"Shopping lists" of items the Army wants to buy are available at all the regional offices. These include the materials wanted under the ordnance department's new $2,888,980,486 program. The lists include shell, bombs, gun carriages, guns, gun mounts, fire control equipment, pistols, rifles and power trains —consisting of transmission, controlled differentials and final drive units—for tanks.

Necessity for producers of nondefense products to convert facilities to defense *materiel* manufacture was emphasized by OPM last week in warnings that the supplies of certain critical metals would become tighter and in limiting production of certain less essential products.

December automobile production will be curtailed 48.4 per cent below last December's output. Manufacturers will be allowed to build only 204,848 passenger units compared with 396,823 in December, 1940. Resultant steel saving will approximate 500,000 tons a month.

Domestic refrigerator output will be curtailed almost 50 per cent if a recommendation of the OPM Division of Civilian Supply is approved. Limitations on the production of washing machines, ironers, metal cabinets and similar items are expected to be imposed eventually.

While limiting the amount of nondefense production, the Supply Priorities and Allocations Board also attacked the problem from the other end and ordered expanded production of every critical material to meet the needs of the all-out defense program. SPAB instructed Donald M. Nelson, its executive director, "to leave no stone unturned by any agency of the government in the drive to bring production of the nation's basic materials up to the maximum defense and essential civilian needs."

SPAB To Push Nonferrous Metals

Immediate efforts of SPAB's program will be concentrated on aluminum, magnesium and copper. In each case, SPAB directed that expansion of capacity already planned but not actually set in motion be completed as soon as possible.

In the case of magnesium, existing plans call for expansion of production by approximately 364,000,000 pounds per year.

In aluminum, existing plans call for an increase in production of 600,000,000 pounds per year. Negotiations for the building of the new capacity are progressing well.

Expansion of copper production was called for through a broad campaign designed both to increase the available supply and to reduce the demand for the metal. SPAB estimated between 250,000 and 350,000 tons could be saved annually by cutting down on unnecessary uses.

Plans for the proposed steel capacity expansion have been taken up with OPM Director General William S. Knudsen by OPM steel experts. It was reported in Washington that the recommended increase will be approximately 13,000,000 tons of ingots.

"Urgency Numbers" Aid Machine Tool Builders

CLEVELAND

■ Some machine tool builders declare that under the recently instituted "urgency standing number" system a breakdown in the machine tool priority system that was threatened as a result of the rapid increase in the number A-1-a orders may be averted.

Under this system the orders are given "urgency standing" numbers depending on the degree of urgency involved in each order. Rating numbers at present range from 1 to 225—and they are subject to change by direction of OPM's Priority Division. For example, an urgency standing number last week was changed from 62 to 37. One of the lowest numbers, issued last week, is 8, in connection with equipment for a new ordnance plant. So that machine tool builders may have a minimum amount of order-switching to do, no priority ratings become effective until 30 or 60 days after they have been issued, depending on the particular machines involved.

Machine tool builders, in addition to having a blanket A-1-a priority rating, are authorized to make use of urgency standing numbers in placing orders for necessary parts, cutting tools and so on. This is highly important because even A-1-a orders for some cutting tools cannot be delivered in less than 20 to 26 weeks without a fairly low urgency standing number.

Up to last week it had been expected that the peak in machine tool production would be passed with completion in 1942 of the "E" bomber tooling program. That expectation now appears unlikely of consummation because of the request for an additional $6,000,000,000 under the lend-lease act. This additional lend-lease program involves a huge outlay for new machine tools.

This business cannot be expected to materialize for some time. It first will be necessary for Congress to act on the request, after which negotiations will be opened. There is an unbelievable amount of red tape and delay in transacting business under the lend-lease act. On British requirements, for example, so many moves are made that three to four months elapse between the time when the British Purchasing Commission obtains preliminary bids and the time when the final contract is issued.

Captive Coal Mines Will Reopen Under Terms of Thirty-Day Truce

■ TEMPORARY agreement was reached between representatives of the United Mine Workers of America, CIO, on strike at more than 30 captive mines, and the mining companies, it was reported by William H. Davis, chairman, National Defense Mediation Board. Operations at mines that had been closed down several days because of the strike were to be resumed for a 30-day period beginning Sept. 22.

Pact calls for acceptance of the so-called Appalachian agreement for the 30-day period, and the Mediation Board undertakes jurisdiction of the controversy. Collective bargaining negotiations will be continued by the board in an endeavor to arrive at a solution.

More than 25,000 coal miners had been reported out in the Pittsburgh district alone. Additional 18,000 had been called out simultaneously in West Virginia, Kentucky, Illinois and Tennessee.

Dispute was said to have arisen from refusal of steel companies, owners of the captive mines, to sign a closed shop agreement with the mine workers' union. Most of the collieries tied up by the strike are owned and operated by subsidiaries of United States Steel Corp., although other independent steel companies were also involved in the dispute.

Conferences which resulted in the temporary settlement were held in Washington the latter part of last week between union leaders, company officials and the National Defense Mediation Board.

Carnegie-Illinois Machinists' "Wildcat" Walkout Continues

"Wildcat" strike of machinists at the McDonald, O., plant of Carnegie-Illinois Steel Corp., Pittsburgh, continued late last week despite warnings from union headquarters in Pittsburgh that strikers were subject to dismissal for violating a contract between the union and Carnegie-Illinois.

Local union representatives, asserting the strike was unauthorized, attempted to arrange a meeting between the McDonald local officials and the plant management. Latter declared, however, that according to the contract the men should return to work before negotiations over grievances begin.

Local union men, it is reported, called the strike after a dispute over hiring of apprentices and wage adjustments. Hiring of apprentices was alleged to have cut into regular employes' overtime.

Three thousand, it is said, have been kept off their jobs by the strike. Machinists, who first ceased work, were joined by welders and workers in the plant's boiler and pipe shops. With these skilled workmen gone, it was necessary to shut down all 12 mills at the plant.

Attempts to spread the strike to other Carnegie-Illinois plants in the Mahoning valley district of Youngstown-Warren, O., met with no success.

As Truce Was Reached in Coal Strike

■ Defense Mediation Board which held hearings on the "captive" coal mine strike last week and obtained a temporary agreement whereby 43,000 miners in several states return to work Sept. 22. More than 30 mines whose product is essential to rearmament were shut down by the dispute, over the closed shop question. Shown seated, left to right: Harry M. Moses, president of several coal companies owned by United States Steel Corp.; William H. Davis, chairman of the Mediation Board; and John L. Lewis, president, United Mine Workers, CIO. Standing, left to right: Walter Teagle, former head of the Standard Oil Co. of New York, and employer member of the board; and Hugh Lyons, labor member. NEA photo

W. D. Murphy Elected President of NIAA

■ Marketing of industrial products under wartime conditions was the principal topic of discussion at the nineteenth annual meeting of the National Industrial Advertisers' Association, held at Toronto, Ont., last week. The conference was sponsored by the Industrial Advertisers' Association of Toronto, one of two Canadian chapters of the association. John A. M. Galilee, assistant advertising manager, Canadian Westinghouse Co. Ltd., was chairman of the general conference committee and Vincent R. Young, Canadian General Electric Co. Ltd., was chairman of the program committee.

Officers elected at the convention were: President, William D. Murphy, Reincke, Ellis, Younggreen & Finn Inc.; vice presidents, H. V. Mercready, Magnus Chemical Co., L. J. Ott, Ohio Brass Co., L. R. Garretson, Leeds & Northrup Co., H. Von P. Thomas, Bussman Mfg. Co., E. C. Howell, Carboloy Co. and E. A. Phoenix, Johns-Manville; secretary-treasurer, C. D. Davenport, Union Steel Products Co.

August Machine Tool Shipments Set Record

■ Machine tool shipments in August totaling $64,300,000 were the highest on record in the history of the industry, according to the National Machine Tool Builders' Association. Shipments reported for July were $57,900,000 and for June $63,000,000. In August a year ago shipments were estimated at $40,800,000.

General Preference Steel Order Revised To Simplify Filing of Forms

WASHINGTON

■ GENERAL Preference Order M-21 has been amended to make less burdensome the filing of forms by producers and purchasers of steel. One change permits the War and Navy Departments, and warehouses, to file reports of all orders in a single group classification placed during a single month on one PD-73, instead of filing a form at the time of placing each order. In each case, the form must be filed with the producer on or before the fifth of the following month.

Another revision provides that when steel is shipped by a producer direct to a customer of a warehouse, Form PD-73 is to be filed by the customer and not by the warehouse.

In the case of export sales, the amendment calls for the filing of Form PD-73 with the Iron and Steel Branch of the OPM, as well as with the producer. Amendment follows:

TITLE 32—NATIONAL DEFENSE; CHAPTER IX—OFFICE OF PRODUCTION MANAGEMENT; SUBCHAPTER B—PRIORITIES DIVISION; PART 962—STEEL.

Amendment to General Preference Order No. M-21.

(a) Paragraph (b) (13) (i) of Section 962.1. (General Preference Order No. M-21) is hereby amended to read as follows:

"No Producer of Steel shall make, and no Person shall accept from a Producer, delivery of Steel unless and until a statement on Form PD-73 or in such other form as may from time to time be prescribed by the Director of Priorities has been filed as follows:

"(a) Except as hereinafter provided, each purchaser shall file Form PD-73 with the Producer at the time of filing his purchase order or contract.

"(b) On orders placed prior to Sept. 1, 1941, with deliveries to be made after Sept. 1, 1941, Form PD-73 shall be filed with the Producer on or before Oct. 15, 1941.

"(c) On all export sales as defined in group E of Form PD-73, Form PD-73 shall be filed not only with the Producer but also with the Iron and Steel Branch, Office of Production Management.

"(d) On all export sales as defined in group E of Form PD-73 (except sales to purchasers in the Dominion of Canada) where orders are placed prior to Dec. 1, 1941, Form PD-73 may be filed by the accredited agent or export division of the Producer in the United States.

"(e) When Steel is shipped by a Producer direct to the customer of a Warehouse, Form PD-73 is to be filed with the Producer by the customer and not by the Warehouse.

"(f) When the purchaser is the War Department or Navy Department, or a Warehouse, the purchaser may report on a single Form PD-73 all orders in a single group classification placed during a single month. In such case each Form PD-73 must be filed with the Producer on or before the fifth day of the following month."

(b) This amendment shall take effect immediately.

Issued this 9th day of September, 1941.

Donald M. Nelson,
Director of Priorities.

To All Producers and Purchasers of Steel:

Subject: General Preference Order M-21.

Gentlemen:

General Preference Order M-21 has been amended in minor respects to establish a more liberal procedure in connection with Form PD-73. We have received numerous inquiries about the precedure under the Order, and for the information of those interested, the questions which up to now have been most frequently raised are answered below:

(1)

Persons Who Must File PD-73 and Time of Filing

(a) On all orders placed after Sept. 1, 1941, Form PD-73 shall be filed with the producer when the order is placed.

(b) On all orders placed prior to Sept. 1, 1941, with deliveries to be made after Sept. 1, 1941, Form PD-73 shall be filed with the producer on or before Oct. 15, 1941. However, we are earnestly requesting that every purchaser of steel file with his producer, as soon as possible, PD-73 to cover all orders placed prior to Sept. 1. We are asking for all customers' co-operation in this matter, because we are demanding that the steel producers give us a report covering their September shipments on the basis of the Group Classifications, and it will be necessary for the producers to have the proper classifications on orders placed prior to Sept. 1, if they are to give us a true picture of their shipments for the month of September.

(c) Where steel is shipped by a producer direct to a customer of a warehouse or jobber, Form PD-73 is to be filed with the producer by the customer, not by the warehouse or jobber.

(d) A customer may file one Form PD-73 to cover more than one order placed on the same date with a producer if all material is for the same group classification.

(e) Warehouses. A warehouse may file with a producer a single Form PD-73 covering all orders in a single group classification placed with such producer during any calendar month. Each such Form PD-73 must be filed with the producer on or before the fifth day of the following month.

(f) Army and Navy. A similar procedure may be followed when the purchaser is the United States Army or Navy.

(g) Export Sales. On export orders (except Canadian) now on the books of a producer or placed prior to Dec. 1, 1941, Form PD-73 may be filed by the accredited agent or export division of the producer in the United States. On orders placed on or after Dec. 1, 1941, Form PD-73 must be filed by the purchaser with his order.

(2)

For further clarification, listed below is a breakdown of certain of the Product Classifications, itemizing those products for which PD-73 must be filed by a purchaser. All the other products under the Product Classification seem to be clearly defined and need no further explanation.

Product No. (6) "Tie Plates and Track Accessories Including Track Spikes"—This means and includes for the purpose of filing PD-73, tie plates, track spikes, splice bars and rail joints.

Product No. (11) "Pipe and Tubes"—This means and includes all pipe and tubes, except conduit.

Product No. 13 "Wire and Wire Products Including Fence Posts"—This means and includes wire, woven fence wire, barbed wire, nails, staples, bail ties, fence posts, gates.

Product No. (20) "Tool Steel Bars"—This means and includes high speed steel.

Product No. (23) "Forgings All Other"—This means and includes all rough forgings, whether or not these rough forgings are produced by a steel producer or by an independent forging company who purchases steel in order to produce forgings in its own plant.

Product No. (24) "Steel Castings"—This means and includes only all rough steel castings.

(3)

Preferred Deliveries

Paragraph (b) (7) of the Steel Order requires acceptance and fulfillment of defense orders in preference to other orders. The Group Classifications on Form PD-73 do not constitute preference ratings.

Form PD-73 is for purposes of information and classification of steel shipments. PD-73 does not relieve a purchaser from any obligation with respect to Preference

Rating Certificates and their proper use.

(4)

Records

Records must be preserved for at least two years by all persons affected by the Order. This includes purchasers as well as producers.

(5)

Producers of steel who cannot clearly identify the ultimate use of the material under groups A to G, inclusive, will class these orders under Group H. For example, a person who buys steel to produce "off the shelf" products and cannot determine the ultimate destination of these finished products, and also is not covered by the Defense Supplies Rating Plan, or other orders issued by the Director of Priorities must classify his purchases under "H." A statement from a purchaser of steel that a large percentage of his finished products are used in defense, or that they expect to obtain a preference rating in the near future, cannot be used to classify the customers' orders on Form PD-73. Such orders would be classified in "H."

(6)

Group G—OPACS. Orders in this group must carry a preference rating certificate with a "B" rating, or other various specific identification from the Director of Priorities that the material is for essential civilian supply. Because a manufacturer is not producing products for defense does not allow him to group his orders under "G."

(7)

All purchases of steel, seconds as well as primes, are to be reported in Form PD-73.

(8)

Under this Order it is necessary for many companies to file Form PD-73 when they place an order for steel, and in turn, their customers must file a PD-73 Form with them to cover purchases of this company's products. The reason for this is that as steel is defined under this Order, and covered by the Product Classifications, it is obligatory on the part of the companies so affected to both file and receive Form PD-73.

(9)

All the above information, and the answers to nearly all the other questions received, are contained in the Order and instructions. As the burden of answering individual inquiries is heavy, we urge that, before addressing questions to this office, you read carefully the material already sent you. Your regular supplier should also be able to assist you with information as to procedure.

Very truly yours,

(Sgd.) A. D. WHITESIDE, Chief
Iron and Steel Branch
Materials Division

Supplementary Order Adds Specific Regulations Over Alloy Steels

WASHINGTON

■ SUPPLEMENTARY order providing additional specific regulations over alloy steel, alloy iron, and wrought iron has been issued by the Priorities Division.

The new order is Supplementary Order M-21-a.

Alloy steel of all kinds is already subject to priority control under the terms of General Preference Order M-21. However, the present order includes a definition of alloy steel and alloy iron and specifically authorizes the Director of Priorities to issue directions to any producer as to deliveries he may make or the kinds of alloys he may produce.

Order stipulates that deliveries under toll agreements—now in effect or to be entered into—must be specifically authorized by the Director of Priorities.

The supplementary order also revokes General Preference Order M-5, Supplementary Order M-5-a and Supplementary Order M-5-b, all relating to nickel-bearing steel which is now included under orders M-21 and M-21-a.

The text of the order is as follows:

TITLE 32 — NATIONAL DEFENSE; CHAPTER IX — OFFICE OF PRODUCTION MANAGEMENT; Subchapter B — PRIORITIES DIVISION; Part 962—STEEL; SUPPLEMENTARY ORDER NO. M-21-a RELATING TO ALLOY IRON, ALLOY STEEL AND WROUGHT IRON

962.2 Supplementary Order.

(a) Definition. For the purposes of this Order, "Alloy Steel" means any steel, and "Alloy Iron" means any iron, containing any one or more of the following elements in the following amounts:

Manganese in excess of 1.65%

Silicon in excess of 0.60%

Copper in excess of 0.60%

Aluminum, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium or any other alloying element in any amount specified or known to have been added to obtain a desired alloying effect.

(b) Priority Control. All the provisions and definitions of General Preference Order M-21, issued Aug. 9, 1941, and of Priorities Regulation No. 1, issued Aug. 27, 1941, as amended from time to time, shall be applicable to alloy iron, alloy steel and wrought iron and are hereby included as a part of this Order with the same effect as if specifically set forth herein, except as otherwise specifically provided herein.

(c) Directions as to Deliveries and as to Alloying Content. The Director of Priorities may from time to time issue directions to any Producer, directing or forbidding specific deliveries, or specifying as to any alloying element the quantities and proportions which may be used in making alloy iron or alloy steel, and whether, and in what proportions, any such element is to be the metal, a ferro-alloy, reclaimed metal, scrap, a chemical compound or any other material containing such element. A Producer who shall violate any such direction, or any person who knowingly receives delivery of alloy iron or alloy steel in violation thereof, may be prohibited from making or receiving further deliveries of such material or subjected to such other action as the Director of Priorities may deem appropriate.

(d) Restriction of Deliveries under Toll Agreements. No person shall make any delivery under any contract now outstanding or hereafter entered into for the delivery of alloy steel which he processes, fabricates or casts by toll agreement for any other person, unless specifically authorized to do so by the Director of Priorities.

(e) Revocation of General Preference Order M-5. General Preference Order M-5, as amended, Supplementary Order M-5-a, as amended, and Supplementary Order M-5-b, issued to conserve the supply and direct the distribution of nickel-bearing steel, are hereby revoked, effective as of the effective date of this Supplementary Order.

(f) General Preference Order M-14 Still Effective. Nothing contained herein shall be construed to amend or modify any of the provisions of General Preference Order M-14, to conserve the supply and direct the distribution and use of tungsten in high-speed steel.

(g) Effective Dates. This Supplementary Order shall take effect on the 16th day of September, 1941, and, unless sooner terminated by direction of the Director of Priorities, shall expire on the 30th day of November, 1941.

Issued this 16th day of September, 1941.

Donald M. Nelson,
Director of Priorities

By-Product Coke Prices "Frozen" At Current Levels

WASHINGTON

■ PRICES for by-product foundry coke and by-product furnace coke were frozen at approximately current levels in price schedule No. 29 announced last week by Leon Henderson, OPA Administrator.

New schedule will go into effect Oct. 1. Move is considered essential to continued stability of the iron and steel price structure. Only by-product foundry and furnace coke are covered by present schedule. Mr. Henderson said prompt action will be taken to establish ceiling prices for beehive, domestic or other kinds of coke, when and if it becomes necessary.

Beehive coke, in particular, is subject of study by OPA to determine relationship between price and available supply. Cost changes in industry and demand for beehive coke over remainder of 1941 are among principal points being looked into. Prices of by-product furnace coke and by-product foundry coke are now from $1 to $1.25 a ton above levels prevailing a year ago.

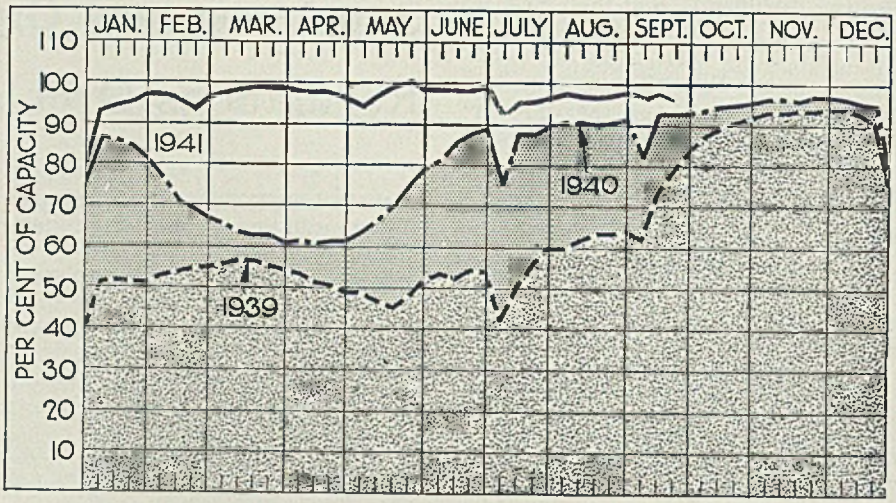
Because further upward movement in coke prices would exert disturbing influence on prices for iron and steel products, Mr. Henderson said it has become necessary to set maximum prices. Establishment of ceiling prices on by-product furnace coke and by-product foundry coke follows extensive consultation with members of the industry.

Existing price structure, which, in effect, is maintained in OPA schedule, was stated by producers to be satisfactory and many of their suggestions as to regional differentials and trade practices have been followed.

August Gear Sales Index Down 22 Points to 276

■ Industrial gear sales in August were down from July but were 44.5 per cent greater than in July, 1940, according to the American Gear Manufacturers Association, Wilkinsburg, Pa. Sales for eight months this year were 109 per cent above the corresponding period last year.

Comparative index figure of sales for August was 276, down 22 points from July and compared with 191 in August, 1940. The high point was 299 in June. The index is based on 1928 as 100. The compilation applies only to industrial gears.



PRODUCTION . . . . Down

■ PRODUCTION of open-hearth, bessemer and electric furnace ingots last week declined ½-point to 96 per cent. Two districts made slight advances, four were lower and six were unchanged. A year ago the rate was 93 per cent; two years ago it was 79½ per cent.

Youngstown, O.—With 76 open hearths and three bessemers in production the operating rate was unchanged at 98 per cent. Finishing mill output was cut by a strike at Carnegie-Illinois plant at McDonald, O.

Detroit—Advanced 1 point to 95 per cent.

St. Louis—Held at 98 per cent, which may be increased as result of hot metal from Granite City Pig Iron Co. stack blown in last week.

Cincinnati—Dropped 1 point to 88 per cent. Open hearth repairs will continue the same rate this week.

Birmingham, Ala.—Unchanged at 95 per cent, with 23 open hearths in production.

Cleveland—Addition of an open hearth raised the rate 2½ points to 94½ per cent.

Chicago—Lost 1 point to 100 per cent. Two plants held their rate and four eased slightly, necessity for repairs to furnaces being the cause. Wisconsin Steel Co. lighted one of two 150-ton open hearths last week.

Central eastern seaboard — Remained steady at 95 per cent.

Buffalo — Production last week continued at 90½ per cent.

New England—While production last week was unchanged at 90 per cent the rate will be higher this week as a repaired open hearth resumes.

Pittsburgh—Loss of 1 point to 98 per cent resulted from temporary strike interruption at coke plants.

Wheeling—Decline of 8 points to 86 per cent, because of labor difficulties.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Sept. 20	Change	Same week 1940	Same week 1939
Pittsburgh	98	— 1	88.5	75
Chicago	100	— 1	98.5	78.5
Eastern Pa.	95	None	92	59
Youngstown	98	None	83	82
Wheeling	86	— 8	97	88
Cleveland	94.5	+ 2.5	88	84
Buffalo	90.5	None	90.5	72
Birmingham	95	None	97	83
New England	90	None	80	80
Cincinnati	88	— 1	79	71.5
St. Louis	98	None	80	66.5
Detroit	95	+ 1	91	99
Average	96	— 0.5	93	79.5

Dedicate New Tool Plant at Chambersburg

■ Chambersburg Engineering Co., Chambersburg, Pa., dedicated its new plant extension, known as shop 330, on Friday, Sept. 19, in the presence of ranking Navy officials and civic authorities.

The new plant, which is devoted to the production of 5-inch horizontal boring, drilling and milling machines under a subcontract with William Sellers & Co. Inc., Philadelphia, is 87 x 300 feet with a 60 x 90-foot cleaning and painting bay. Ground was broken Dec. 5, 1940, the building completed April 8, 1941, and production started on May 1. Dedication ceremonies marked the completion of the first machine.

■ A new battery of 76 coke ovens at Ironton, O. will be put into operation Nov. 1 by the Semet-Solvay Co., turning out domestic coke.

Machine Tool Dealers Find Selling Job Complicated by Arms Program

■ MEETING at The Homestead, Hot Springs, Va., Sept. 12 and 13, more than 100 members of Associated Machine Tool Dealers of America devoted the major part of their annual convention to consideration of the many problems of getting machines to vital defense industries.

One of the guest speakers, Tell Berna, general manager, National Machine Tool Builders' Association, drew interesting comparisons between the simple procedure involved in the marketing of early machine tools and the complex sales engineering problems associated with modern high production, high accuracy machine tools and all the special tooling which goes with them on interchangeable manufacturing projects.

Mr. Berna read a message from Frederick V. Geier, president, National Machine Tool Builders' Association, in which it was pointed out that for a number of years capital consumption has outstripped its replacement through savings or new issues, resulting in use of over-age equipment to an unwholesome degree. Mr. Geier predicted that in the post-war era, in addition to the discovery and creation of new markets, selling efforts will have to be concentrated to a greater degree than ever before upon financial and managerial powers at machine tool buying sources.

Face Dual Selling Problem

One particular phase of the complications introduced into machine tool marketing by engineering developments was stressed by Dan Harrington, Wilson-Brown Co., New York, in his paper on electric motor and control installations as they affect machine tool dealers. The rise of electrification has complicated not only the sales engineering picture, but also has made a dual problem of selling. In many cases dealers have to put in as much time "selling" the kind of electrical equipment with which the machine tool builder prefers to equip his machines as they do on selling the basic machines. This introduces questions of equitable apportionment of commission on the electrical apparatus—a subject on which there is much discussion just at this time between builders, dealers and electrical manufacturers.

Due to the exigencies of the defense program, users are unable to get exactly the kind of electrical equipment which they have been in the habit of specifying. When necessary substitutions are made, the dealer in many cases is responsible not only for locating suitable substitute apparatus in his territory but also has to spend a lot of time in making it clear to the customers why the substitutions have become necessary. Sometimes he gets paid for this extra service, then again he does not.

A paper by N. P. Lloyd, Lloyd & Arms Inc., Philadelphia, dealt with suggested terms of sales payment to suit existing conditions. He pointed out that payment 30 days after delivery—especially on big defense orders—imposes a heavy financial load both on builders and dealers. He suggested that payments should begin with the placing of the order, rather than subsequent to delivery, in many instances, especially where special design and tooling are involved.

Pictures America's Future

Other speakers included A. B. Einig, tools section, Office of Production Management, Washington, who spoke informally on progress of the defense program, and E. C. Brandt, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., who delivered the address at the annual dinner. Mr. Brandt drew a vivid picture of what the productive power of the United States will mean in determining the outcome of the war and in rebuilding a war-torn world after the conflict is over.

He believes American inventive and productive genius will lead to general introduction of many new things of which we now have little or no realization but for which there will be demands comparable to recent demands for mechanical refrigerators, radios and automobiles. In that, he believes lie bright hopes for America's industrial future.

Fred B. Scott Jr., Syracuse Supply Co., Syracuse, N. Y., was re-elected president of the association, and Albert M. Stedfast, Stedfast & Roulston Inc., Boston, was re-elected vice president. A new office, that of second vice president, was created, and L. H. Pratt, Henry Prentiss & Co. Inc., New York, was elected to fill it.

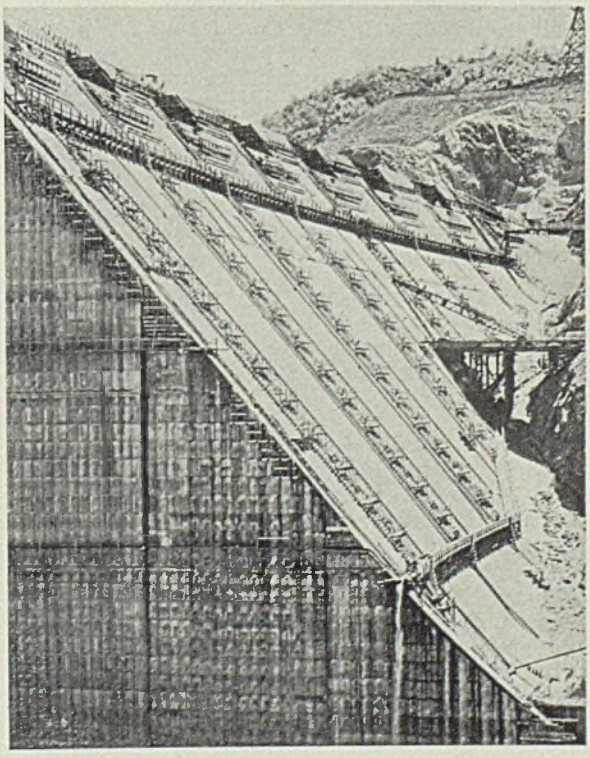
George J. Zimmerman, Strong, Carlisle & Hammond Co., Cleveland, was elected secretary-treasurer. George A. Fernly and Thomas A. Fernly Jr., Philadelphia, were reappointed advisory secretary and executive secretary, respectively.

George Habicht, Marshall & Huschart Machinery Co., Chicago, was elected to the executive committee to fill a term expiring in 1942. George E. Young, C. H. Gosiger Machinery Co., Dayton, O.; R. L. Giebel, Giebel Machine Tool Co., New York; and J. M. Riodan Riodan Machinery Co., Detroit, were each elected for three-year terms.

✦

Shasta Dam Takes Shape

■ Some conception of the immensity of Shasta dam, now under construction by the Bureau of Reclamation on the Sacramento river, can be gleaned from the apparent size of the men walking about the scaffolding across its steel reinforced concrete face. The workmen are so tiny as to be almost indistinguishable. NEA photo



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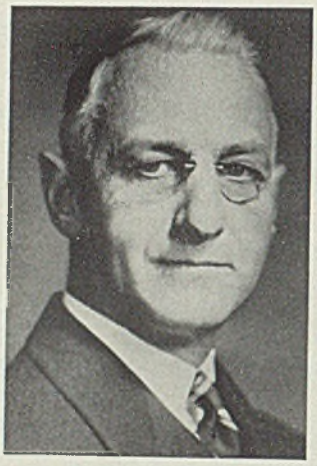


Dean R. Wilson

J. Hugo Smith

■ **DEAN R. WILSON** has been appointed purchasing agent, Warren, O., plant of Copperweld Steel Co., Glassport, Pa. Active in the steel industry many years, Mr. Wilson at one time was vice president, Carbon Steel Co., and president, Anchor Drawn Steel Co.

♦

J. Hugo Smith, founder and president, Wesson Co., Detroit, manufacturer of tungsten carbide and high speed cutting tools, has retired. At a surprise farewell party given by employes Sept. 6, Mr. Smith was presented with a six-foot model of the old tea trade sailing vessel "The Southern Cross".

♦

J. J. Schriner has resigned as president, Globe Steel Barrel Co., Cleveland.

♦

W. E. Miller, a member of Westinghouse Electric & Mfg. Co.'s legal staff 27 years, has been placed in charge of the Pittsburgh office of the Westinghouse law department.

♦

Daniel Simonds has been elected chairman of the board, Simonds Saw & Steel Co., Fitchburg, Mass. **Gifford K. Simonds Jr.** has been elected general manager.

♦

Robert E. Bressler has been elected vice president and general manager, Kol-Master Corp., Oregon, Ill., in addition to his duties as chief engineer.

♦

Lawrence K. Blackman, assistant treasurer, Farrel-Birmingham Co. Inc., Buffalo, has retired after 43 years of continuous service with the company.

♦

Henry A. Strow has been appointed chief chemist, MacDermid Inc., Waterbury, Conn., manufacturer of compounds and processes for cleaning of basic metals. After graduation from Purdue University, Mr. Strow was employed by the Udylite Corp. as research chemist, and more recently as maintenance service engineer, Detroit Transmission Division of General Motors Corp., Detroit.

♦

Kenneth R. Blake has been appointed chief engineer, Kaydon Engineering Corp., Muskegon, Mich., manufacturer of special bearings and equipment.

♦

Chester L. Jones, president, Highland Iron & Steel Co., Terre Haute, Ind., has been elected a director, Chicago & Eastern Illinois railroad, Chicago.

♦

Frank Wiethoff, the past two years vice president and general manager, Chrysler New York Co. Inc., New York, has been elected president, to succeed **William D. Stewart,** retired.

♦

B. E. Middleton, formerly Chicago representative for McKenna Metals Co., Latrobe, Pa., has been appointed representative in the central New York territory, with headquarters at 217 East avenue, Rochester, N. Y.

♦

R. M. Marshall has been elected chairman of the board, Kerchner, Marshall & Co., Pittsburgh. Other officers elected are: President, **W. A. Brown;** vice president and secretary, **E. E. Gaub;** treasurer, **Margaret C. Nedamyer.**

♦

N. H. Keyser has joined the research staff at Battelle Memorial Institute, Columbus, O., and has been assigned to metallurgical research. A June graduate of Antioch College, Mr. Keyser is a member, American Society for Metals.

♦

Robert L. Stevens, associated with Bell Aircraft Corp., Buffalo, since February, as assistant to works manager, has been appointed plant engineer, succeeding **Henry K. Beebe Sr.,** resigned. Assisting Mr. Stevens will be **George Carson,** with the company since 1938.

♦

L. W. Downey has been appointed superintendent of automotive equipment, Rock Island Lines, Chicago. In this newly created post, he will be responsible for maintenance of all of the railroad's diesel and other automotive equipment.

♦

Donald G. Dunn, sales promotion and advertising manager, Reynolds Metals Co. Inc., Richmond, Va., has been appointed assistant to vice president and general sales manager, **J. Louis Reynolds.** Mr. Dunn has been associated with the company since July, 1938.

♦

Harry G. Johnson has been appointed territorial salesman in Indianapolis by Manning, Maxwell & Moore Inc., Bridgeport, Conn. Mr. Johnson will cover the area formerly handled by **Gerald Beebe,** who has been granted a leave of absence due to illness.

♦

Marshall E. Marcellus recently was presented with the first 55-year service button ever awarded by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Now 67, Mr. Marcellus started with Westinghouse as a messenger boy in 1886, the year the company was founded.

♦

Gerald B. Duff has been appointed representative in metropolitan New York and northeastern Pennsylvania for Drever Co., designer and builder of industrial heat treating equipment. He will maintain offices at 68 Clinton avenue, Newark, N. J.

♦

Arthur P. Kroeger, assistant general manager, Los Angeles branch, Monsanto Chemical Co., St. Louis, has been transferred to St. Louis as assistant manager of sales in charge of intermediates; **Charles L. Fetz-**

INDUSTRY

Clarence E. Scott

Otto W. Winter

ner has been transferred from the San Francisco office to Los Angeles, replacing Mr. Kroeger.

♦

Clarence E. Scott has been appointed sales manager, Air Conditioning Division, Fedders Mfg. Co. Inc., Buffalo, succeeding **Edmund R. Walker,** who has become assistant general manager. Until recently Mr. Scott was manager, radiation and unit heater department, Warren Webster Co.

♦

M. M. Roberts has been appointed advertising and merchandising manager, Hudson Motor Car Co., Detroit. **H. O. Ward** recently resigned as advertising manager. Associated with the automobile industry since 1916, Mr. Roberts joined the Hudson company in 1934, and since November, 1940, had been in charge of all merchandising activities.

♦

William G. Crook has become assistant manager of sales in charge of the Buffalo office of Carnegie-Illinois Steel Corp., succeeding **Charles E. McIntyre,** recently transferred to Detroit. Since April, 1940, Mr. Crook was identified with the Boston office and before that was assistant manager of sales at Hartford, Conn.

Paul F. Vander Lippe has been named assistant to manager of sales in charge of the Kansas City office of Carnegie-Illinos. He succeeds **Howard J. Mullin,** also transferred to Detroit.

♦

Ray P. Tennes, the past seven years secretary-treasurer and a director, Shafer Bearing Corp., Chicago, has been elected chairman of the board. He succeeds his father, the late M. J. Tennes. Mr. Tennes will continue as treasurer. **W. L. Kinnaw,** comptroller, has been elected assistant treasurer-assistant secretary. **M. J. Tennes Jr.,** president, is now on leave of absence, serving as captain in the United States Army Air Corps, and **J. F. Ditzell** is vice president and general manager.

♦

Otto W. Winter will assume the duties of vice president in charge of manufacturing, Republic Drill & Tool Co., Chicago, newly organized to manufacture high speed twist drills, effective Oct. 1. He has also been elected a director of the company. The past four years Mr. Winter has served as factory manager, Columbus McKinnon Chain Corp. and its subsidiary, Chisholm Moore Hoist Corp., Tonawanda, N. Y. Mr. Winter is first vice president, American Society of Tool Engineers, national chairman of that society's emergency defense training committee and a member of the educational committee. He is also a member, American Society for Metals, American Welding Society and others.

♦

Leigh E. St. John, heretofore assistant plant engineer at the Endicott, N. Y., plant of International Business Machines Corp., has been promoted to plant engineer. **Samuel E. Lenox** has been made supervisor of the planning department at Endicott, while **Henry J. Jamieson** has become assistant planning supervisor. **Earl F. Gilliam** has been made supervisor of inspection, and he is succeeded in his former position by **Walter H. Blake,** who has been named foreman, subassembly and unit inspection department.

♦

Purchasing Agents' Association of Pittsburgh opened its 1941-42 season Sept. 16 with a talk on general preference order M-21 by **Stanley B. Adams,** Office of Production Management, Washington. The meeting was the first at which the new officers presided, and new committee chairmen were introduced.

Officers are: President, **H. R. Michel,** Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; vice president, **P. B. Zoeller,** A. M. Byers Co., Pittsburgh; treasurer, **E. C. Buerkle,** National Bearing Metals Corp., Pittsburgh; secretary, **C. H. Rindfuss,** Pittsburgh Screw & Bolt Co., Pittsburgh; national director, **L. M. Potter,** Vanadium-Alloys Steel Co., Latrobe, Pa.

Chairmen of standing committees for the coming year are: Program, **P. B. Zoeller,** A. M. Byers Co.; membership, **R. O. Keefer,** Aluminum Co. of America; entertainment, **A. W. Anderson,** Kerotest Mfg. Co.; auditing, **John C. Burry,** Carnegie Institute of Technology; reception, **George E. Kastlehun,** Pennsylvania Electric Coil Co.; fuel oil, **Albion Bindley,** Pittsburgh Steel Co.; coal, **J. H. Phillips,** Pittsburgh Steel Co.

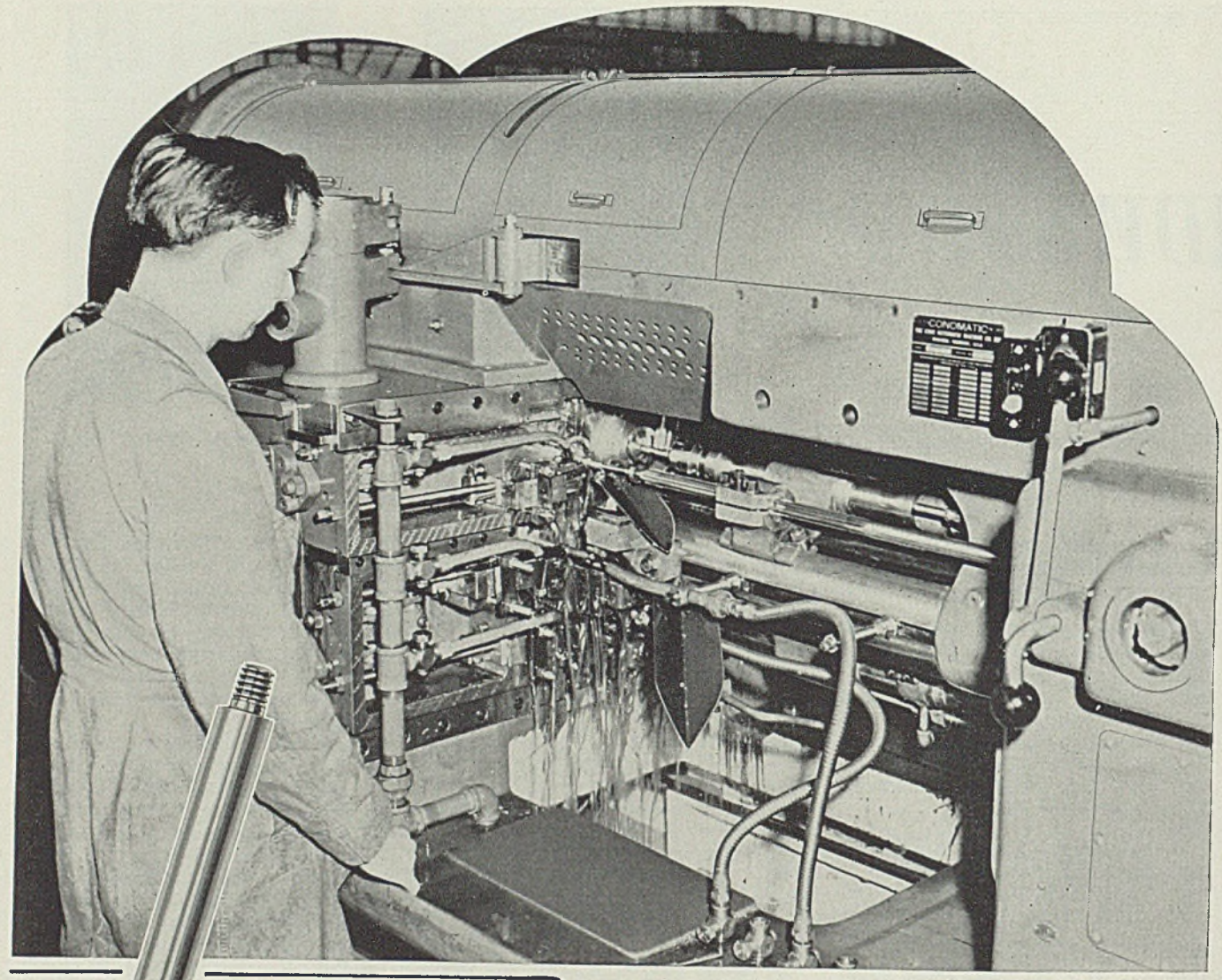
♦

David L. Wilkoff, D. L. Wilkoff Co., Pittsburgh, has been elected president, Pittsburgh chapter, Institute of Scrap Iron and Steel Inc. Other officers are: Vice president, **Amos Bowman,** Luria Bros. & Co., Pittsburgh; secretary, **J. G. McMillan,** M. N. Landay Co., Pittsburgh; treasurer, **William L. Behm,** United Iron & Metal Co., Pittsburgh.

Officers of other chapters elected for the coming year are:

St. Louis: President, **Fred S. Fuld,** Harry Benjamin Equipment Co., St. Louis; first vice president, **Abe P. Ashner,** St. Louis; second vice president, **Charles F. Harding,** Hickman, Williams & Co. Inc., St. Louis; third vice president, **Hyman Cohen,** Standard Steel & Rail Co., St. Louis; secretary-treasurer, **Charles M. Forcheimer,** Jack R. Forcheimer & Son, St. Louis.

Philadelphia: President, **Philip Bailis,** Max Bailis & Sons, Philadelphia; vice president, **Joseph V. Bantivoglio,** Camden Iron & Metal Co., Camden, N. J.; secretary, **Marcus J. Margulies,** A. M. Wood & Co. Inc., Philadelphia; treasurer, **Harry Stave,** Stave Bros., Philadelphia.



COMBINED CUTS AND CONOMATICS

AN IDEAL COMBINATION

A 1¼" Six-Spindle Conomatic produces the 4¼" brass valve stem (at left) in 9 seconds. The 11 operations performed on this part include 4 forming cuts, 4 cuts with roller turners, 2 threading operations, and cutting off — all to close tolerances. By combining machining operations on a Conomatic, you can expect a reduction in the cost of your product — improving it without added cost — and an increase in profits. Send prints of your machine parts to Cone for a complete cost analysis. There is no obligation.

CONE AUTOMATIC MACHINE CO., INC.
WINDSOR, VERMONT, U. S. A.

Windows of WASHINGTON

OPM launches new project to increase production from existing facilities by reducing steel specifications . . . Defense Supplies Corp. buys $100,000,000 critical and strategic materials from Russian Amtorg Corp., will advance to $50,000,000 for Soviet purchases in United States . . . SPAB rejects priorities request for "national defense pipeline" . . . More efficient railroad equipment utilization asked

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ NEW OPM project designed to increase production of steel from existing facilities by reducing the number of steel specifications has been launched.

Through the co-operation of three national organizations — American Society for Testing Materials, Society of Automotive Engineers and American Iron and Steel Institute —the OPM hopes to create a national steel emergency specifications list.

Belief is that the productive capacity of the steel industry and of the manufacturing industries using steel for defense equipment can be increased materially within present facilities by concentrating production upon a reduced number of steels, particularly with respect to alloy steels.

It was announced that the purpose is not to write any new specifications but to select from existing specifications a practical minimum in order to get maximum production of planes, tanks, guns, ships and other defense equipment.

C. L. Warwick, now consultant at OPM and secretary-treasurer, American Society for Testing Metals, will head the simplification committee. SAE and Institute representatives are also included.

To Advance Russia $50,000,000 Under New Trade Contract

Defense Supplies Corp. has contracted with Amtorg Trading Corp., a United States concern owned by Russian interests, for the purchase of $100,000,000 of manganese, chromite, asbestos and platinum, it was reported last week by Jesse Jones, federal loan administrator.

Subsidiary of Reconstruction Finance Corp., the Defense Supplies organization has also agreed to advance as much as $50,000,000 to Amtorg against purchase of those materials prior to delivery. Proceeds of any such advances, it is understood, would be used to pay for supplies purchased by Russia in United States.

Ten million dollars was advanced Russia under the contract last week, according to Mr. Jones. Balance of the funds will be advanced as needed, he said.

Contract was made in compliance with a request from President Roosevelt stating "The Russian government needs dollar exchange with which to buy war supplies in United States; we need many critical and strategic materials produced in Russia, some of which we normally import from that country.

"To assist the Russian government in paying for war supplies which it wants to buy in the United States . . . and to expedite our own national defense program, I would like you to arrange through the RFC . . . for the purchase from Amtorg . . . of manganese, chromite, asbestos, platinum . . . up to the value of $100,000,000. . . ."

Appoints Committees to Help Secure Railroads' Requirements

Two committees to represent the Transportation Division in working with SPAB and OPM on matters relating to materials required for construction of railroad freight cars and steam locomotives were appointed last week, according to Ralph Budd, transportation commissioner, OEM.

Committee for the carbuilding industry: C. A. Liddle, president, Pullman-Standard Car Mfg. Co., Chicago; C. J. Hardy, president, American Car & Foundry Co., New York; Lester N. Selig, president, General-American Transportation Corp., Chicago; Edwin Hodge Jr., president, Greenville Steel Car Co., Greenville, Pa.; A. Van Hassel, president, Magor Car Corp., Passaic, N. J.; F. A. Livingston, president, Ralston Steel Car Co., East Columbus, O.; and J. F. MacEnulty, president, Pressed Steel Car Co., Pittsburgh.

Committee for the steam locomotive industry: W. K. Farrell, general purchasing agent, American Locomotive Co., New York; W. H. Harman, vice president, Baldwin Locomotive Works, Philadelphia; L. A. Larsen, vice president, Lima Locomotive Works Inc., Lima, O.; and G. W. Alcock, secretary, Locomotive Institute, New York.

Maintenance, Repair Order To Help Public Utilities

A maintenance, repair and supplies order designed to help thousands of public utilities has been issued by the Priorities Division.

The new order permits utilities covered by the plan and their suppliers to use an A-10 rating to facilitate deliveries of maintenance and repair materials and operating supplies which are vitally needed for defense and essential public services.

Utilities which may use the new order are those engaged in one or more of the following services:

(1) Supplying electric power directly or indirectly for general use by the public.

(2) Supplying gas, natural or manufactured, directly or indirectly for general use by the public.

(3) Supplying water directly or indirectly for general use by the public.

(4) Public sanitation services, but not including manufacture of public sanitation products.

(5) Supplying central steam heating directly or indirectly for general use by the public.

The A-10 rating can be used by the utility or by the supplier—subject, of course, to the limitations of the order—to obtain three classes of material:

(1) Maintenance material—needed for the upkeep of property and equipment in sound condition.

(2) Repair material—needed for

restoration of property and equipment to sound condition after wear and tear, damage, destruction or the like.

(3) Operating supplies—material essential to the operation of the utility involved and which is generally carried in the company's stores and charged to operating expenses.

The rating assigned by this order cannot be used for plant expansions or new improvements, or for expansion of the service area of the utility. However, the rating may be used in some cases to provide for connection for new consumers to existing utility system and also for materials needed to relieve serious overloads.

Mine Maintenance, Repair Supplies Get A-1-a Rating

Maintenance, repair and supplies plan to help approximately 15,000 mines boost production for defense was issued last week by Donald M. Nelson, director of priorities. Order permits mining companies to use a rating of A-1-a, highest defense rating, to expedite deliveries of materials needed for emergency repairs.

Rating of A-8 may be used by mine operators and their suppliers to obtain material required for emergency inventory purposes or for operating supplies or for ordinary maintenance work.

Special plan has been developed to administer and operate the order. Each state's governor has been asked to designate an official, preferably one dealing with mining operations, to help administer the order in his state.

A-10 Rating Granted Makers of Textile Machinery Repair Parts

Preference rating of A-10 has been granted to manufacturers of maintenance and repair parts for textile machinery under Preference Rating Order P-53, issued last week by the Priorities Division.

The manufacturer of such parts should make application for the rating upon Form PD-88, which should then be mailed to the Textile Branch, Office of Production Management, Washington.

After the producer has received a preference rating under the Textile Machinery and Equipment Maintenance and Repair Order, his suppliers may in turn require the assistance of a rating to make possible their deliveries to the producer. At the time of filing his application, the manufacturer should state the number of copies of the order which he desires to have furnished to him, so that he may apply the rating to deliveries to him by his suppliers, and to enable his suppliers in turn to apply the rating to deliveries to them by their subsuppliers. A supplier, however, may apply the rating only to material which will be physically incorporated into finished parts for maintenance and repair work. No copies of the order will be furnished by the Priorities Division directly to any supplier or subsupplier.

Weltner, Maverick Appointed Price Administration Aides

Philip Weltner, Atlanta, Ga., was appointed assistant director of the price division, OPA, last week. Mr. Weltner, consultant to the Tennessee Valley Authority on commercial utilization of research, will handle organizational problems of the price division. He will also assume responsibility for directing its work in the lumber, building materials and other important fields.

Appointment of Maury Maverick, San Antonio, Tex., as special assistant to study problems of the Office of Price Administration in connection with United States insular possessions, was announced last week by Leon Henderson, OPA administrator.

E. D. Bransome, who has served more than a year as head of the industrial advisors panel in the Labor Relations Branch of OPM's Labor Division, has resigned that position to return to Vanadium Corp., New York, as president.

Albert J. Browning, Chicago, last week was appointed special assistant to Donald M. Nelson, executive director, SPAB, and will handle various problems in connection with the SPAB program. Mr. Browning was deputy director of the purchases division, OPM, until last April. Previously he had served under Mr. Nelson in the National Defense Advisory Commission.

"National Defense Pipeline" Priorities Request Refused

Supply Priorities and Allocations Board last week declared it had received formal application for a priority rating to construct the "national defense pipeline" from New York to Texas. After careful consideration, the board reported, it reaffirmed previous decision that no plan involving immediate use of steel plate can be considered.

Ralph K. Davies, deputy oil administrator, appeared before SPAB to present the application for priorities on the needed materials, approximately 180,000 tons of steel plate and 190,000 tons of seamless steel tube.

Informing Mr. Davies steel plate cannot be spared, the board took a more favorable attitude in regard to the use of seamless tubing. Studies have indicated it would be possible to produce enough tube for at least part of the pipeline without upsetting defense requirements, if production schedules were properly adjusted to defense contracts.

OPA Issues Pig Tin Price Schedule Amendment

OPA issued an amendment to the tin price schedule last week, classifying as grade B pig tin which assays 99.80 per cent pure but contains impurities exceeding the tolerances for grade A tin. Price ceiling of 52 cents a pound for grade A tin and a discount of ⅜-cent for grade B was reported.

Price schedule No. 17 was amended by the order, fixing the following maximum prices: Grade A, 99.80 or higher percentage of purity under secretary of procurement standards, 52 cents; grade B, 99.75 to 99.79 per cent pure, inclusive, and 99.80 or higher percentage of purity not otherwise meeting grade A specifications, 51.625 cents; Cornish refined, 51.625 cents; grade D, 99.0 to 99.74 per cent pure inclusive, 51.125 cents; grade E, below 99 per cent, 51 cents for tin content.

Amendment announced the following differentials for sales in lots of less than five gross tons: In lots of 2240 to 11,199 pounds, inclusive, there may be added to the maximum prices 1 cent per pound; lots of 1000 to 2239 pounds, inclusive, 1½ cents per pound addition; 500 to 999 pounds, inclusive, 2½ cents per pound; under 500 pounds, 3 cents per pound additional.

Budd Asks More Efficient Use of Railroad Equipment

Appeal for full co-operation in obtaining more efficient utilization of existing railroad equipment to meet the transportation demand during the coming peak period was made last week by Ralph Budd, transportation commissioner, OEM. Lag in the nation's carbuilding program was pointed out by Mr. Budd in a letter to all shippers and receivers.

Scarcity of material, he said, will result in 20,000 fewer new cars in service Oct. 1 than had been anticipated by the railroads. Railroad-owned serviceable freight cars Aug. 15 totaled 1,589,203, Mr. Budd's letter declared. This was an increase of 163,383 over the number available Sept. 1, 1939.

"Since material has not been obtainable to build the new cars that were ordered," said the letter, "we must make better use of the existing ones . . . Your co-operation has been sought to the end that cars may be loaded and unloaded with the utmost speed, that equipment

may be loaded heavier and efficiency promoted by other means with which you are all familiar . . .

"During the next several weeks. . . new records in the volume of transportation rendered per unit of serviceable equipment must be made. This appeal to all users of transportation . . . to do everything in their power to prevent delay to cars while awaiting loading or unloading is made in the interest of the general welfare. A few hours and a few dollars spent in loading or unloading cars seven days a week or after usual closing time may well pay large dividends to the shippers directly involved and the country as a whole."

Priorities Division Program Facilitates Truck Production

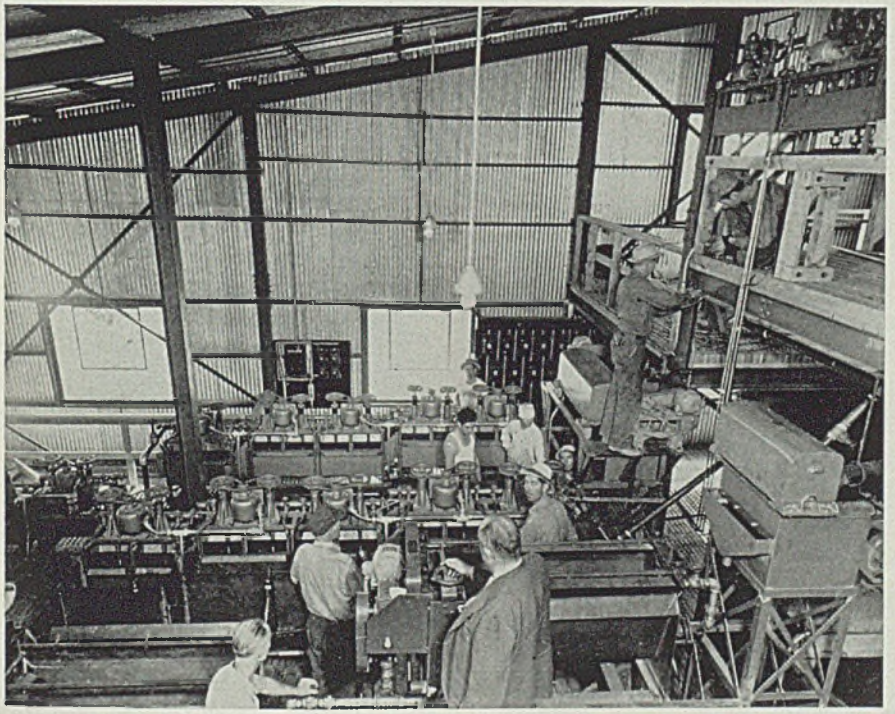
New program designed to facilitate production of heavy motor trucks, medium trucks and truck trailers vitally needed for transportation of heavy industrial and armament materials was issued last week by the Priorities Division, OPM. Plan also facilitates production of certain passenger carriers and necessary replacement parts.

Administration of the motor truck order issued Aug. 30 is amended and simplified by the new program. It makes no major changes in the plan as originally announced, but does alter methods set up to enforce and administer the order.

Two separate orders are involved in the new program. One is Limitation Order L-1-a. This includes specific instructions as to the number and kind of trucks and allied products which can be made in the period Sept. 1-Nov. 30. The other is Limited Preference Rating Order P-54, and extends a rating of A-3 which can be employed to get the material to be used in truck production to the extent provided.

Assistance extended to truck manufacturers is based on indications 1,189,000 trucks will be required during the new model year which began Aug. 1. This would be approximately 200,000 more than output in the model year ended July 31.

Pilot Plant Concentrates Native Manganese Ore



■ Definite possibility of greatly increased manganese production from domestic sources was assured last week in a report by the Bureau of Mines, which declared it has been successful in producing concentrates with high manganese content ores from low-grade deposits in the Las Vegas, Nev., area.

First unit of the comprehensive group of pilot plants built by the bureau at Boulder City, Nev., under a defense appropriation, has started operations. Test run has demonstrated applicability of a process developed for supplying a portion of defense manganese requirements from domestic sources, the report said.

First ore to pass through the Boulder City pilot plant, which has an ore capacity of 40 tons per 24-hour day, was from the nearby Las Vegas Wash mining district. Bureau engineers have estimated there is nearly a million tons of ore in this area containing more than 10 per cent manganese, and report there is more in the adjacent Virgin River district.

More than 3600 tons of the Las Vegas ore has been mined and stored at the Boulder City mill. This ore, run of mine, averages about 18 per cent manganese. Except for a small amount of high-grade material mined during the World war, this reserve of manganese ore has been undeveloped. All former attempts at concentrating it to an extent permitting its use in manufacture of ferromanganese were unsuccessful.

Product of the first operations analyzed, after sintering, 52 per cent manganese, 1 per cent iron, 9 per cent silica. Recovery from the ore was more than 70 per cent. It is thought the recovery may be increased as plant operation is further perfected.

Shown above are the flotation machines in the new pilot plant at Boulder City.

Nelson Assigns A-3 Rating to Air Line Maintenance Needs

Limited blanket rating order assuring continuous operation at a high degree of efficiency of air lines in United States was issued last week by Donald M. Nelson, director of priorities.

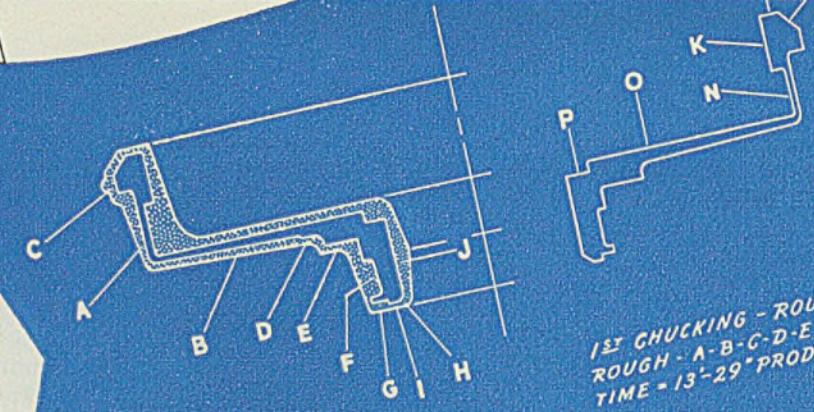
The order assigns high defense rating of A-3 to deliveries of all materials which enter into upkeep of planes and ground equipment. Air carrier or supplier of maintenance equipment and repair parts wishing to secure the assistance of the plan is directed to apply to the Priorities Division on form PD-96. Each assignment of the rating will cover a three months' period, and amounts and kinds of material so covered will be based on information furnished in the application.

Order makes provision for immediate termination of the rating assignment if it is applied by an air carrier to deliveries in excess of the amounts specifically prescribed by the Priorities Division.

Supplier may apply the rating only if materials to be delivered cannot be obtained without it. He is prohibited from using the rating to secure deliveries in greater quantities or on earlier dates than are required for delivery on schedule of the rated material, or to obtain material which will not be used by his customer for the maintenance and repair of its aircraft and equipment.

Order may be extended by an air carrier by executing a copy and furnishing it to his supplier. Supplier may follow the same procedure where necessary to secure deliveries from a subsupplier.

The Approved Way to Handle this

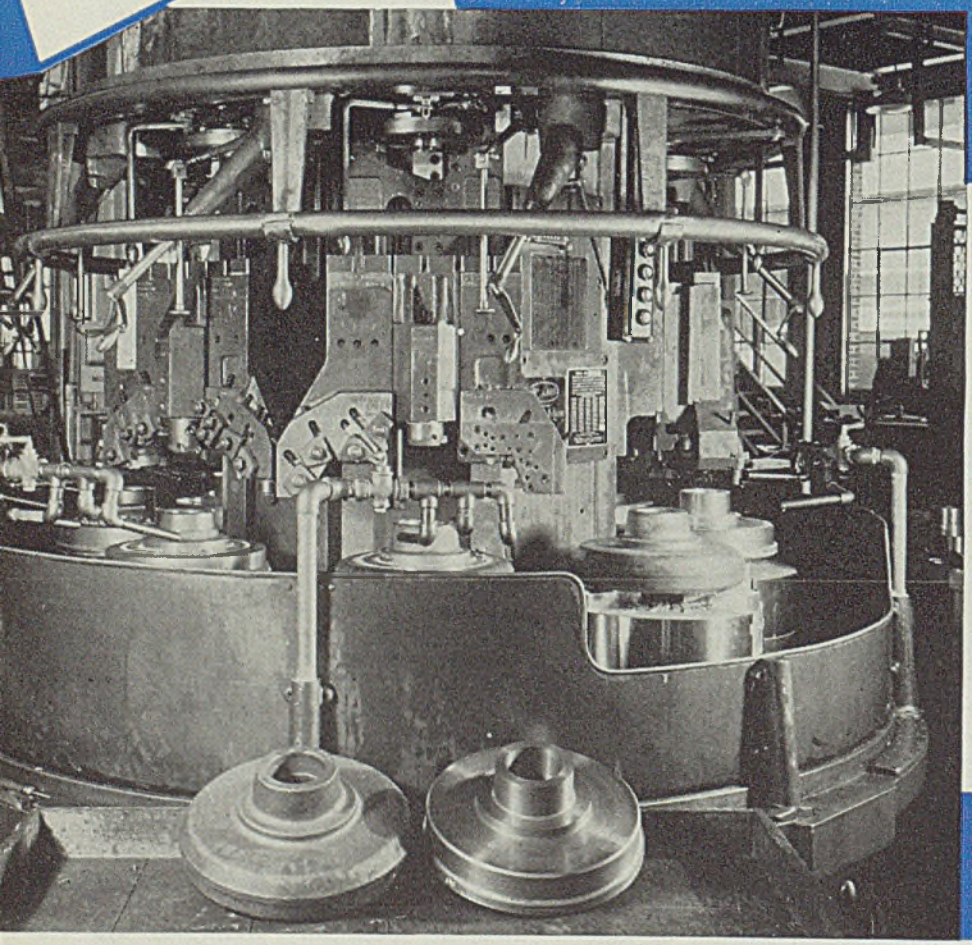


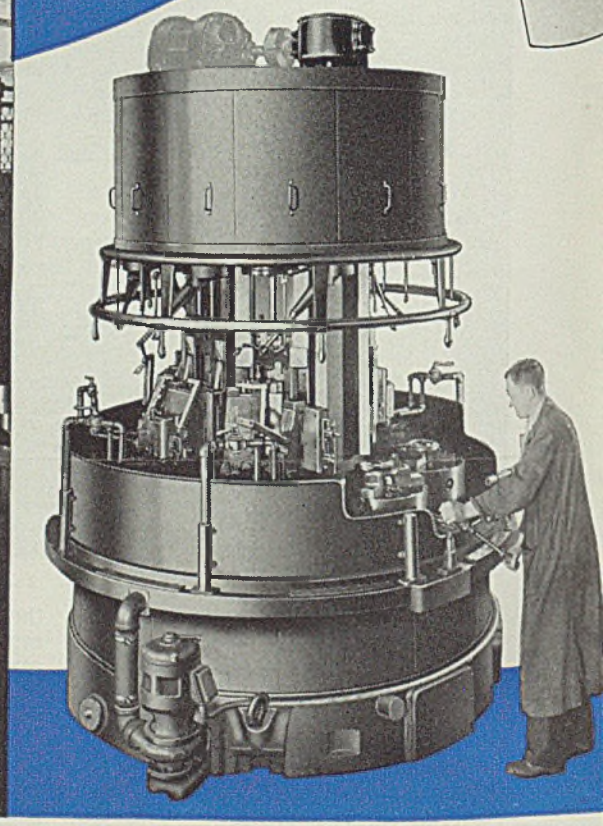
REDUCTION DRIVING GEAR
16"-8 SPD TYPE-D-MULT-AU-MATIC
3 CHUCKINGS
MAT'L CHR. MOLY ALUM STEEL
CUTTING TOOLS HIGH SPEED STEEL
45 R.P.M. AVERAGE CUTTING SPEED

1ST CHUCKING - ROUGHING
ROUGH - A-B-C-D-E-F-G-H-I-J
TIME = 13'-29" PROD. @ 85% EFF = 3.8 Pc's

2ND CHUCKING
ROUGH & FINISH - K-L-M-N-O-P
TIME 11'-36" PROD. @ 85% EFF = 4.4 Pc's

3RD CHUCKING - TIME 11'-52"
FINISH - A-B-C-D-E-F-G-H-I-J
PROD. @ 85% EFF = 4.3 Pc's





Close-up of first chucking operation

THE PROBLEM The blueprint tells the story. 16 separate and distinct surfaces to be finished on this chrome moly. alum. steel airplane engine reduction driving gear—Rapid and Extremely accurate production vital.

THE SOLUTION 3 chuckings on Bullard Type "D" 16" 8-spindle Mult-Au-Matic. The approved tool layout called for dividing the total roughing and finishing cutting operations between 72 tools on 21 different working stations.

RESULT These parts are being accurately turned out at an average rate of one every 15 minutes—a fraction of the former time.

BULLARD

The Tougher the Job, the More Bullard Can Help You

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

Mirrors of MOTORDOM

General Motors figures it could stand another billion of defense business, on basis of productive capacity for durable goods . . . Big companies, experts at subcontracting and follow-up methods, will farm out increasingly large share of defense load . . . Autos 25 cents a pound wholesale, airplane engines $15 a pound . . . GM and Ford likely builders of heavy tanks

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ SOME cold, hard facts on defense production schedules, subcontracting, materials shortages and related subjects were presented in a recent address by C. E. Wilson, president of General Motors Corp., on the occasion of the corporation's combination defense conference and new model showing. They are worthy of repetition and summary because they reflect the position of one of the country's top-ranking defense equipment producers. And while the facts were presented by Mr. Wilson, they represent a lot of research and statistical leg work by a number of men on the GM staff.

In the first place, GM has received orders for $1,200,000,000 worth of defense material and by the end of this year will have produced over one-third, not counting orders and shipments of Yellow Truck & Coach. About 90 per cent of the balance of 775 millions will be shipped in 1942.

Could Handle Twice as Much

Relating these figures to the corporation's productive capacity, it is seen that while GM has capacity to produce about 8 per cent of the total durable goods output of the country, its share of the total defense business so far awarded runs to only 4½ per cent. So, to keep in line, the corporation figures it could easily shoulder twice as much defense business as it has.

On the subject of subcontracting, Mr. Wilson points out that GM, through its operating divisions has had more experience in subcontracting than any other company in the U. S., buying hundreds of millions of dollars worth of parts and supplies from thousands of small companies. From experience, GM buyers know that subcontracts for technical parts which must be interchangeable with others can be made successfully only by those concerns understanding the importance of scheduled deliveries, reasonably familiar with the type of work and having the necessary experience, organization and facilities. Just placing orders for parts will not get the job done, as the motor industry knows only too well. There must be a competent organization to expedite purchasing, follow-up, inspection and flow of materials.

A proper understanding of these facts would silence much of the criticism of awarding so many large defense contracts to big corporations. These larger companies are better able to take care of the subcontracting quickly and efficiently than are the procurement sections of the Army or Navy, which would have to locate the smaller subcontractors to begin with, then survey their facilities and negotiate hundreds of contracts for the production of items which the service agencies would have to schedule, inspect and redistribute.

It is only a matter of time, in the opinion of Mr. Wilson, until subcontracts or orders from the primary contractors will be fanned out to the smaller plants to the extent that they have organizations and equipment capable of doing part of the job. The magnitude of the task is so great that its execution will require the entire productive capacity of the country—men, machines and management.

Consider, for example, that the present defense program calls for about 40 billion dollars worth of so-called mechanical goods—airplanes, tanks, battleships, ordnance, etc.—items using metal and requiring metal fabricating. This outlay represents roughly a two-year program of 20 billion dollars a year. Now, the total production of the durable goods industries in the period from 1935 to 1939 averaged 18 billions annually. So the defense program now is greater than the total average production of this five-year period for the peacetime durable goods requirements of the country.

Obviously to get such a whale of a job done promptly, it must be handled by executives, engineers and mechanics reasonably experienced in the planning, purchasing, material control and production of this type of material.

On the matter of material requirements of defense products (still Mr. Wilson), more man-hours of labor are required to convert a ton of material into defense products than are required to convert a ton of material into standard consumer durable goods—especially true of steel. One reason why this is true is that mechanized defense products, being of a highly technical nature, are not designed for quantity manufacture, while consumer durable goods have been developed through many years to the point where they are easy to produce and require a minimum amount of labor. Furthermore, defense materials have been designed quickly with the main object in mind of whether or not they would work and not how cheaply they could be made.

For example, 20 billion dollars worth of defense material requires about 10 million tons of steel, while 18 billion dollars worth of durable consumer goods requires about 27 million tons of steel. To state the problem in other words, the average cost of automobiles at wholesale is less than 25 cents a pound, while the cost of airplanes and airplane engines is $5 to $15 a pound, heavy tonnage items like tanks and battleships $1 a pound, machine guns and ordnance $5 to $10 a pound, and even simple items like shells 25 to 50 cents a pound.

Four Reasons Cited for Shortages of Materials

Present apparent shortages of raw materials are due to four principal factors, in the estimation of the General Motors executive:

1. Stimulation of demand for dur-

able consumer goods above the prewar levels due to increased national income and to fear of increased prices and possible failure of supply. (Manufacturers have done little in the past year to assuage such fears, incidentally.—Ed.)

2. Increased work in process inventories required to get defense materials into production, and increased inventories caused by the new forms of material required by the defense program. (It has been stated that inventories of 4 tons of material must be acquired before production of the first ton of defense equipment can start.)

3. Advance purchasing to protect prices and deliveries both for defense and consumer production.

4. Priorities for materials for defense production where the material is not immediately needed for fabrication and resulting in unbalanced and increased inventories. (Shipbuilding yards in some cases are reported to be trying to obtain two-year inventories of ship plates and other steel, even before a keel is laid.)

More Tank Contracts Are Pending with Auto Plants

Among possibilities for new defense orders to be awarded the automotive industry are some for heavy tanks, possibly of the 50-ton variety. General Motors has revealed it will build tanks eventually, though no contracts have been placed and no announcements made of what division will handle the work. Electromotive Corp. in La Grange, Ill., might be the logical plant into which to place such heavy work, although it is possible Fisher Body could accommodate in some of its plants.

Ford Motor Co. also is reported to be planning production of tanks, and a part of the output of the new steel foundry to be erected at the Rouge plant, described here last week, may be for this purpose.

Two new airplane engines from the designing boards of automobile companies have appeared in recent weeks, one from Ford and one from General Motors. The former is a liquid-cooled 8-cylinder opposed-type pancake motor, now in preliminary stages. The latter is a 4-cylinder X-shaped two-cycle engine, weighing about 400 pounds and rated at 200 horsepower maximum. The engine has been under development for several years and some are being flown in test planes now.

Refinements on 1942 Models Are Plentiful

Buick has announced six new lines of cars for 1942, on wheelbases varying from 118 to 139 inches, and with engines in three power ratings from 110 to 165 horsepower, compound carburetion being continued as standard on all engines except the lowest rated unit.

Exceptional advances in style treatment, common to all General Motors lines for 1942, are emphasized in the Buick cars by two wide bands of bright metal, extending across front and rear fenders on some models, and along the full length of the car on others. Front fenders are carried across front doors on all models and in the 50 and 70 series convertibles and sedanets stream completely through the door to join the rear fender at the shield line.

Hoods are extended closer to the windshield by removal of the cowl ventilator, fresh air now being taken through intakes behind the radiator grille and directed through ducts to outlets beneath the dash.

Coil springs on series 50 and 70 models have a "softer" rate and are located ahead of the rear axle instead of over it.

Both front and rear bumpers are curved around corners of the car and extended along the side for about 10 inches. They are of heavier and more massive design, with license plate frames integral front and rear.

Hoods are one-piece, opening at either side, and, outside of steel roof panels, represent probably the largest automotive steel stampings ever attempted, having a considerably deeper draw than those used on last year's models. Buick prices, starting at $1046, are up from 8.9 to 15.9 per cent, average increase being $138 or 12.3 per cent.

Nash has introduced three new series of five models each—the low-price 600 and the regular six and eight models. Front-end style treatment is entirely new in all models; mechanical and structural details show little change from previous models. Sales emphasis will be placed on the 600 series, from the price and economy angle.

Dodge enters its twenty-eighth new model season with a line of 11 passenger cars, powered by a 105-horsepower engine, up from 91 horsepower last year by virtue of ⅛-inch increase in bore. Radiator grille is larger and wider, extending the full distance between headlights and combining with a heavier bumper section to give a more massive front end appearance.

Radiator grille treatment on the 1942 Chrysler line also is distinctive, comprising five horizontal bars of bright metal extending the full width of the front end and curving across fender noses beneath headlights. Air scoops are integral parts of the front bumper design. For the novelty, the car name has been omitted from hub caps on some Chrysler models, the line comprising six models and 31 body styles. Horsepower is up slightly in both sixes and eights.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1939	1940	1941
Jan.	356,962	449,492	524,058
Feb.	317,520	422,225	509,326
March	389,499	440,232	533,849
April	354,266	452,433	489,854
May	313,248	412,492	545,355
June	324,253	362,566	546,278
July	218,600	246,171	468,757
7 mos.	2,274,348	2,785,611	3,617,510
Aug.	103,343	89,866	.....
Sept.	192,679	284,583	.....
Oct.	324,689	514,374	.....
Nov.	368,541	510,973	.....
Dec.	469,118	506,931	.....
Year	3,732,718	4,692,338	.....

Estimated by Ward's Reports

Week ended:	1941	1940†
Aug. 23	45,525	23,732
Aug. 30	39,965	27,645
Sept. 6	32,940	39,665
Sept. 13	53,165	66,615
Sept. 20	60,560	78,820

†Comparable week

North American Aviation To Add Three Buildings

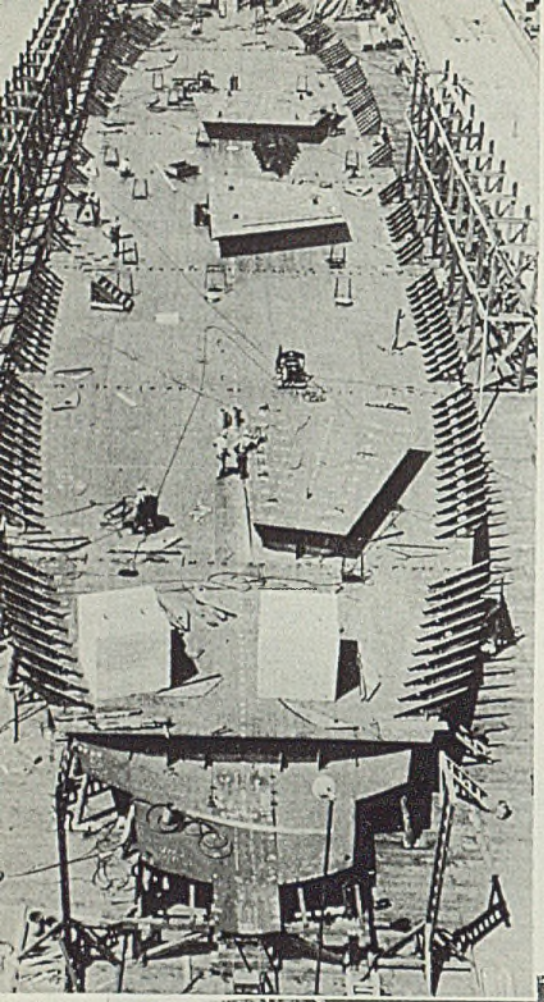
■ North American Aviation Inc., Inglewood, Calif., announces construction will begin within the next two weeks on three additions to the Inglewood plant to accommodate, among other things, an estimated 100 per cent increase in engineering personnel. The new units will be a new engineering building, an advanced production building, and an elaborate wind tunnel.

A total of 180,000 square feet will be added to the plant floor area, bringing the total to 1,234,000.

Koppers To Construct Coke Plant in Brazil

■ Koppers Co., Pittsburgh, last week reported it has been awarded a contract for a complete by-product coke plant for Companhia Siderurgica Nacional (Brazilian National Steel Co.) at Volta Redonda, near Rio de Janeiro. Award, according to Joseph Becker, Koppers vice president, totals approximately $3,000,000 and comprises 55 Becker type coke ovens and a plant for recovery of ammonia, tar, benzol, toluol and other by-products.

The unit is to be built in connection with a blast furnace and steel plant. Contract was negotiated with Lieut. Col. E. Macedo Soares e Silva, technical director of the Brazilian Steel company, and Arthur G. McKee & Co., Cleveland, engineers for the entire steel works.



Shipbuilding

Liberty Ships Completed in Five Months; Maritime Commission Nears "Two-a-Day" Goal

■ TWELVE new merchant vessels will slide down the ways at shipyards on the Atlantic, Pacific and Gulf coasts next Saturday, Sept. 27, in what Admiral Emory S. Land, chairman, Maritime Commission, terms the largest mass launching since World war days.

Three of the vessels will be the EC-2 type, emergency cargo carriers called Liberty ships. Keels for these have been laid in the past five months and their delivery is far ahead of original schedules. Only two Liberty ships were scheduled for completion this year, but present indications are that 20 will be delivered.

"With the acceleration that has been given the commission's long range and emergency programs, we are confident that our pledge to the American people of 'two ships a day in 1942 and 1943' will be fulfilled."

Three hundred and twelve of the emergency vessels are under construction and the commission has been authorized to build more. They cost from $1,500,000 to $1,700 000 as compared with $2,000,000 to $3,000,000 for the conventional vessels.

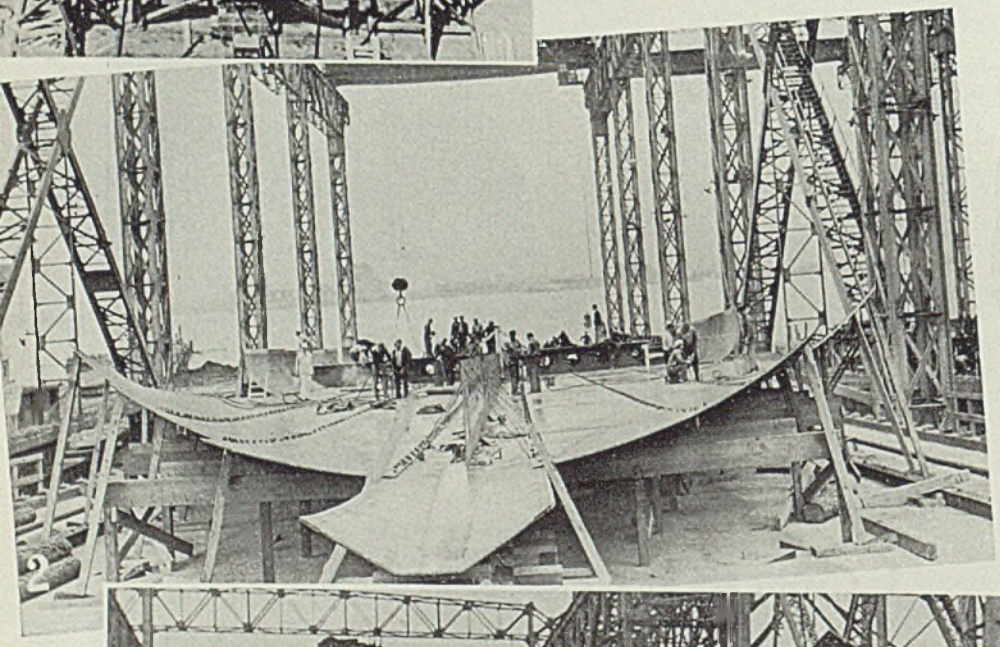


Fig. 1—Completed inner bottom of one of the Liberty ships, with frames beginning to rise at the sides, at the California Ship Building Co. yards, Los Angeles. On the floor are sections which arrive from the steel mills prefabricated

Fig. 2—This keel level view shows subassemblies in place, fanning out from the keel

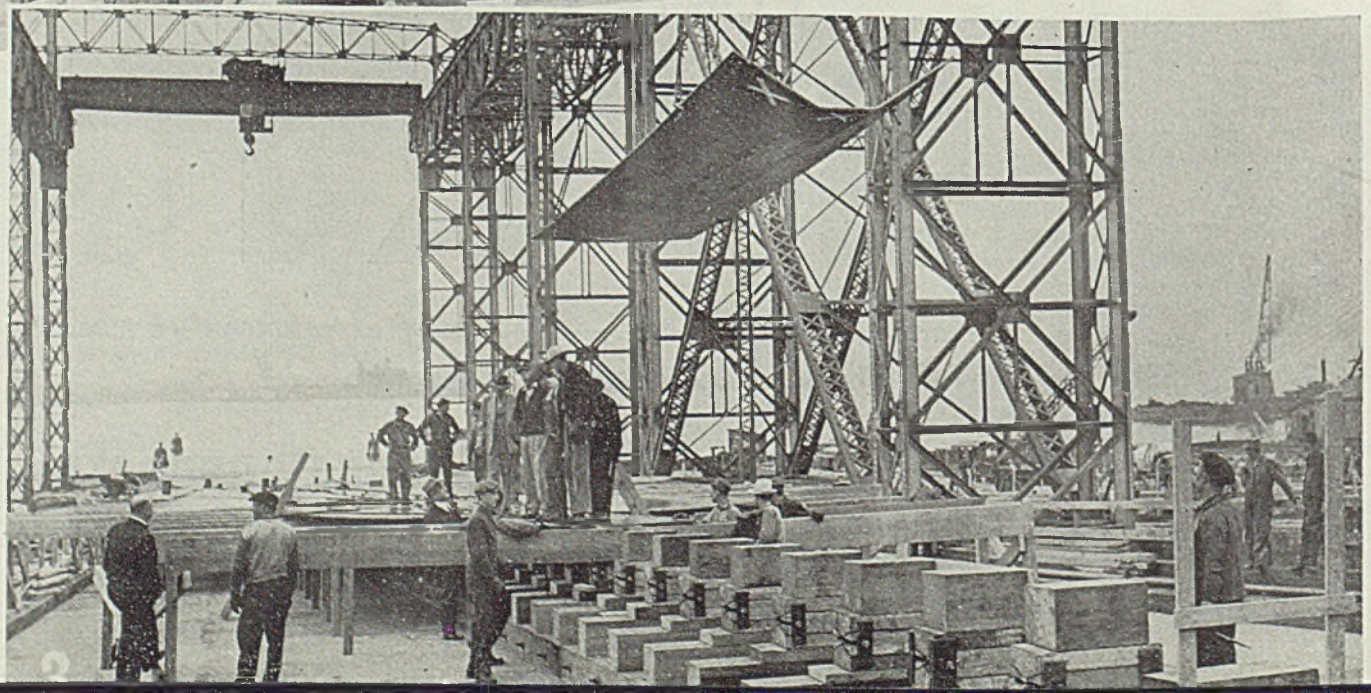


Fig. 3—First section of an EC-2 ship's keel is lowered onto the ways at the Bethlehem Steel Co.'s yards in Baltimore. Within four and a half to six months, the finished ship will ride down the ways. NEA photos

Defense Contract Opportunities . . . . .

■ HOW can the nondefense manufacturer whose raw materials supply has been shut off or curtailed by priority control stay in business? Best answer: Convert facilities to defense work, either as a subcontractor, or in some cases as a prime contractor.

Division of Contract Distribution, OPM, issues data on subcontract work through its regional offices, usually located in Federal Reserve Banks or the bank branches. Data on prime contracts also are issued by the regional offices, which usually have drawings and specifications; bids, however, should be sent directly to the contracting officers.

To aid manufacturers threatened with necessity for curtailing civilian production, STEEL herewith presents a list of opportunities for prime and subcontracting of defense work, for which priority ratings may be obtained. Other opportunities will be presented from week to week.

In especially heavy demand are firms having automatic screw machines or hand screw machines. Regional office directors have asked that such facilities be listed with the OPM offices immediately. Other facilities also should be listed and filed with the regional offices.

Aggressive following up of the opportunities listed with the Division of Contract Distribution will enable many plants, which would otherwise close, to continue operations.

Contract Distribution Division, OPM, Federal Reserve Bank Building, Cleveland, asks subcontractors for the following work:

22-908. Eastern Ohio manufacturer has machine work on forged steel rolls, 12" x 45"; will require engine lathe, milling machine and grinding equipment, with turning and milling operations. Material, 30-40 C forged steel, is furnished. Delivery requirements, Sept. 30.

31-908. Cleveland manufacturer wishes to subcontract machining of yokes for army trucks. Bullard Multimatic or multiple spindle chucking automatics or good screw machine (chucking), required. Operations on first rough turn only—drilling, boring, facing and reaming. Materials, furnished, are SAE 1335 forgings, with delivery of 100-400-500 daily, seven various yokes. Turning tolerances are .005 to plus or minus .010; reaming, plus or minus .002. Quantities are 5000, 10,000 or 20,000.

32-911. Southeastern manufacturer has machining of twin and quadruple gun mount castings. Requires 72", 96" and 120" vertical boring mills; 60", 72" and 96" planers; 3" and 5" horizontal boring mills; 5' and 6' radial drills. Operations are boring, drilling and planing. Material is commercial cast steel. Tolerances are .005 to .010; others to .002.

33-908. Navy branch requires machining of 8" gun slides, 16,000 pounds cast steel. Approximate dimensions are 53" x 54" x 103". Necessitates planer with at least 6' x 6' opening and 12" or 13" travel, or boring mill or lathe capable of handling an 8" boring bar, 26.125 plus .001 or minus .000 hole 103" long. Material is cast steel. Tolerances are: Planing, plus or minus .010 to .040; boring is plus .010 and minus .000. Blueprints available through Navy source. Sketch on file in Cleveland office.

34-911. Pennsylvania manufacturer has the following:

Complete fabrication of piston pins about 4" x 1.18".

Complete manufacture of pin links about 3" x 1". Equipment required: spindle automatic screw machines, 1½" x 4"; heat treating; magnetic inspection; nitriding; internal and external grinding; milling; drilling; and threading. Will furnish nitralloy G special steel. Requirements are 15,000 each of the piston pins and pin links, with tolerances of .0003 external diameter. Blueprints are on file at this office.

35-911. Eastern Pennsylvania manufacturer has swaging and polishing only of push rods ½" x 12". Requires bulldozers for swaging steel tube tapered from center to each end. Operations are swaging to size, polishing and magnetic inspection. Material is ½" outside diameter steel tubing, .046-.052 wall, SAE 4130, not furnished. Requirements are 15,000-20,000, with tolerances .010. Blueprints on file in district office.

36-912. Cleveland manufacturer requires machining of small parts for Pratt-Whitney and Wright Aeronautical engines. Requires Warner & Swasey turret lathes, or Gisholt, Potter & Johnson, or equivalents; automatic chucking machines; Goss & De Leuw or New Britain milling machines. Operations comprise boring, reaming, turning, milling. Bar stock and forging materials will be furnished. Tolerances are close and varying. Blueprints on file in district office.

Contract Distribution Division, OPM, 240 Rand Tower, Minneapolis, reports the following:

No. 116—Minneapolis company needs to sublet making of ten separate parts for machine guns. Parts drawings and complete shop routine setup information available.

Gear blanking, cutting and splining capacity available. This firm has government contracts that do not require use of this equipment and will help any other government contractors. Write: S. O. Hall, Minneapolis Moline Power Implement Co., Minneapolis.

No. 119—Minneapolis firm urgently needs to sublet considerable automatic screw machine work—1" capacity.

No. 132—4500 (possibly 10,000) cast steel tank periscope heads to be bored and machined on heavy duty 12" swing lathes. Castings to be furnished. Deliveries to start in October and continue to June, 1942 (longer if quantity is increased).

Minneapolis office, Contract Distribution Division, reports following prime contracts pending:

Sched. 8696—various special tools, wrenches and bits; Bureau of Supplies & Accounts, Navy Department, Washington; bids Sept. 30.

Sched. 8617—various chucks, adapters, sockets, drifts, and collets; Bureau of Supplies & Accounts, Navy Department, Washington; bids Sept. 26.

Sched. 8616—423 taps and dies; Bureau of Supplies & Accounts, Navy Department, Washington; bids Sept. 26.

Sched. 8622—kitchen hardware, including 8400 steel meat hooks, 8100 wire egg whips, 16", 2250 black steel bread pans, 1900 steel fry pans, 1400 bread boxes, and 1000 bakery scrapers; Bureau of Supplies & Accounts, Navy Department, Washington; bids Oct. 2.

698-42-150—furnishing all plant labor and materials and performing all work for fabricating and delivering steel trash racks, gates, stop logs, dogging devices and storage hooks for the powerhouse at Bonneville Dam, Portland, Oreg.; U. S. Engineer Office, 628 Pittock Block, Portland, Oreg.; bids Oct. 10.

257-42-12—furnishing plant, labor and materials, also work for designing, furnishing and delivering 2 turbines with accessories and 2 sets of governing equipment for the Denison Dam Power Plant, Denison, Tex.; U. S. Engineer Office, Denison, Tex.; bids Sept. 30.

Constructing Aircraft Laboratory and Test building, Wright Field, Dayton, O. (approx. overall dimensions of 266' x 51' with center wing 100' x 51'. Two floors and basement.); U. S. Eng. Office, P. O. Box 821, Wright Field, Dayton; bids Sept. 30.

Contract Distribution Division, OPM, Federal Reserve Bank Building, Pittsburgh, asks subcontractors for the following work:

AMS-1. Baltimore manufacturer wants to subcontract 30,000 small drop forged bushings. Pieces vary in size from 2⅛" inside diameter to 3" inside diameter with an outside diameter of 4" and an overall length of from 1⅛" to 3⅛". One smaller flange bushing, 1¾" inside by 2⅞" outside by 4" in length. All pieces are to be heat treated and finished with nitrided surfaces. Need is urgent on this requirement.

UMP-3. New York manufacturer wishes to subcontract 50,000 steel pins. Operations require milling, turret lathe and planer operations, as well as heat treating. Tolerances range from .01 to .002. Second group requires multiple spindle drills and 4 or 6 spindle automatic screw machines. These pieces to be heat treated.

GE-4. New York manufacturer wishes to subcontract large quantity of stainless steel worm gears. All surfaces machined with 65 finish. Material, stainless steel. Length 2⅝", outside diameter ½", plus or minus .001. Tolerances on shaft plus .0002, minus .0000.

SP-5. New York manufacturer requires following operations: Layout, milling, chilling, reaming, boring and tapping. Heat treated aluminum, silicon castings will be furnished by prime contractor. The following groups or equivalent are required: 4—No. 330 Giddings & Lewis boring bars; 18—Pratt & Whitney profilers; 6—Open side gray planers—milling type; 4—Radial drills and single and multiple spindle drills up to 1" capacity.

BT-7. Connecticut manufacturer wants automatic screw machines, 6 spindles. Quantities 100,000 to 500,000; material—steel; length 2½"; outside diameter—1".

PDS-8. Pittsburgh manufacturer requires milling, boring, turret and shaper work on 72 small triangular steel blocks. Tolerances plus or minus 1/64th. Dimensions of steel block 5¼" x 6" x 5".

WEM-9. Pittsburgh manufacturer has considerable and continuous work for horizontal boring mills with 5" or larger bar; vertical boring mills 84" and up; milling machines, planers and radial drills of 5' to 6'.

HKP-11. Pittsburgh manufacturer wishes to subcontract assembly work on 8" ogive. Quantity between 1000 and 7000 pieces. Operations call for turret lathe and resistance welding. Pieces approximately 8" at base, 2" at nose, 32" in length.

BAC-12. Aircraft company has large volume of work requiring milling machines, turret lathes and planers. Close tolerances.

BK-13. Requires following machine groups: 1. 72" vertical boring mill, 5' radial drill; 2. 72" vertical boring mill, 3" horizontal boring mill, 72" planer; 3. 60" planer, 5" horizontal boring mill, 5' radial drill; 4. 96" vertical boring mill, 6' radial drill; 5. 120" vertical boring mill, 96" planer, 6' radial drill. Commercial steel castings will be furnished by prime contractor. Rough machine tolerances .003 to .005. Finished machine tolerances .001 to .002.

BL-14. Pennsylvania manufacturer requires considerable time on horizontal and vertical boring mills with 5" bars and 72" or up on armored castings.

CA-15. Aircraft manufacturer requires assistance in the manufacture of landing gear controls and landing gear trunion.

Contract Distribution Division, OPM, Federal Reserve Bank Building, Cleveland, reports the following Navy contracts up for bids:

Sched. 8388. Fuze and nose dummy plugs, machine finish all over, tolerances plus or minus .010. Material, carbon steel. Drawing 73708 on file in divisional office. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 25.

Sched. 8626. Grinders, cylindrical, plain, self-contained, motor-driven, 10" x 36". Detail specifications shown on schedule. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 26.

Sched. 8628. Hydraulic motor-driven gear grinder machine. Detail specifications shown on schedule. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 25.

Sched. 8629. Turning, offset shank, lathe tool holders, with wrench and high speed cutter. Specifications in accordance with sketch No. 19814, through Bureau of Supplies and Accounts, Navy Department, Washington; bids Sept. 25.

Sched. 8634. Single conductor cable. Specifications J-C-101b on file in Cleveland office. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 25.

Sched. 8639. Self-contained 3" bevel gear generator. Detail specifications shown on schedule. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 25.

Sched. 8658. Rubber insulated and jacketed electric cable on reels. Specifications 15-C-1

(Int.) on file in Cleveland office. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 30.

Sched. 8682. Electrically operated dish-washing machines. Specifications 17-M-17 (Int.) on file in Cleveland office. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 30.

Sched. 8687. Steel boiler tubes. Specifications 44-T-3 (Int.) on file at Cleveland office. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 30.

Sched. 8654. Seamless Copper tubing. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 30.

Sched. 8678. Bar tin-lead solder. Bureau of Supplies and Accounts, Navy Department, Washington, bids Oct. 2.

Sched. 8681. Projectiles for .45 caliber line-throwing rifle. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 30.

Sched. 8696. Blades, stocks, screws, keys and other materials. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 30.

Sched. 8697. Multiple stage motor-driven air compressor. Bureau of Supplies and Accounts, Navy Department, Washington, bids Sept. 30.

Sched. 8698. Steel, bar, round, grade V, 12' lengths, grade B W black, bar, for re-forging round, nickel-chromium, 12' lengths, hexagon, square, 24" diameter. Bureau of Supplies and Accounts, Navy Department, Washington, bids Oct. 3.

Rolls-Royce Inc., 150 Broadway, New York, is seeking metalworking companies with facilities for the manufacture of the following items: Reamers, milling cutters, thread milling cutters and drills. Limits on these tools are to follow American standards and are to be made of high-speed steel or molybdenum steel. Quantities range from six to 1000 pieces. In addition the company is attempting to locate plants able to carry out any operation relative to the manufacture of these tools, especially facilities for flute milling and grinding.

Facilities also are sought for the manufacture of small precision parts, tolerances to be held within tenths; gears of all types, including spline shafts, also grinding of gears; studs and bolts, ground with precision threads, as well as various other small parts. Available capacity of single spindle Bullard and horizontal mills with capacity up to 38 inches also is wanted. Equipment for processing buttress threads and forging capacity are other requirements.

Pamphlet Illustrates Steel's Defense Role

■ Steel's role in preparing the nation against any who would destroy the American way of life is graphically portrayed in a pamphlet, Steel for Defense, recently published by the American Iron and Steel Institute, New York. Vital need for steel not only for combat equipment but also in manufacture of the essentials of civilian life is emphasized.

Declaring the American steel industry is the bulwark of national defense, the pamphlet reports enough steel can be produced to supply our own vital needs and whatever England needs from us. The industry's vast program of expansion and modernization, pursued at a cost of nearly $2,000,000,000 since 1929, is cited indicative of its progress.

To that program of improvement is ascribed the industry's ability to instantly make available in 1940 its vast productive facilities to the purposes of the bulk of the defense program when it was started.

Comprehensive descriptions of the part played by steel in defense of the air, at sea, on land, behind the lines, and in producing requirements of the future are also included.

Koppers Co. Lights One Granite City Furnace

■ Koppers United Co., Pittsburgh, last week reported one of its recently-purchased blast furnaces at Granite City, Ill., and long idle, was relighted after having been rehabilitated. Reconditioned to produce 700 gross tons of pig iron daily, its annual capacity will be 250,000 tons.

Half the output, it is reported, will be delivered molten to Granite City Steel Co. Remainder will be shipped to other firms, largely in the St. Louis area.

To insure uninterrupted operations, the ore yard has been stocked with 2500 carloads or about 150,000 tons from northern ore ranges. Shipments by early November are expected to total 300,000 tons. This will provide ore backlog sufficient for continuous operation until shipments can be resumed in the spring.

Daily raw material requirements will include: 1400 tons of ore; 600 tons coke; and 300 tons local limestone. Koppers is reported interested in development of Missouri ores as a nearby source of supply.

Steel House Easily Moved and Re-erected

■ Adaptability of the all-steel defense house to conditions requiring its removal from one defense project to another was demonstrated recently. One of the 58 structures furnished to the Public Buildings Administration of Federal Works Agency at its Indian Head, Md., project by Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., was dismantled in four hours and forty minutes, carried 32 miles by truck and re-erected under roof in three working hours. The operation required 104 man-hours.

The structure is of panel-built construction, as developed by engineers of the Tennessee company, and has been used extensively in projects of the Farm Security Board and the Navy. Cost of the building at Indian Head was $2780.

ACF Uses Aquacade Steel in Plant Addition

■ Structural steel salvaged from several featured buildings of the recent New York World's fair was employed in construction of a new 31,000-square foot addition to the armor plate plant of American Car & Foundry Co., Berwick, Pa. Originally part of the aquacade and futurama exhibits of the exposition, the salvaged steelwork now comprises part of a unit serving the nation's basic defense requirements.

Armor plate manufactured in the new addition to the company's Armor Plate Division will be used by American Car & Foundry in building tanks for the army.

Great Lakes Ore Fleet Continues at Capacity

■ The entire Great Lakes ore fleet of 292 vessels is operating at capacity for the fifth consecutive month, according to C. C. Lindeman, statistician for M. A. Hanna Co., Cleveland. It was just one year ago that the 1940 fleet of 296 vessels reached 100 per cent operations.

Aiding the American carriers are 17 Canadian boats, which are estimated to have loaded upwards of 400,000 tons so far this season.

Government Forms Are Available

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■ Forms PD-73, PD-25-C, PD-25-D which now must be attached to every order or contract for defense supplies are available to STEEL's readers, shipments being made 24 hours after orders are received.

These forms can be obtained from STEEL, Readers' Service Department, Penton Building, Cleveland, at the following prices:

Quantity of		Quantity of	
100	$1.00	1,000	$3.55
200	$1.50	2,500- 5,000	$3.25 per M
300	$2.00	5,000-10,000	$2.95 per M
400	$2.50	10,000-20,000	$2.75 per M
500	$3.00	20,000 and over	$2.55 per M

NOTE: Postage is not included in above prices. If your order originates in Ohio, please include sales tax.

War Department Awards $59,933,601 National Defense Contracts in Week

■ DEFENSE contracts reported last week by the War Department totaled $59,933,601, substantially below the levels of the preceding two weeks. Ordnance department awards again were most numerous, and nearly all were small.

Douglas Aircraft Co. Inc., Santa Monica, Calif., was reported to have accepted a $12,619,097 letter of intent from the War Department for construction and acquisition of emergency plant facilities. Facilities are to be utilized in fabricating substantial quantities of air frames for the B-17-E heavy bombardment planes. Douglas and Vega Airplane Co., Burbank, Calif., are to supplement Boeing Airplane Co., Seattle, in production of the new B-17-E Flying Fortress.

Contracts reported by the War Department in the week included:

American Friedman Bitulithic Association, Houston, Tex., supplemental contract totaling $1,932,838 for airplane hangars, 44 miscellaneous buildings, officers' mess, hospital buildings, enlarging gas and oil storage systems, utilities at the advanced pilot training school, Victoria, Tex.

Wolfe, H. E., Construction Co. Inc., St. Augustine, Fla., and L. B. McLeod Construction Co., Orlando, Fla., $828,535 negotiated contract for services and materials at Camp Blanding, Florida.

Ordnance Department Awards

Allegheny Ludlum Steel Corp., Brackenridge, Pa., gages, tool steel, $27,810.87.

American Brass Co., Detroit, brass, $3984.92.

American Car & Foundry Co., Berwick, Pa., bushings, parts and overhaul of tanks, $1360.

American Emery Wheel Works, Providence, R. I., aluminum oxide grain aloxite, $14,050.

American Locomotive Co., Latrobe, Pa., parts for tanks, forged steel rings, $4222.55.

American Manganese Bronze Co., Holmesburg, Philadelphia, manganese bronze, $6412.86.

American Screw Co., Providence, R. I., screws, $6886.42.

Andre, J. Harold, Davenport, Iowa, steel tubing, $1129.08.

Arguto Oilless Bearing Co., Philadelphia, punches, $2800.

Armstrong Blum Mfg. Co., Chicago, hacksaw blades, hacksaws, $6770.64.

Armwall Machine Co., Jeanette, Pa., gages, $1160.

Associated Spring Corp., Wallace Barnes Co. Division, Bristol, Conn., butt plate plunger springs, ejector clips, $15,702.89.

Atlantic Elevator Co., Philadelphia, traversing drive, $2000.

Atlantic Metal Hose Co. Inc., New York, tubes, $3870.80.

Axelson Mfg. Co., St. Louis, forgings, $754,900.

Barber-Colman Co., Rockford, Ill., milling cutters, reamers, $30,376.80.

Barker Tool Die & Gauge Co., Detroit, gages, $6552.

Bath, John, & Co. Inc., Worcester, Mass., taps, $3750.

Bauer Bros. Co., Springfield, O., shells, $1,930,500.

Bay Products Corp., Newton, Mass., carbon removing tools, $219,002.41.

Bay State Abrasive Products Co., Westboro, Mass., grinding wheels, $1111.88.

Bendix Aviation Corp., Bendix Products Division, South Bend, Ind., parts for carburetors, $56,052.01.

Berger Acoustical Co. Inc., Philadelphia, air conditioning system, $4370.

Bethlehem Steel Co., Bethlehem, Pa., steel, $102,750.

Bliss, E. W., Co., Brooklyn, N. Y., power presses, $1585.

Boeing Aircraft Co., Seattle, airplanes and spare parts, $337,447,058.

Brill, J. G., Co., Philadelphia, forgings, $15,022.

Bristol Brass Corp., Bristol, Conn., brass, $163,400.

Brown & Sharpe Mfg. Co., Providence, R. I., grinding machines, $736,870.

Brown Lipe Gear Co., General Drop Forge Division, Buffalo, drop forgings, $1855.

Buda Co., Harvey, Ill., exhaust ring assemblies, $29,280.

Candler-Hill Corp., Detroit, parts for tanks, $9848.05.

Carnegie-Illinois Steel Corp., Pittsburgh, steel, $20,023.37.

Carpenter Steel Co., Reading, Pa., tool steel, $6489.

Chase Brass & Copper Co. Inc., Waterbury, Conn., manganese bronze, brass and retainers, $8478.65.

Chelsea Clock Co., Chelsea, Mass., clocks and carrying cases, $8352.75.

Chris Craft Corp., Algonac, Mich., stock cabin boats and motor yacht, $166,250.

Cincinnati Bickford Tool Co., Cincinnati, drill presses, $4316.

Cincinnati Lathe & Tool Co., Cincinnati, lathes, $45,897.20.

Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, grinding machines, $7546.

Cleveland Cutter & Reamer Co., Cleveland, tools, $1700.

Cleveland Tractor Co., Cleveland, track assemblies, $1072.

Cleveland Twist Drill Co., Cleveland, drill and counterbore combinations, reamers, $2628.82.

Collis Co., Clinton, Iowa, parts for tanks, dies and studs, $7274.25.

Colonial Alloys Co., Philadelphia, duralumin for small arms experimental work in laboratory, $1198.44.

Columbus Forge & Iron Co., Columbus, O., forgings, $3458.80.

Conkey, H. D., & Co., Conco Engineering Works Division, Mendota, Ill., cranes, $23,290.

Consolidated Machine Tool Corp., Rochester, N. Y., lathes, $19,145.

Construction Machinery Co., Waterloo, Iowa, concrete mixer, $1090.

Continental Motors Corp., Detroit, parts for tanks, $4610.67.

Cowles, C., Co., New Haven, Conn., oilers, $39,547.25.

Crescent Electric Supply Co., Davenport, Iowa, transformers and capacitors, $2995.32.

Crucible Steel Co. of America; Syracuse, N. Y., Division, steel, $2987.29; Spaulding & Jennings Works, Jersey City, N. J., steel strip, $4415.90.

Cuno Engineering Corp., Meriden, Conn., gas filters, $1335.

Cutter Wood & Sanderson Co., Hartford, Conn., screws, nuts and bolts, $3319.43.

Derbyshire Machine & Tool Co., Philadelphia, heading dies, $11,850.

De Sanno, A. P., & Son Inc., Phoenixville, Pa., grinding wheels, $1101.06.

Detroit Seamless Steel Tubes Co., Detroit, boiler tubes, $1227.04.

Detroit Steel Tube Co., Detroit, steel tubing, $2398.47.

Douglas Aircraft Co. Inc., Santa Monica, Calif., airplanes and spare parts, $9,709,616.85.

Dreis & Krump Mfg. Co., Chicago, press brakes, $43,576.60.

Drive-All Mfg. Co., Detroit, drive units, $39,837.50.

Eclipse Aviation Division, Bendix, N. J., parts for starters and generators, parts for tanks, $15,926.80.

Edgcomb Steel Co., Philadelphia, forgings, $2475.

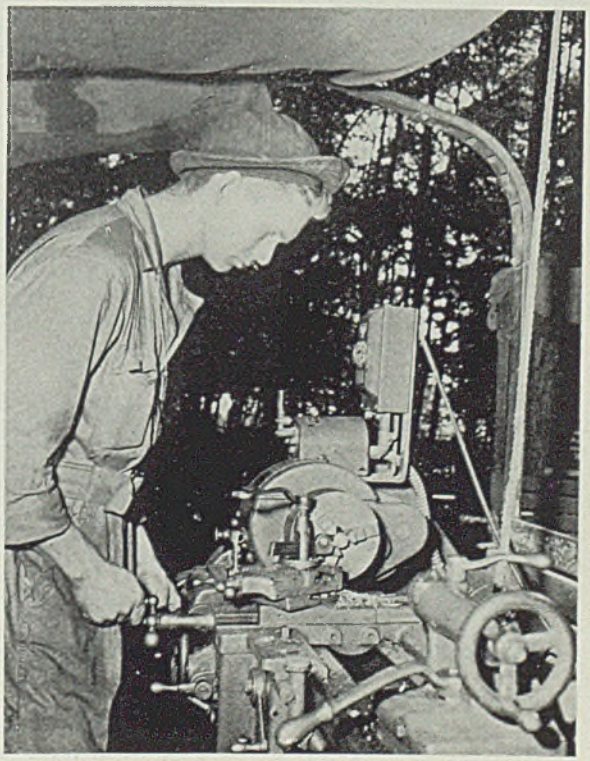
Edgewater Steel Co., Oakmont, Pa., forgings, $45,551.16.

Fargo Motor Corp., Detroit, ½-ton trucks, $2,809,561.20.

Farquhar, A. B., Co. Ltd., York, Pa.,

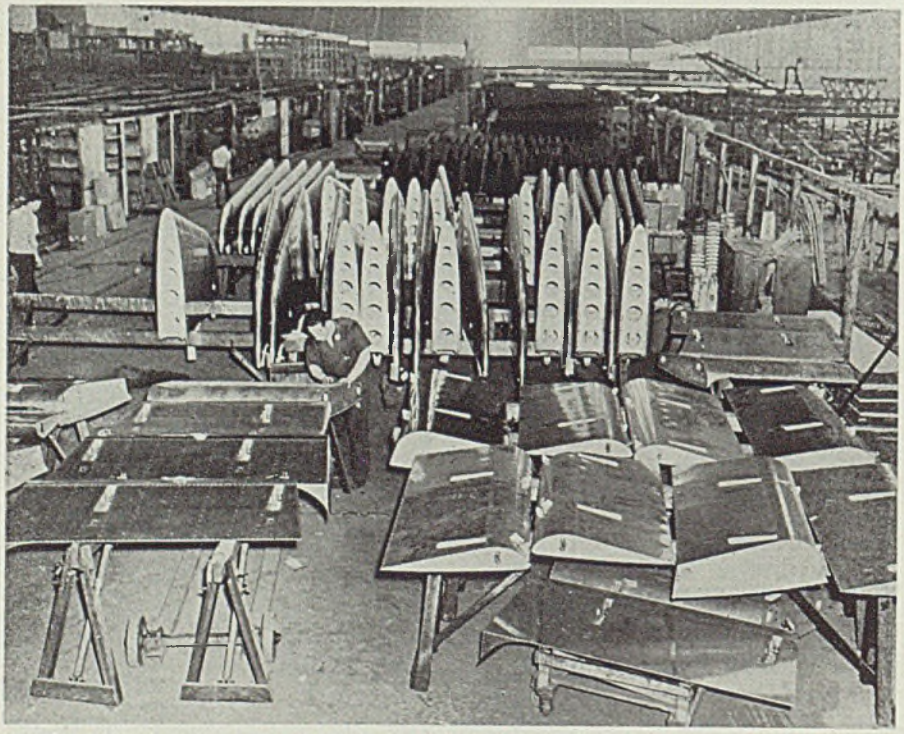
Repair Shop On Wheels

■ Repair shops on wheels, like this lathe mounted on a 2½-ton truck, accompany army units at all times and perform required maintenance and repair work. This machine is part of the maintenance shops of the 111th Quartermaster Corps, which does repair work for the entire 36th Division. Each repair unit, of which this lathe represents only a part, carries more than $30,000 in machinery and spares at all times. NEA photo



hydraulic straightening presses, $29,840.
Firth-Sterling Steel Co., McKeesport, Pa., bottom dies, tools, tool steel, $32,993.44.
Fischer, Charles, Spring Co., Booklyn, N. Y., springs, $70,817.94.
Fosdick Machine Tool Co., Cincinnati, radial drills, $20,750.
Frick-Gallagher Mfg. Co., Wellston, O., rotating type units, $1266.
Gas Weld Equipment Co., Boston, welding supplies and equipment, $1588.68.
General Motors Sales Corp., Hyatt Bearing Division, Chicago, bearings, $1137.50.
General Time Instruments Corp., Seth Thomas Clocks Division, Thomaston, Conn., fuze parts, $149,610; Westclox Division, La Salle, Ill., screws, $3000.
General Tool Sales Co., Philadelphia, tools, $3320.
Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., boring, drilling and milling machines, $92,024.
Goodman Mfg. Co., Chicago, carbon steel forgings and yokes, $100,453.
Goodyear Tire & Rubber Co., Akron, O., track assemblies, $3584.
Gorton, George, Machine Co., Racine, Wis., milling machines, $31,287.
Great Lakes Steel Corp., Ecorse, Detroit, steel, $20,842.69.
Greenfield Tap & Die Corp., Greenfield, Mass., gages, high speed steel, hand taps, $13,201.
Guiberson Diesel Engine Co., Chicago, engines, parts for tanks, $59,057.47.
Gulf Coast Machine & Supply Co., Beaumont, Tex., forgings, $21,497.
Hadley Special Tool Co. Inc., Boston, tools, $3921.38.
Hendey Machine Co., Torrington, Conn., metal shapers, lathes, $71,049.10.
Heppenstall Co., Pittsburgh, die blocks, $2982.
Hepworth, Albert, Philadelphia, milling machines and lathes, $6918.50.
Highway Trailer Co., Edgerton, Wis., 2-wheel semitrailers, $553,383.60.
Hunter Engineering Co., Riverside, Calif., machines, $21,960.
Hydraulic Controls Inc., Chicago, parts for tanks, $10,097.
Illinois Tool Works, Chicago, cutters, $5313.70.
Johnson-Claflin Corp., Marlboro, Mass., gages, $8482.40.
Keenan Supply Co., Philadelphia, oil supply and storage tank system for sulphurized cutting oil, $3038.24.
Kelly, John P., Philadelphia, castings, $1492.80.
Kent Aircraft & Machine Tool Co., Camden, N. J., gages, $9000.
Kilgore Mfg. Co., International Flare-Signal Division, Tipp City, O., pyrotechnic pistols, $600,472.19.
Knight, W. B., Machinery Co., St. Louis, milling machines, $14,805.
Krueger, H. R., Co., Detroit, fixtures, $1560.
Landis, A. B., Sons Inc., Philadelphia, bumpers, $1562.
Larson, Charles E., & Sons Inc., Chicago, steel rings, $4731.
LeBlond, R. K., Machine Tool Co., Cincinnati, live tailstock, built-in centers, $1330.
Leitelt Bros., Chicago, phosphor bronze castings, $9539.25.
Lincoln Park Tool & Gage Co., Lincoln Park, Mich., gages, $1762.15.
Lindberg Engineering Co., Chicago, furnaces, $8270.
Logan Co. Inc., Louisville, Ky., ball bearings, $1482.
Mattatuck Mfg. Co., Waterbury, Conn., retaining springs, screw eyes, $36,600.

Rubber Company Fabricates Metal for Bombers



■ Row upon row of aluminum alloy covered control surfaces for Martin B-26 bombers undergo inspection in Goodyear Aircraft Corp's large factory at Akron, O. Goodyear is manufacturing airplane subassemblies for Martin, Consolidated, Curtiss-Wright and Grumman. Practically the entire floor space of the company's huge airship dock is being devoted to this work, and two new buildings, one of 400,000 square feet and one of 85,000 square feet are being rushed to provide for expansion of these activities

McCord Radiator & Mfg. Co., Detroit, helmets, electric machines, $796,622.89.
McKenna Metals Co., Latrobe, Pa., tools, $1515.
McQuay-Norris Mfg. Co., St. Louis, piston pins and piston rings, $6797.
Midvale Co., Nicetown, Philadelphia, forged steel rings, tubes, $869,880.
Midwest Tool & Mfg. Co., Detroit, milling cutters, $1176.60.
Minneapolis Moline Power Implement Co., Minneapolis, shells, $2,335,755.
Modern-Bond Corp., Wilmington, Del., repair parts, feed screws, extensions and feed changes, $1056.
Modern Tool & Die Co., Philadelphia, gages, $3060.
Mohawk Machine & Tool Co., New York, gages, $8320.
Morris Wheeler Co., Philadelphia, structural steel, $2105.36.
Morse Tool Co. Inc., Detroit, tools, $340,620.15.
Mt. Vernon Die Casting Corp., Mt. Vernon, N. Y., ogives, $21,543.
Mullins Mfg. Co., Salem, O., shells, $697,493.40.
Murdock Tool Co. Inc., Detroit, counterbore cutters, $2336.
National Automatic Machine Co., Richmond, Ind., tapping machines, $11,150.
National Enameling & Stamping Co., Granite City, Ill., water containers, $6265.20.
National Foundry & Machine Co., St. Louis, phosphor bronze castings, $5118.31.
National Wire & Cable Co., Pittsburgh, wire, $1277.08.
New York Thread Grinding Corp., New York, gages, $2236.
Nicholson File Co., Providence, R. I., parts for guns, $5656.12.
Niles-Bement-Pond Co., Pratt & Whitney Division, West Hartford, Conn., gear hobbing machines, grinders, hand taps, gages, drills, $21,433.61.
Norco Metal Products Co., Philadelphia, ejecting stems, $3960.
Norma-Hoffman Bearing Corp., Stamford, Conn., bearings, $1708.19.
Norton Co., Worcester, Mass., cutters and tool grinders, grinding wheels, $3617.10.
Ohio Seamless Tube Co., Shelby, O., seamless steel tubing, $1196.39.
Ohio Steel Foundry Co., Lima, O., steel, $698,625.
Oliver Farm Equipment Co., Springfield, O., firing pin bases, $1240.40.
Otis Steel Co., Cleveland, steel, $2091.74.
Pangborn Corp., Hagerstown, Md., angular steel grit, $2190.
Parish Pressed Steel Co., Reading, Pa., bundle packing accessories, $409,912.10.
Penn Tool Co., Philadelphia, screwdrivers, $3658.34.
Phosphor Bronze Smelting Co., Philadelphia, phosphor bronze, $2580.06.
Poor & Co., Canton Forge & Axle Works, Canton, O., forgings, $60,317.70.
Porter-McLeod Machine Tool Co. Inc., Hatfield, Mass., lathes, $3306.
Portland Forge & Foundry Co., Portland, Ind., forgings, $127,000.
Presto Gas Mfg. Co., Chicago, tire pumps, $1657.65.
Pringle Electrical Mfg. Co., Philadelphia, power switchboards and panels, $7236.
Production Tool & Die Co. Inc., Springfield, Mass., barrel straightening jacks, gages, $3696.
Putnam Tool Co., Detroit, end mills, $1340.
Quality Hardware & Machine Corp., Chicago, motor drives, $3275.94.
Rahaim Machine & Tool Co., Gardner, Mass., gages, $1766.50.
Rathbone, A. B. & J., Palmer, Mass., steel, $6741.
Reasoner Tool & Supply Co., Detroit, saws and blades, $6892.88.
Reed Mfg. Co., Erie, Pa., strap wrenches, $11,982.51.
Republic Steel Corp., Cleveland, steel bars, $1575.93.
Revere Copper & Brass Inc., Chicago, brass and bronze, $2367.93.
Rheem Mfg. Co., New Orleans, shells,

$1,034,250.
Rotary Electric Steel Co., Detroit, steel, $4418.10.
Ryerson, Joseph T., & Son Inc., Chicago, steel, $3402.26.
Safe Guard Corp., Lansdale, Pa., wrenches, $1558.
S. A. E. Steels Inc., Cleveland, steel, $1024.
Schollhorn, William, Co., New Haven, Conn., pliers, $61,819.80.
Schuylkill Forge Co., Philadelphia, forgings and machine steel rings for dies, $1852.05.
Scovill Mfg. Co. Inc., A. Schrader's Son Division, Brooklyn, N. Y., gages, $1606.25; Waterbury, Conn., Division, brass cartridge case cups, $340,000.
Sheffield Steel Corp., Kansas City, Mo., forgings, $600,000.
Sipp-Eastwood Corp., Paterson, N. J., drilling machines, $2298.
Smalley-General Co., Bay City, Mich., hobs for machine working tools, $2072.40.
Springfield Bronze & Aluminum Co., Springfield, Mass., parts for guns, $1766.85.
Standard Gage Co. Inc., Poughkeepsie, N. Y., gages, $2302.10.
Standard Steel Spring Co., Blood Bros. Machine Co. Division, Allegan, Mich., parts for tanks, $9833.20.
Stanley Works, Stanley Tools Division, New Britain, Conn., pin and center punches, hammers, $25,706.74.
St. Louis Steel Products Co., St. Louis, arming wire assemblies, $36,864.
Thibodaux Boiler Works, Thibodaux, La., shells, $900,000.
Threadwell Tap & Die Co., Greenfield, Mass., hand taps, $1960.30.
Thurston Mfg. Co., Providence, R. I., cutting tools, $1045.20.
Timken-Detroit Axle Co., Wisconsin Axle Division, Oshkosh, Wis., forks, collars, hubs, and differential packings, parts for tanks, $3618.80.
Tomkins-Johnson Co., Jackson, Mich., cutters, $1000.
Torq Electric Mfg. Co., Cleveland, modernizing of motor drive attachments, $4928.
Union Twist Drill Co., Chicago, drills and countersinks, tools, $11,541.44.
United Carr Fastener Corp., Cambridge, Mass., fasteners, $5220.
United States Machine Tool Co., Cincinnati, milling machines, $1880.
U. S. Pipe & Foundry Co., Birmingham, Ala., shells, $694,572.
U. S. Tool & Mfg. Co., Dearborn, Mich., milling cutters, $1572.
Van Norman Machine Tool Co., Springfield, Mass., parts for milling machine, $1379.25.
Veit & Young, Philadelphia, dies, stems, and detectors, $41,865.
Vimalert Co. Ltd., Jersey City, N. J., parts for engines, $461,219.79.
Vinco Corp., Detroit, gages, $17,056.
Wagner Malleable Iron Co., Decatur, Ill., castings, $2064.55.
Wallace Supplies Mfg. Co., Chicago, assemblies, $5260.
Waltham Watch Co., Waltham, Mass., fuze parts and escapement springs, $63,715.
Warner Electric Brake Mfg. Co., Beloit, Wis., parts for guns and wire, $1570.31.
Watson-Stillman Co., Roselle, N. J., covering and barricades for presses, $7413.
Wellman, S. K., Co., Cleveland, rivets, clutch facings, $62,283.83.
West Haven Foundry Co., West Haven, Conn., hammers, $16,550.27.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., bus distribution system and air circuit breakers, $12,415.
Wheeling Corrugating Co., Wheeling, W. Va., end plates, $30,006.75.
Williams, J. H., & Co., New York, wing nuts, $3121.55.
Wright Aeronautical Corp., Paterson, N. J., parts for tanks, parts for tool rolls, $7909.42.
Yellow Truck & Coach Mfg. Co., Pontiac, Mich., 2½-ton trucks, $4,016,562.78.
Young, E. H., & Son, Dayton, N. J., gages, $1208.30.
Youngstown Sheet & Tube Co., Indiana Harbor, Ind., steel, $4935.20; Struthers, O., Division, nails, $5538.
Zimmerman Steel Co., Bettendorf, Iowa, steel castings, steel, $29,364.60.

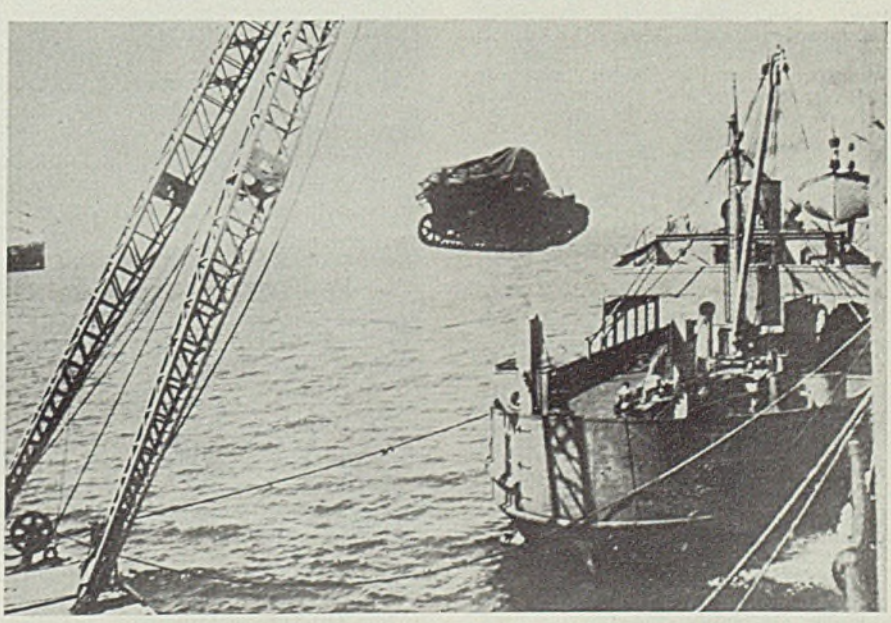
Quartermaster Corps Awards

Aluminum Cooking Utensil Co., New Kensington, Pa., cooking utensils, $100,515.81.
Aluminum Goods Mfg. Co., Manitowoc, Wis., canteens, $54,600.
American Brake Shoe & Foundry Co., American Forge Division, Chicago, shot, body and cap forgings, $59,555.25.
American Brass Co., Waterbury, Conn., manganese bronze, $4603.43.
American Car & Foundry Co., New York, engine assembly supports, bogie wheels, $9316.50.
Apex Tool & Cutter Co. Inc., Shelton, Conn., tapered blades, $4417.
Bendix Aviation Corp., New York, steering stabilizers and brackets, $4200.
Brewer Heating & Fuel Co., Winston-Salem, N. C., plumbing and heating systems in motor shops and sheds, Ft. Bragg, North Carolina, $41,000.
Chrysler Corp., Detroit, spare parts for trucks, $622,388.40.
Cover Stamping & Mfg. Co., Cambridge, Mass., tin cake pans, $1657.50.
Delta Electric Co., Marion, Ind., electric lanterns, $6750.
Diamond T Motor Co., Chicago, major assemblies, $73,224.16.
Ernst, E. C., Inc., Washington, electrical system, King warehouse, Alexandria, Va., $29,000.
Foley, Howard P., Philadelphia, extension to electric distribution and street light system, New Cumberland, Pa., $5480.
Ford Motor Co., Detroit, ¼-ton trucks, $29,620.14.
General Motors Corp., Chevrolet Division, Detroit, trucks, $31,732.87.
Hadley Special Tool Co., Boston, gages, $129,490.36.
Heil Co., Milwaukee, truck bodies, $11,437.
Lockwood Mfg. Co., Cincinnati, sheet bake pans, $7140.
Mack Mfg. Corp., Plainfield, N. J., spare parts and service tools for wreckers, $57,447.90.
Mitchell, Lloyd E., Inc., Baltimore, additional shower heads, Barracks, Ft. George G. Meade, Maryland, $7932.
Osborne, C. S., & Co., Harrison, N. J., component parts for tool-sets, $2967.60.
Petley Co. Inc., Newport News, Va., plumbing facilities, utilities, Ft. Eustis, Virginia, $11,250.
Simmons Co., New York, steel folding cots, $361,900.
Skilken Bros., Columbus, O., storage warehouse, Erie Proving Grounds, Ohio, $1,642,621.
Standard Engineering Co. Inc., Washington, heating system, King warehouse, Alexandria, Va., $28,355.
Star Sprinkler Corp., Philadelphia, automatic sprinkler system, Camp Haan, California, $14,796.
Tronick-McKenzie Co., Stanley, Wis., trunk lockers, $45,000.
White Motor Co., Cleveland, spare parts for trucks, $26,259.11.
Yellow Truck and Coach Mfg. Co., General Motors Truck & Coach Division, Pontiac, Mich., spare parts for trucks, $93,047.71.

Corps of Engineers Awards

Albert Pipe Supply Co. Inc., Brooklyn, N. Y., galvanized wrought iron pipe, $7320.
American Chain Link Machine Co., Los Angeles, fencing materials, Hill field, Ogden, Utah, $9234.
Aqua Systems Inc., New York, air corps gasoline fueling system, basic training school, Sherman-Denison airfield, Grayson county, Texas, $108,977.
Baltinger Electric Co. Inc., New York, parkway cable and tap boxes, aircraft assembly plant, Ft. Crook, Nebr., $7039.81.
Barber-Greene Co., Aurora, Ill., under car unloaders and flight conveyors, Windsor Locks airfield, Hartford, Conn., $3195.
Black & Decker Mfg. Co., Towson, Md., aircraft scales, aircraft assembly plant, Ft. Crook, Nebr., $3200.
Blickman, S., Inc., Weehawken, N. J., coffee urn batteries, Scott field, Illi-

United States Tanks Arrive in Egypt



■ American-built tanks arrive safely in the Middle East. This photo, received by clipper, shows a lease-lend fortress being unloaded from a vessel in Egypt. NEA photo, passed by British censor

nois, and Jefferson barracks, Missouri, $10,237.

Capitol Steel & Iron Co., Oklahoma City, Okla., hangar door assemblies, aviation mechanics' school, Wichita Falls, Tex., 398,000.

Chicago Pneumatic Tool Co., New York, compression riveters, electric drills, drill jigs, riveting hammers, screw drivers, other equipment, $319,676.

Clark Equipment Co., Clark Tructractor Division, Battle Creek, Mich., tractors, $2785.64.

Continental Machines Inc., Minneapolis, contour saw and filing machines and accessories, aircraft assembly plant, Tulsa, Okla., $3954.

Diamond, Arnold M., Brooklyn, N. Y., fire control towers, Bolivar Peninsula and Galveston Island, Texas, $48,380.

Fuchs Machinery & Supply Co., Omaha, Nebr., high speed riveting hammers, surface plates, drill presses, grinders and sanders, aircraft assembly plant, Ft. Crook, Nebr., $18,147.75.

Gates Hardware Co. Inc., Tulsa, Okla., screw drivers, rotary air drills, aircraft assembly plant, Tulsa, Okla., $6750.

Hayes, Charles E., Co., Springfield, Mass., electrical equipment, Westover field, Chicopee Falls, Mass., $2586.56.

Independent Electric Machinery Co., Kansas City, Mo., portable motor-generator sets, aircraft assembly plant, Kansas City, Kans., $2187.

Machinery Sales & Supply Co., Dallas, Tex., single surface planer, aircraft assembly plant, Tulsa, Okla., $3000.

Marshall Supply & Equipment Co., Tulsa, Okla., drill presses, lathes, scrugun, jig boring machine, drilling machines and accessories, aircraft assembly plant, Tulsa, Okla., $53,629.25.

McArdle Equipment Co., Houston, Tex., engine lathes and accessories, aircraft assembly plant, Tulsa, Okla., $11,071.

Mosher Steel Co., Dallas, Tex., structural steel for air corps hangars, aviation mechanics' school, Wichita Falls, Tex., $313,655.

Parker Appliance Co., Cleveland, hydraulic and automatic tube bender and accessories, aircraft assembly plant, Tulsa, Okla., $7211.97.

Twaits, Ford J., Co., Los Angeles, engine test building, McClellan field, Sacramento, Calif., $829,244.

United States Pipe & Foundry Co., Boston, cast iron pipe and fittings, Westover field, Chicopee Falls, Mass., $2472.74.

Utility Electric Co., St. Louis, electric toasters, Scott field, Illinois, $2453.10.

Van, John, Range Co., Cincinnati, kitchen equipment, Scott field, Illinois, $2205.

Wescott, Frank T., North Attleboro, Mass., Meadow Hill pumping station, East Hartford, Conn., $128,721.

Air Corps Awards

Air Associates Inc., Bendix, N. J., aircraft mooring kits, $145,125.

Aircraft Accessories Corp., Kansas City, Kans., propeller governor testing equipment, $126,910.

American Gas Accumulator Co., Elizabeth, N. J., field lighting trucks, $346,330.

American Seating Co., Grand Rapids, Mich., metal chairs, $84,600.

Bendix Aviation Corp., Bendix Products Division, South Bend, Ind., carburetors and spare parts, $551,521.

Bunell Machine & Tool Co., Cleveland, propeller and crank shaft parts, $104,154.

Cambridge Instrument Co. Inc., New York, fuel mixture indicator assemblies, $359,879.25.

Fairchild Aviation Corp., Jamaica, N. Y., finder assemblies, $54,810.

Fay, J. A., & Egan Co., Cincinnati, woodworking machinery, $64,250.

General Bronze Corp., Long Island City, N. Y., dolly assemblies, propellers, $269,100.

General Electric Co., Dayton, O., position indicator assemblies, $105,600.

General Motors Corp., Packard Electric Division, Warren, O., aircraft power and lighting cable, $58,006.25; Allison Division, Indianapolis, engines and spare parts, $8,621,570.

Gosiger, C. H., Machinery Co., Dayton, O., woodworking machinery, drill presses, bench type lathes, $451,154.75.

Kinsey, E. A., Co., Cincinnati, drill presses, $87,634.

Leece-Neville Co., Cleveland, maintenance parts for Leece-Neville type equipment, $313,091.30.

Longines Wittnauer Watch Co., New York, clock assemblies, $131,681.55.

Master Electric Co., Dayton, O., electric generating plants, $111,740.

Sheldon, R. D., Co., Cincinnati, woodworking machinery, $24,650.

Square D Co., Kollsman Instrument Division, Elmhurst, N. Y., remote indicating magnetic compasses, $330,000.

U. S. Electrical Motors Inc., Brooklyn, N. Y., test stands, $42,425.

Coast Artillery Corps Awards

American Auto Electric Sales Co., Chicago, switchboard type lever keys, switches, $3073.50.

Leschen, A., & Sons Rope Co., St. Louis, galvanized clips, $693.75.

Merrill Bros., Maspeth, N. Y., shackles, $7394.39.

Nutting Truck & Caster Co., Faribault, Minn., steel frame dollies, $3991.20.

O'Leary, Arthur J., & Son, Chicago, rings, $2048.76.

Taylor, S. G., Chain Co., Hammond, Ind., rings, $440.84.

Medical Corps Awards

Becton, Dickinson & Co., East Rutherford, N. J., surgical instruments, $9431.12.

Central Dental Mfg. Co., Louisville, Ky., foot engines, $25,382.50.

Langbein, William, & Bros., Brooklyn, N. Y., knives, $12,555.

Schneider, Theodore E., South Norwalk, Conn., scissors, $35,170.

Tiemann, George, & Co., Brooklyn, N. Y., scissors, $750.

Bell Co. Replaces Metals Essential to Defense

■ Materials substitution program started two years ago by the Bell System will make possible diversion for use in defense work in 1941 nearly 1,700,000 pounds of aluminum, more than 300,000 pounds of nickel, 8300 pounds of magnesium and more than 3,000,000 pounds of zinc. Additional reductions in the amount of these metals used in 1942 are foreseen by the company.

Total savings of aluminum effected by Western Electric Co., New York, manufacturing subsidiary of the system, is enough to build more than 275 military planes, it is reported. Replacement of the aluminum "finger wheel" on dial telephones with steel is said alone to result in saving 65 tons of aluminum annually.

Supplementing the Bell System's substitution and conservation program are the reclamation activities carried on by another subsidiary, Nassau Smelting & Refining Co. This concern supplied the system with more than 42,000,000 pounds of metal last year.

Reclaimed metals included 12,000,000 pounds of copper wire bar; more than 18,000,000 pounds of lead alloy for cable sheathing; 2,000,000 pounds lead sleeving for cable splices; 5,000 000 pounds of bronze wire bar; 500 000 pounds of brass billets; 3,000,000 pounds of solder in various forms; and more than 373,000 pounds of redistilled slab zinc.

Phelps Dodge To Lease, Operate New Tube Mill

■ Capacity production at the new seamless brass and copper tube and rod mills in the Los Angeles area to be operated by Phelps Dodge Copper Products Corp., subsidiary of Phelps Dodge Corp., New York, is expected before July, 1942, according to Wylie Brown, president.

The new facilities will be largely devoted to production of cupronickel, aluminum brass and admiralty condenser tubes, as well as copper and other alloy tubes required by the Navy and Maritime Commission.

Plant will provide 175,000 square feet of manufacturing space. Construction is financed by Defense Plant Corp., and upon completion this plant will be leased to Phelps Dodge for operation.

Enamelers Seek Offset To Materials Shortages

■ Porcelain enameling industry, faced with large-scale curtailment in operations due to materials shortages occasioned by defense program requirements, has started a campaign to protect itself during the present emergency. To co-ordinate the industry's efforts in this respect, a War Operations Committee recently was appointed.

Committee already has met and announced plans for a survey of the industry to ascertain equipment and employes involved. Study of porcelain enameled products that might carry priorities also has been started.

Numerous suggestions have been offered, both to keep the industry occupied in the current emergency and as a means of cushioning the return to eventual peacetime production. Substitution of defense items to fill empty capacity is being studied.

Members of the War Operations Committee include R. B. Calton, Tennessee Enamel Mfg. Co., Nashville, Tenn.; W. H. Brett, Enamel Products Co., Cleveland; Bennett Chapple Jr., Carnegie-Illinois Steel Corp., Pittsburgh; and R. H. Turk, Porcelain Enamel & Mfg. Co., Baltimore.

Canada Places Copper Deliveries on Quota Basis; Civilian Needs Curtailed

TORONTO, ONT.

■ PLAN for curtailment of nonessential copper consumption has been placed in effect in Canada to speed diversion of domestic supplies into war channels, it was reported last week by C. D. Howe, minister of munitions and supplies.

Announcement followed a meeting of G. C. Bateman, metals controller, with representatives of Canada's only primary fabricator of copper and brass, Anaconda American Brass Co. Ltd., New Toronto, Ont., and the two primary fabricators of copper rod and wire, Canada Wire & Cable Co. Ltd., Toronto, and Phillips Electric Works Ltd., Brockville, Ont.

The three companies have been placed on a quota basis in regard to delivery, and will be required to allocate their quotas to assure preference for essential war purposes. Institution of copper curtailment places this metal in the same category as aluminum, nickel and zinc as far as restriction for nonessential purposes is concerned.

Department of Munitions and Supply reported placing 3149 new contracts in the week ended Sept. 2. Combined value for the period was $29,533,627, and orders to companies in United States totaled $225,511.

Manitoba Bridge & Iron Works Ltd., Winnipeg, Man., received a $5,000,000 award for manufacture of 9000 units of naval equipment; Chrysler Corp. of Canada Ltd., Windsor, Ont., shells, $4,850,000; Western Clock Co., Peterborough, Ont., fuses, $1,850,000; and Beatty Bros. Ltd., Fergus, Ont., units of equipment, $10,000,000. Other contracts:

Munitions: Overseas Requisition, London, England, $17,078; A. Deslauriers & Fils Ltd., Quebec, Que., $11,379; Millen & Frere, Montreal, Que., $7236; Anaconda American Brass Ltd., New Toronto, Ont., $16,123; Viceroy Mfg. Co. of Canada Ltd., Toronto, $23,874; N. Slater Co. Ltd., Hamilton, Ont., $16,111.

Ordnance: Overseas Requisition, London, England, $15,807; Research Enterprises Ltd., Leaside, Ont., $34,992; Firestone Tire & Rubber Co. of Canada Ltd., Hamilton, $31,104.

Metals: Consolidated Mining & Smelting Co. of Canada Ltd., Montreal, $334,416.

Instruments: International Business Machines Ltd., Toronto, $16,589.

Land transport: General Motors Products of Canada Ltd., Oshawa, Ont., $12,586; Massey-Harris Co. Ltd., Toronto, $8670; Metallic Roofing Co. of Canada Ltd., Toronto, $178,200; Cockshutt Plow Co. Ltd., Brantford, Ont., $19,366; Ford Motor Co. of Canada Ltd., Windsor, Ont., $235,859; Gar Wood Industries Ltd., Windsor, $8632.

Aircraft: Overseas Requisition, London, England, $44,800; Stewart Warner Ltd., Belleville, Ont., $5521; Fleet Aircraft Ltd., Ft. Erie, Ont., $7863; Mattison-Hart Ltd., Etobicoke, Ont., $9062; Metallic Roofing Co. of Canada Ltd., Toronto, $6804; Toronto Iron Works Ltd., Toronto, $8925.

Electrical equipment: Canadian Telephone & Supplies Ltd., Halifax, N. S., $8250; Canadian Marconi Co. Ltd., Montreal, $102,557; Canadian Pacific Railway Co. Ltd., Montreal, $6160; Canadian General Electric Co. Ltd., Ottawa, $35,100; Northern Electric Co. Ltd., Ottawa, $16,508; Exide Batteries of Canada Ltd., Toronto, $12,080; Service Lamp Co. Ltd., London, Ont., $15,345.

Machinery: Holden Co. Ltd., Montreal, $5957; T. E. Ryder Machinery Co. Ltd., Montreal, $8010.

Tools: Canadian General Electric Co. Ltd., Ottawa, $23,868.

War construction projects: Acadia Construction Co. Ltd., Halifax, N. S., $550,000; A. Janin & Co., Montreal, $412,000; L. J. Ogilvie Co., Montreal, $394,619; Bird Construction Co. Ltd., Winnipeg, Man., $470,000; Buchan Construction Co., Calgary, Alta., $189,000; Ontario Construction Co., St. Catharines, Ont., $500,000.

Miscellaneous: Metal Stampings of Canada Ltd., Toronto, $8750; E. S. Sherwood, Ottawa, $37,942; C.-O.-Two Fire Equipment of Canada Ltd., Toronto, $5078; Canadian Ornamental Iron Works Ltd., Toronto, $14,943; Clare Bros Ltd., Winnipeg, Man., $53,062; Page Equipment & Construction Co. Ltd., Three Rivers, Que., $39,550; Steel Co. of Canada Ltd., Montreal, $5609; Horton Steel Works Ltd., Toronto, $10,750; Toronto Iron Works Ltd., Toronto, $20,002; Overseas Requisition, London, England, $54,059; Wilson Boxes Ltd., St. John, N. B., $5578; United Carr-Fastener Co. of Canada Ltd., Hamilton, Ont., $8017; Beatty Bros. Ltd., Fergus, Ont., $50,371; Whitehead Metal Products Ltd., Toronto, $38,988; Federal Typewriter Co. Ltd., Ottawa, $12,946; Ottawa Typewriter Co. Ltd., Ottawa, $12,946; Underwood, Elliott, Fisher Ltd., Ottawa, $13,070; H. B. Mitchell, Wolfville, N. S., $24,000; Cotter Bros. Ltd., Winnipeg, Man., $7000.

Rough-Shaped 500-Pound Canadian Aerial Bombs

■ Rough-shaped bombs in a Canadian munitions factory at Quebec, Que., being placed into position for processing. More than 100,000 aerial bombs of the 500-pound size will be produced in this one plant in 1941. Strictest of all inspectors on the staff at this plant is a Polish engineer. Bombed out of his native Poland and then France, he makes certain that every bomb turned out of this factory is perfect, so carries on his battle against Hitler. NEA photo passed by censor

Steel Bridge Design Competition Announced

■ Bridge design competition, sponsored annually by the American Institute of Steel Construction, and open to registered students of structural engineering and architecture in recognized technical schools of the United States and its possessions, was announced last week. Three cash prizes of $200, $100 and $50, respectively, are offered for the designs placed first, second and third.

Subject of the competitive design is a steel bridge to carry a highway over a river. Execution of the design must be entirely the work of one competitor. No other person may work on the design except to criticize and give advice.

Jury of nationally known engineers and architects will judge the competition Feb. 18, 1942. Drawings must be received at the executive offices of the American Institute of Steel Construction, 101 Park avenue, New York, not later than Feb. 10.

STEEL

Canada's Lesson in Sincerity

CAN it be possible that one has to leave the United States in order to find out what is wrong with the American defense program?

Last week hundreds of persons directly interested in the problems of American industry went to Canada to attend the nineteenth annual conference of the National Industrial Advertisers Association at Toronto.

In the course of the three-day convention they heard a number of Canadians speak on certain aspects of Canada's contributions to the present war. The American visitors were impressed by a certain quality in these speeches which is lacking in the statements of government officials in the United States.

It is the quality of frankness. One could go even farther and say that it is the quality of frankness which connotes confidence in the public.

• • •

For instance, at a luncheon on Wednesday, Ralph P. Bell, director-general of aircraft production for the Dominion of Canada, described for the American visitors the romantic story of Canada's aircraft production.

He spoke from a speakers' table at which were seated a dozen or more of Canada's chief industrialists. He did not hesitate to credit much of Canada's success in aircraft production to the co-operation of these manufacturers. He spoke plainly and frankly of objectives, obstacles, successes, disappointments, etc.

Many Americans who heard this address were struck with the sincerity of the speaker. He was not trying to sell a bill of goods for the administration for which he is working. Instead he was reporting for the Canadian people, for whom he is working.

He was not speaking as one who is pushing war production as a side line to some obscure social objective. He was talking as an executive whose heart and soul were intent upon the one aim of winning the war—not the Prime Minister's war nor that of his party but the war of the Canadian people.

He was not boasting of the achievements of his division of aircraft production. He was stating the cold facts of the aircraft effort of Canada, to which he, his division, Canadian industry and the Canadian public all are contributing wholeheartedly and without thought as to who is going to get the lion's share of credit for its success.

• • •

Is there a lesson for the United States in this experience?

There is.

Our government can well afford to heed the example of Canada.

Our Washington administration can gain much by being frank, by thinking of our national effort as the people's effort instead of that of the President or of his administration.

Our tactics are approaching those of totalitarianism; Canada's are holding true to the spirit of democracy.

Will we heed the lesson in time?

E. L. Shaner

EDITOR-IN-CHIEF

Sept. 22, 1941

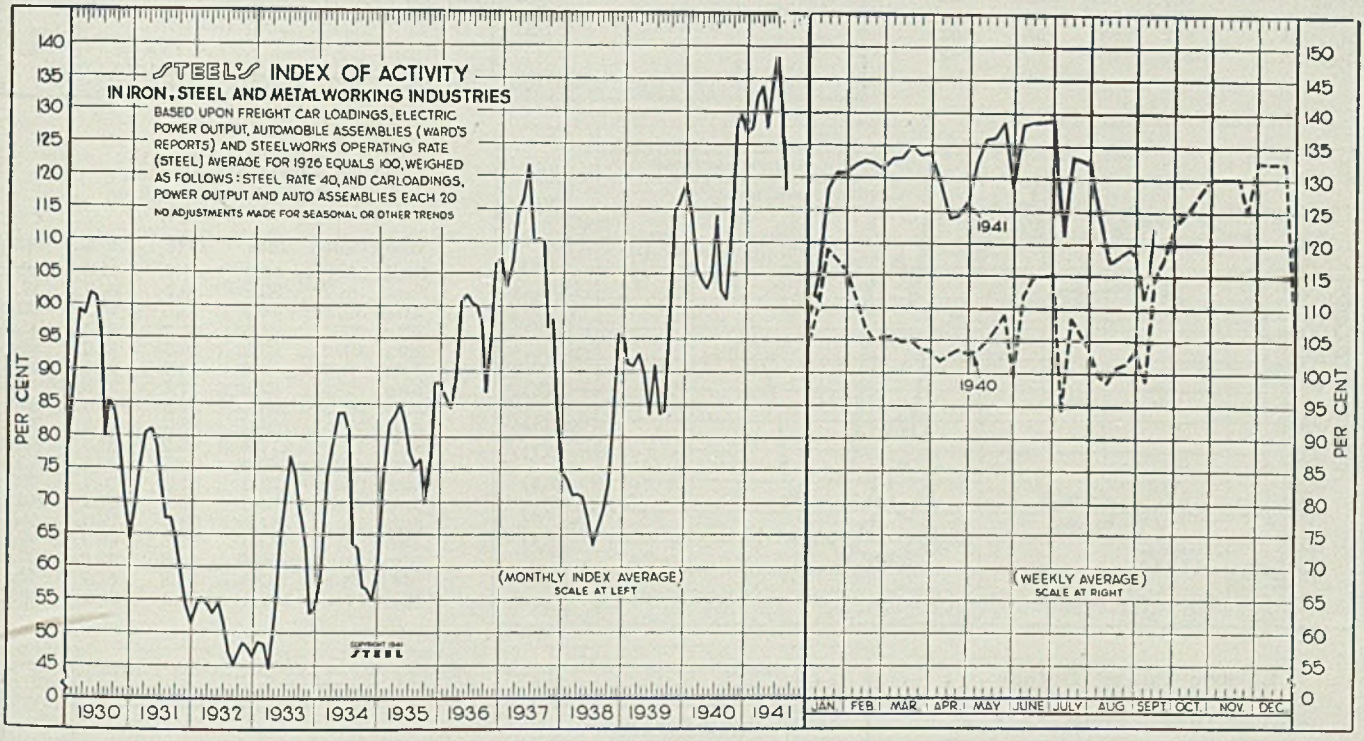
The BUSINESS TREND

Index of Activity Rebounds Sharply

■ DEFENSE expenditures are steadily increasing. Rate of current outlay amounts to $1.2 billions per month, with further gains indicated. Output of those industries directly or indirectly connected with the armament program should record further expansion over the coming months as new plants are brought into operation and tooling programs completed.

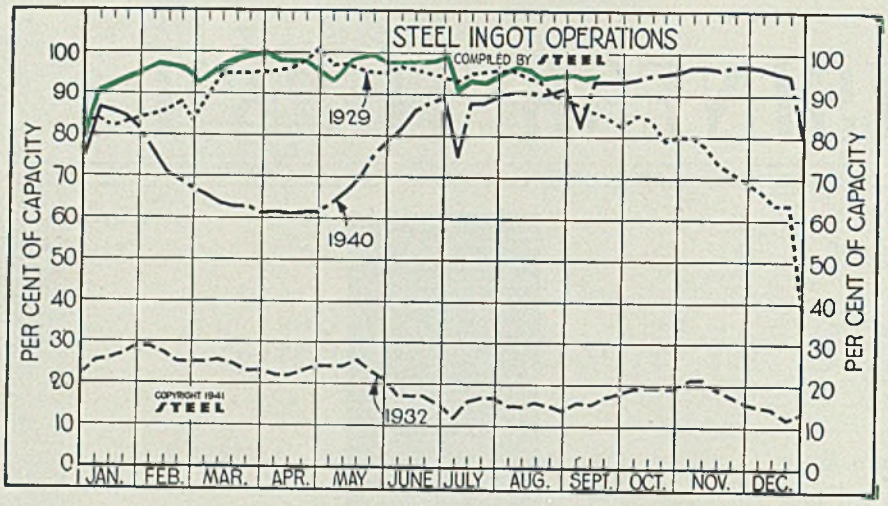
Expansion in the nation's industrial capacity is progressing at a pace never equalled before. Factory construction for this year will nearly double that of 1929 while output of metalworking machinery is expected to treble the volume reported that year.

In the week ended Sept. 13 STEEL's index more than recovered the ground lost during the preceding holiday week. In the latest period the index rose 10.5 points to 122.3, the highest registered since the week of Aug. 2. Electric power consumption and revenue freight traffic climbed to the best level for the year to date, while gains also occurred in steelmaking operations and automobile production.



STEEL'S index of activity gained 10.5 points to 122.3 in the week ended Sept. 13:

Week Ended	1941	1940	Mo. Data	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
June 28	138.8	115.3	Jan.	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6
July 5	120.9	94.2	Feb.	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2
July 12	133.4	108.5	March	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4	98.6
July 19	133.2	108.0	April	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83 6	52.1	52.8	81.0	101.7
July 26	132.9	103.4	May	134.8	104.6	83.4	67.4	121.7	101.8	81 8	83 7	63.5	54.8	78.6	101 2
Aug. 2	123.3	99.7	June	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95 8
Aug. 9	117.5	98.4	July	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9
Aug. 16	118.2	100.8	Aug.	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85 4
Aug. 23	118.5	101.4	Sept.	.....	113.5	95.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7
Aug. 30	118.2	103.5	Oct.	.....	127.8	114.9	83.6	98.1	94.9	77.0	56.4	63.1	48.4	59.2	78.8
Sept. 6	111.8	98.7	Nov.	.....	129.5	116.2	95.9	84.1	106.4	88.1	54 9	52.8	47.5	54.4	71.0
Sept. 13	122.3	114.9	Dec.	.....	126.3	118.9	95.1	74.7	107.6	88.2	56.9	54.0	46.2	51.3	64 8



Steel Ingot Operations

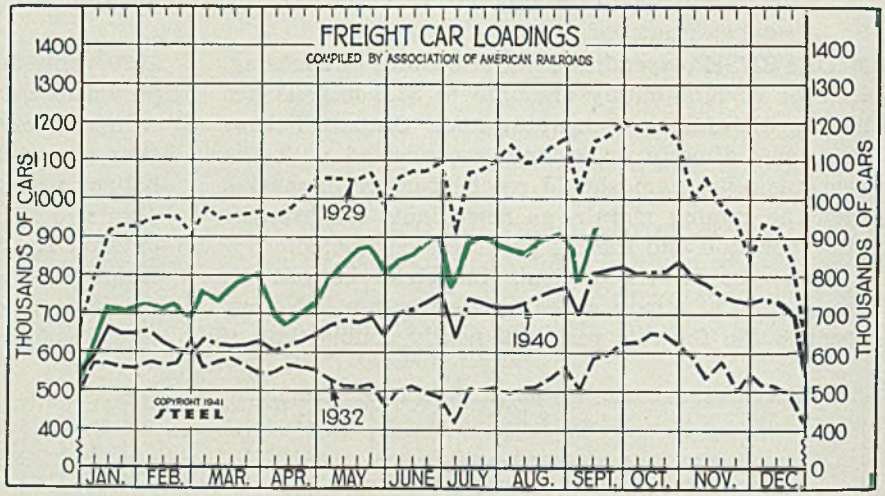
(Per Cent)

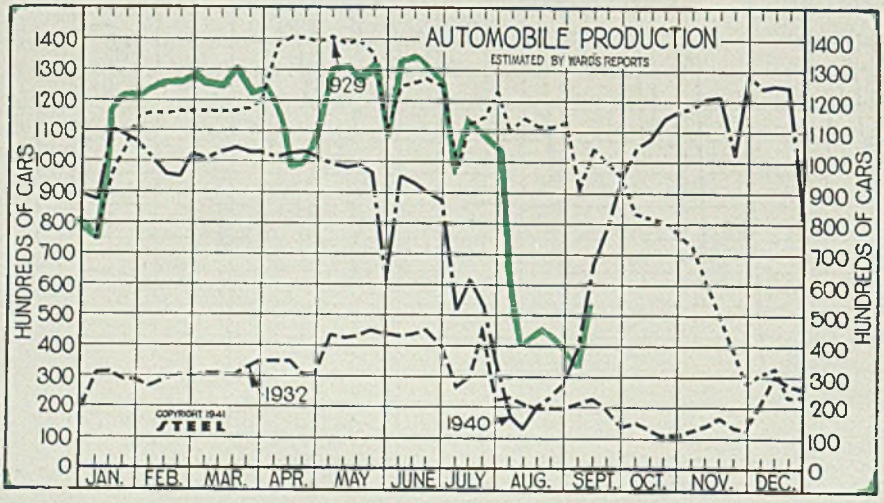
Week ended	1941	1940	1939	1938
Sept. 13....	96.5	93.0	74.0	46.0
Sept. 6....	95.5	82.0	62.0	41.5
Aug. 30....	96.5	91.5	64.0	44.5
Aug. 23....	96.0	90.5	63.5	43.5
Aug. 16....	95.5	90.0	63.5	41.5
Aug. 9....	96.0	90.5	62.0	40.0
Aug. 2....	97.5	90.5	60.0	40.0
July 26....	96.0	89.5	60.0	37.0
July 19....	95.0	88.0	56.5	36.0
July 12....	95.0	88.0	50.5	32.0
July 5....	92.0	75.0	42.0	24.0
June 28....	99.5	89.0	54.0	28.0
June 21....	99.0	88.0	54.5	28.0
June 14....	99.0	86.0	52.5	27.0
June 7....	99.0	81.5	53.5	25.5
May 31....	99.0	78.5	52.0	25.5
May 24....	100.0	75.0	48.0	28.5
May 17....	99.5	70.0	45.5	30.0

Freight Car Loadings

(1000 Cars)

Week ended	1941	1940	1939	1938
Sept. 13.....	914	804	806	660
Sept. 6.....	798	695	667	569
Aug. 30.....	912	769	722	648
Aug. 23.....	900	761	689	621
Aug. 16.....	890	743	674	598
Aug. 9.....	879	727	665	590
Aug. 2.....	883	718	661	584
July 26.....	897	718	660	589
July 19.....	899	730	656	581
July 12.....	876	740	674	602
July 5.....	740	636	559	501
June 28.....	909	752	666	589
June 21.....	886	728	643	559
June 14.....	863	712	638	556
June 7.....	853	703	635	554
May 31.....	802	639	568	503
May 24.....	886	687	628	562





Auto Production

(1000 Units)

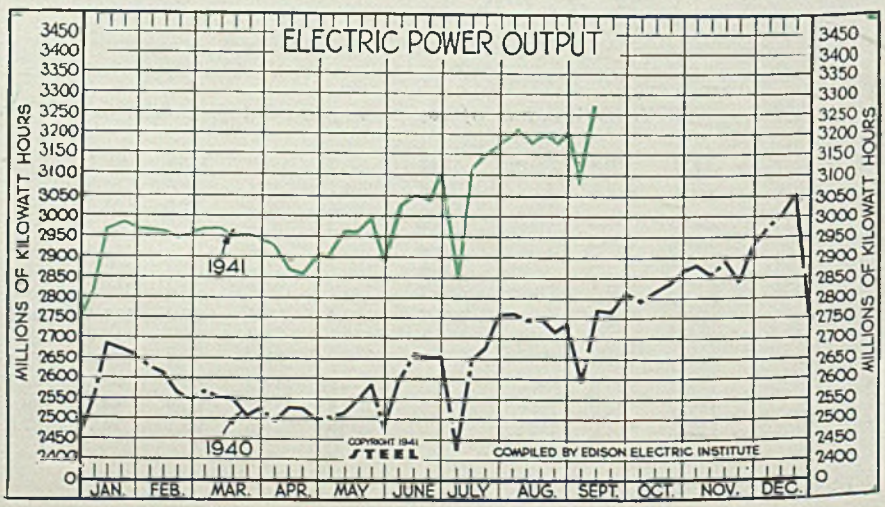
Week ended	1941	1940	1939	1938
Sept. 13....	53.2	66.6	41.2	16.1
Sept. 6....	32.9	39.7	26.9	17.5
Aug. 30....	40.0	27.6	25.2	22.2
Aug. 23....	45.5	23.7	17.5	18.7
Aug. 16....	45.6	20.5	13.0	23.9
Aug. 9....	41.8	12.6	24.9	13.8
Aug. 2....	62.1	17.4	28.3	14.8
July 26....	105.6	34.8	40.6	30.4
July 19....	109.9	53.0	47.4	32.1
July 12....	114.3	65.2	61.6	42.0
July 5....	96.5	52.0	42.8	25.4
June 28....	127.9	87.6	70.7	40.9
June 21....	133.6	90.1	81.1	40.9
June 14....	134.7	93.6	78.3	41.8
June 7....	133.6	95.6	65.3	40.2
May 31....	106.4	61.3	32.4	27.0
May 24....	133.6	96.8	67.7	45.1
May 17....	127.3	99.0	80.1	46.8

Electric Power Output †

(Million KWH)

Week ended	1941	1940	1939	1938
Sept. 13.....	3,281	2,773	2,532	2,279
Sept. 6.....	3,096	2,592	2,376	2,110
Aug. 30.....	3,224	2,736	2,442	2,217
Aug. 23.....	2,193	2,714	2,434	2,202
Aug. 16.....	3,201	2,746	2,454	2,207
Aug. 9.....	3,196	2,743	2,414	2,198
Aug. 2.....	3,226	2,762	2,400	2,194
July 26.....	3,184	2,761	2,427	2,160
July 19.....	3,163	2,681	2,295	2,085
July 12.....	3,141	2,652	2,403	2,154
July 5.....	2,870	2,423	2,145	1,937
June 28.....	3,121	2,660	2,396	2,074
June 21.....	3,056	2,654	2,362	2,082
June 14.....	3,057	2,665	2,341	2,051

†New series: Includes additional governmental and power generation not previously reported.

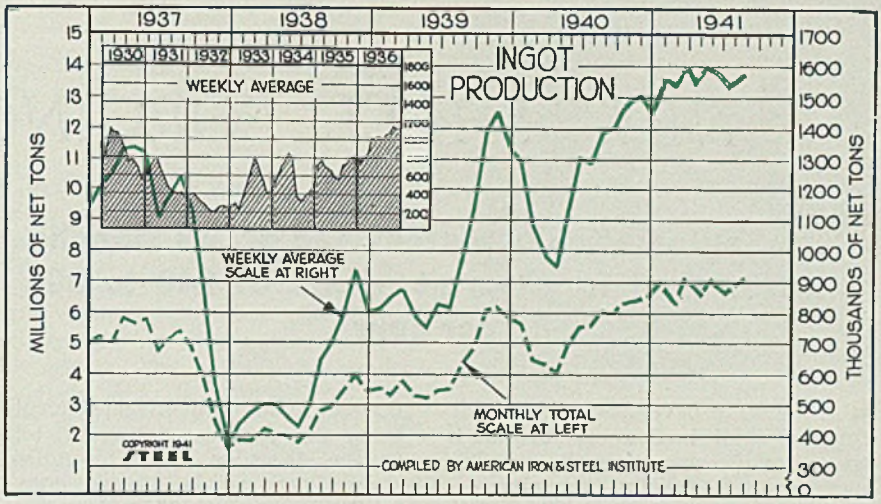


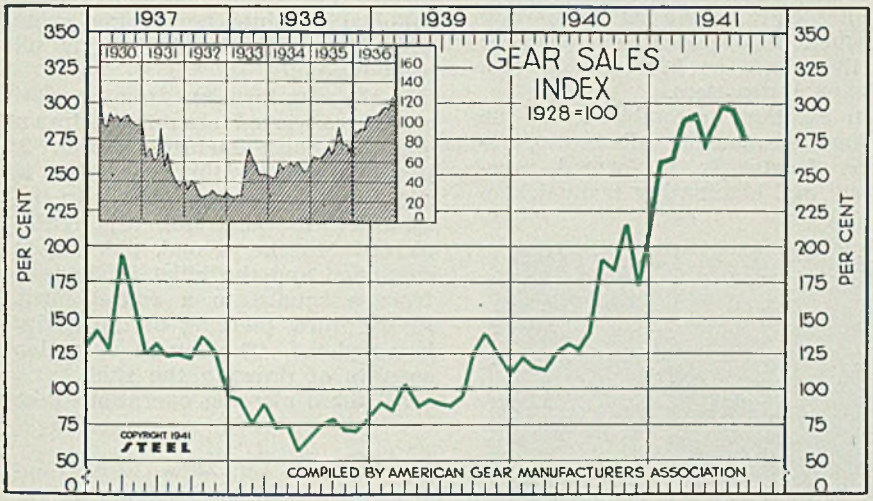
Steel Ingot Production

(Unit 100 Net Tons)

	Monthly Total 1941	Monthly Total 1939	Weekly Average 1941	Weekly Average 1940
Jan.	6,928.8	5,764.7	1,563.9	1,301.3
Feb.	6,237.9	4,525.8	1,559.5	1,093.2
Mar.	7,131.6	4,389.2	1,609.9	990.8
Apr.	6,756.9	4,100.5	1,575.0	955.8
May	7,053.2	4,967.8	1,592.2	1,121.4
June	6,800.7	5,657.4	1,585.3	1,318.8
July	6,821.7	5,724.6	1,543.4	1,295.2
Aug.	7,001.0	6,186.4	1,580.4	1,396.5
Sept.	.....	6,056.2	.....	1,415.0
Oct.	.....	6,644.5	.....	1,499.9
Nov.	.....	6,469.1	.....	1,507.9
Dec.	.....	6,495.4	.....	1,469.5
Total	.....	66,981.7	.....	1.281.2†

†Weekly average.





Gear Sales Index

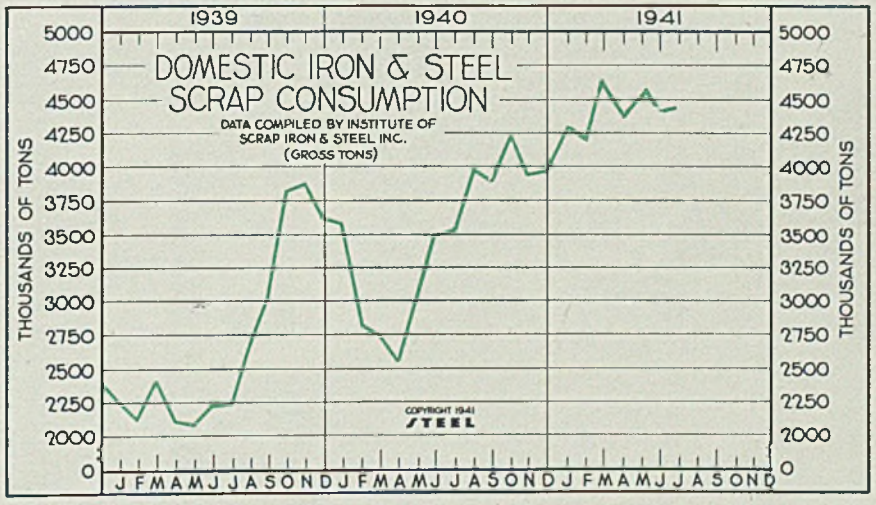
(1928 = 100)

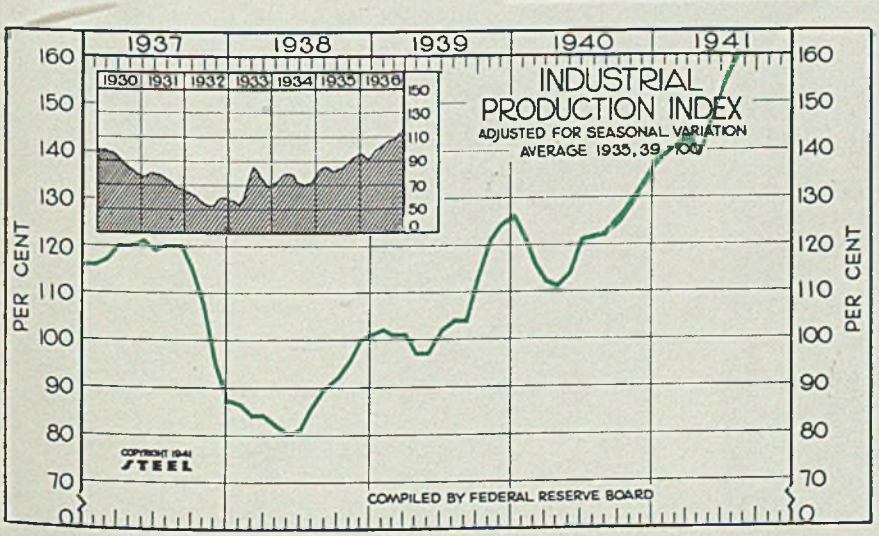
	1941	1940	1939	1938	1937
Jan.	259	123	91.0	93.0	144.0
Feb.	262	116	86.0	77.0	130.5
Mar.	288	114	104.0	91.0	195.0
April	292	128	88.0	74.0	164.0
May	273	133	93.0	70.0	125.5
June	299	129	90.0	58.0	134.0
July	298	141	89.0	67.0	124.0
Aug.	276	191	96.0	76.5	125.0
Sept.	...	183	126.0	80.5	123.0
Oct.	...	216	141.0	72.5	139.5
Nov.	...	173	126.0	72.0	127.5
Dec.	...	208	111.0	81.0	97.0
Ave.	...	155.0	103.0	76.0	135.5

Iron and Steel Scrap Consumption

(Gross Tons)

	1941	1940 (000 omitted)	1939	1938
Jan.	4,278	3,581	2,257	1,331
Feb.	4,172	2,812	2,124	1,306
Mar.	4,662	2,728	2,419	1,543
Apr.	4,406	2,548	2,114	1,477
May	4,609	3,061	2,079	1,387
June	4,406	3,482	2,221	1,257
July	4,415	3,526	2,247	1,520
Aug.	.....	3,968	2,675	1,953
Sept.	.....	3,876	3,018	2,218
Oct.	.....	4,233	3,809	2,393
Nov.	.....	3,922	3,858	2,732
Dec.	.....	3.950	3,613	2,411
Total	.....	41,687	32,434	21,528
Mo. Av.	.....	3,474	2,703	1,794





Industrial Production
Federal Reserve Board's Index

(1935-39 = 100)

	1941	1940	1939	1938	1937
Jan.	139	122	102	86	116
Feb.	141	116	101	84	117
March	143	112	101	84	120
April	140	111	97	82	120
May	150	115	97	80	121
June	157	121	102	81	119
July	162	121	104	86	120
Aug.	...	121	104	90	120
Sept.	...	125	113	92	115
Oct.	...	129	121	95	107
Nov.	...	133	124	100	95
Dec.	...	138	126	101	87
Year Ave.	...	122	108	88	113

NEW SHELL FORGING SYSTEM

. . . . automatically pierces and draws 90-millimeter shell forgings at a rate of 240 to 300 per hour

■ A NEWLY developed method for forging shell bodies employs a 4-stage completely automatic continuous-operation forging machine designed to produce from 240 to 300 finish-drawn 90-millimeter shell forgings per hour directly from hot steel billets. The first of these machines, made by Clearing Machine Corp., 6499 West Sixty-fifth street, Chicago, is already in operation.

An unusual feature of this forging method is the elimination of all manual handling of the shell forging from the placing of the hot billet in the de-scaler until the finished drawn forging is ejected onto a cooling conveyor. Thus fewer men are needed to handle the work, while production is said to be from three to five times as great as on conventional upsetters.

In addition to combining in one automatic machine all the operations frequently performed separately and eliminating manual handling, other innovations include a rotary indexing die table, self-aligning punches and mandrel with automatic stripping, combination roller and ring dies for final drawing of the shell, automatic cooling of the punches and mandrel between each operation, and an automatic lubrication system for dies and punches designed for use of the new shell forging lubricants containing "dag" colloidal graphite now being made available nationally by major oil companies.

In the new forging system, a steel billet is converted into a finish-drawn shell in four operations, Fig. 2. In the first operation, the billet is slightly upset to fit it firmly in the die and at the same time it is lightly pierced. In the second, piercing is continued and the billet is changed from a square to a round form. In the third, piercing of the cavity is completed. The fourth operation consists of drawing the shell.

All three piercing operations take

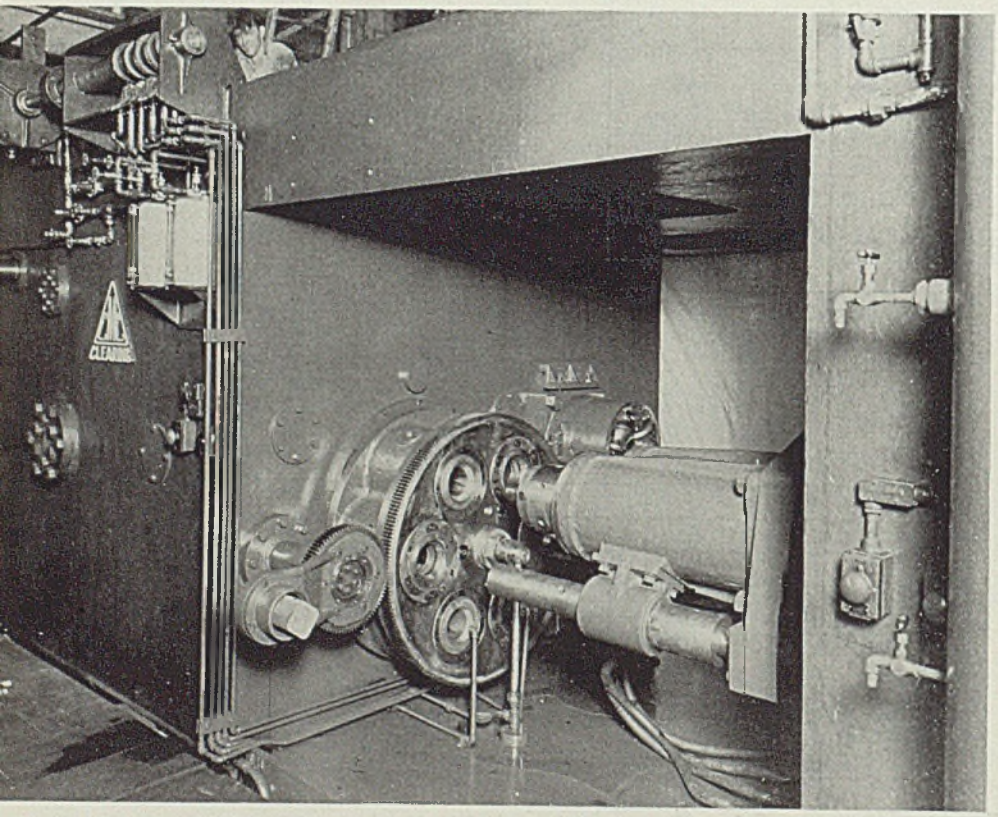
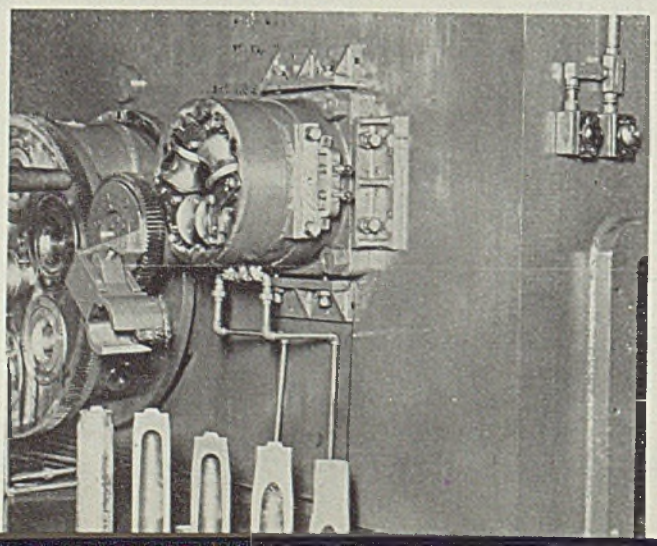
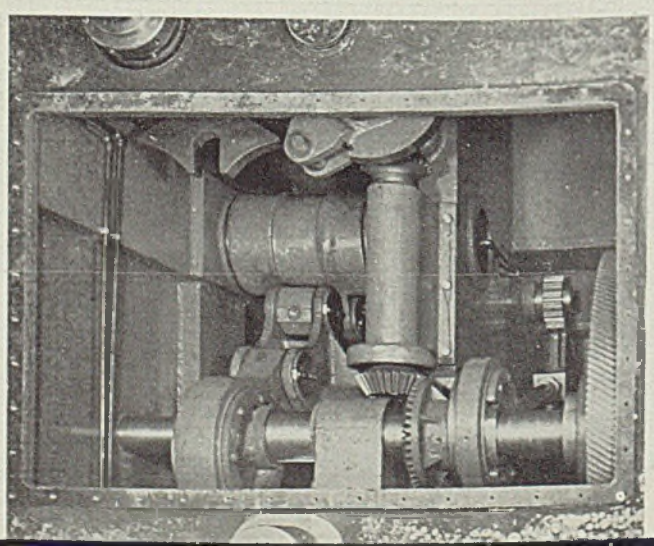


Fig. 1. (Upper Left)—The Clearing automatic shell forging machine from the loading side, with billet in loading carrier. Note cooling stations between dies in the rotary indexing table. Lubricant tanks and cams to control flow of the colloidal graphite lubricant are shown at upper left. Descaler is not shown

Fig. 2. (Lower Left)—Drawing dies are combination rollers and rings. Below the drawing die shown, right to left, are shown cross sections of billet after leaving first punch, after leaving second punch, after finish piercing, and after drawing. A completed unsectioned forging is at extreme left. Note chute at right from which finished forgings are dropped onto a conveyor for cooling

Fig. 3. (Directly Below)—View from rear with cover plate removed to show drive mechanism to die table and to die anvil





place without the work's being removed from the die in the rotary indexing table. Following piercing, the work is automatically transferred from the die table to the drawing dies by means of a transfer carrier.

In addition to the three dies, the die table has three "cooling stations" located one between each pair of dies. After each forward and on the return stroke of the punches, the die table indexes 60 degrees so that a loaded die and a "cooling station" are located alternately in front of each punch.

A summary of the sequence of operations at each punch, etc., is shown in Table I. The hot billet in the loading device, see Fig. 1, is swung in front of the die by the rotation of the die table to which the loading arm is geared. The first punch pushes the billet into the die on the first forward stroke, slightly upsets the square billet to seat if firmly in the die, and pierces the billet lightly.

On the return stroke the aligning guide on the punch strips the work from the punch. At the end of the return stroke, the die table indexes 60 degrees, bringing a cooling station in front of the first punch while the die containing the lightly pierced billet moves around in front of the second punch.

On the next forward stroke, No. 2, the first punch after being cooled in air on the return stroke, is then passing through the cooling station where it is cooled by a controlled hot water spray to bring it back to correct temperature. On the return stroke through the opening in the die table, the punch is evenly sprayed with the colloidal graphite lubricant that forms a slick coating of graphite on the punch to lubricate it for the next operation.

At the same time, the second punch, on the forward stroke, is piercing the shell and converting it from a square to a round shape of the die. On the return stroke the hydraulically operated punch guide strips the shell from the second punch.

The die table now indexes over another 60 degrees, bringing the forging in front of the third punch, a cooling station in front of the second punch, and a fresh billet in front of the first punch.

On the third forward stroke, therefore, the cavity of the first shell is being finished, while the first punch is piercing a second billet, and the second punch is passing through a cooling station. The second punch is spray lubricated on the return stroke, while the shell are being stripped from the first and third punches.

On the next forward stroke, No. 4—after the die table has again indexed 60 degrees—the now finish-pierced shell is pushed out of the die into a carrier, Fig. 2, from the rear of the die, the third and first punches are being cooled and lubricated, while the second punch is piercing and the loading carrier is in position to receive another hot billet.

Next time the die table indexes, the transfer carrier—also geared to the die table and now containing the pierced shell—is swung up in front of the drawing unit. On the next forward stroke, No. 5, the drawing mandrel enters the shell and pushes the shell through a set of roller and ring dies which draw the shell to its proper size.

On the return stroke the now finished shell forging is stripped automatically from the mandrel and delivered through a chute back of the drawing dies, Fig. 2, to a conveyor for cooling.

The next indexing of the table swings the transfer carrier back into position to receive the second finish pierced shell. On the next forward stroke, No. 6, the drawing

(*Please turn to Page 83*)

TABLE I—Sequence of Operations

Stroke	First Punch	Second Punch	Third Punch	Transfer Carrier	Drawing Station
No. 1 Fwd. ...	Pierce No. 1				
Return	Strip No. 1				
No. 2 Fwd. ...	Cool	Pierce No. 1			
Return	Lubricate	Strip No. 1			
No. 3 Fwd. ...	Pierce No. 2	Cool	Pierce No. 1		
Return	Strip No. 2	Lubricate	Strip No. 1		
No. 4 Fwd. ...	Cool	Pierce No. 2	Cool	Load No. 1	
Return	Lubricate	Strip No. 2	Lubricate	Transfer	
No. 5 Fwd. ...	Pierce No. 3	Cool	Pierce No. 2	Unloading	Draw No. 1
Return	Strip No. 3	Lubricate	Strip No. 2	Return	Strip No. 1
No. 6 Fwd. ...	Cool	Pierce No. 3	Cool	Load No. 2	Cool
Return	Lubricate	Strip No. 3	Lubricate	Transfer	Lubricate
No. 7 Fwd. ...	Pierce No. 4	Cool	Pierce No. 3	Unloading	Draw No. 2
Return	Strip No. 4	Lubricate	Strip No. 3	Return	Strip No. 2
etc.	etc.	etc.	etc.	etc.	etc.

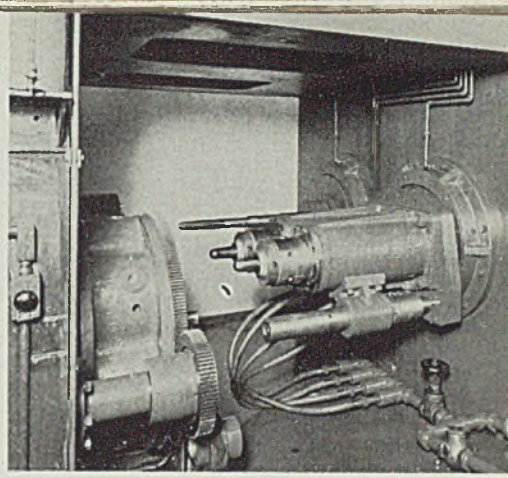


Fig. 5—Closeup of punches, mandrel and guides which also act as hydraulic strippers

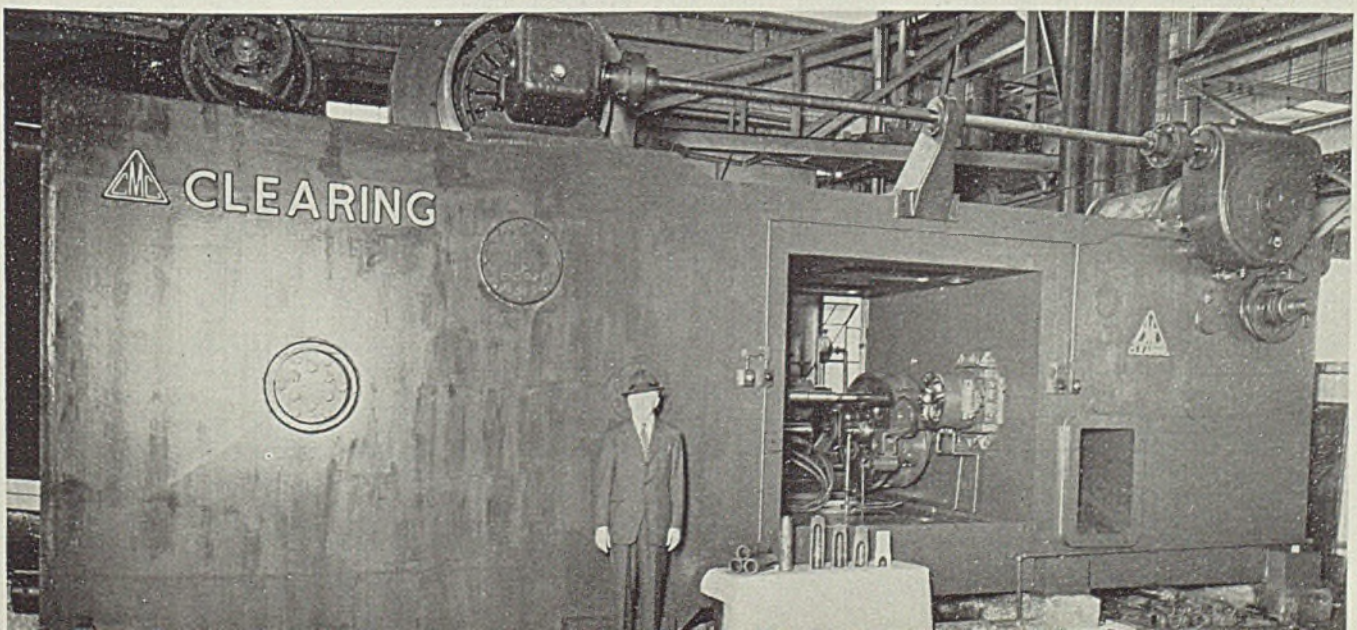


Fig. 4—Overall view of forging machine showing its size, as seen from discharge side

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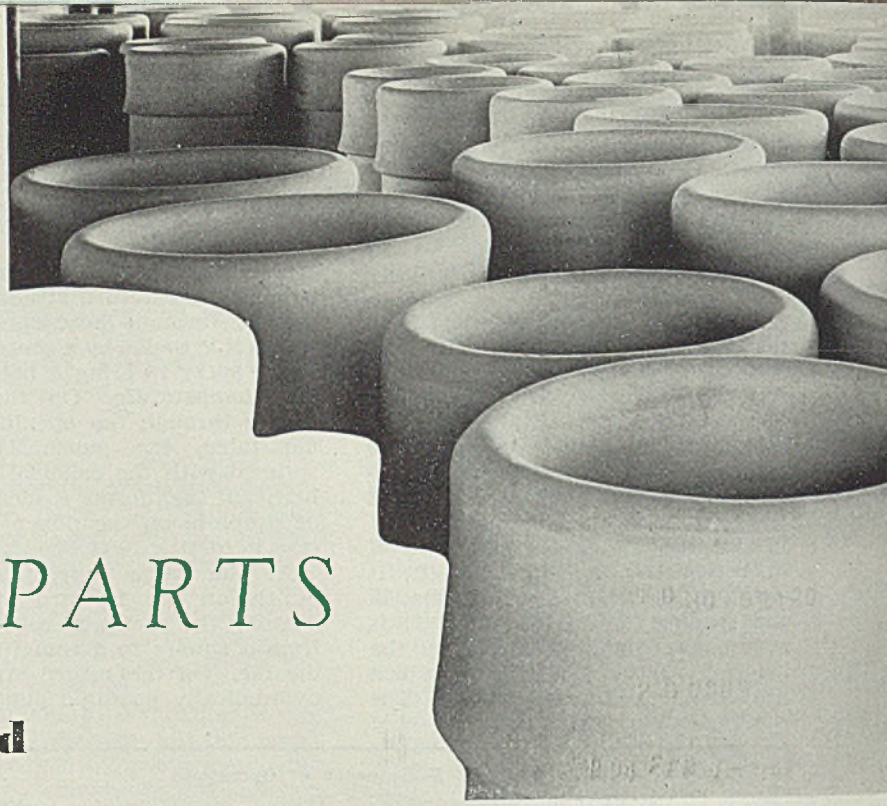
And
Contributing Editor, STEEL



Manufacture of OPTICAL PARTS

For Rangefinders and Fire-Control Instruments

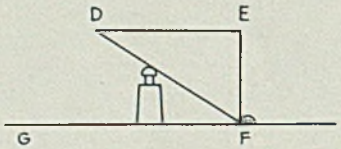
This Is Number 30 in a Series on Ordnance and Its Manufacture, Prepared for STEEL *by Professor Macconochie*

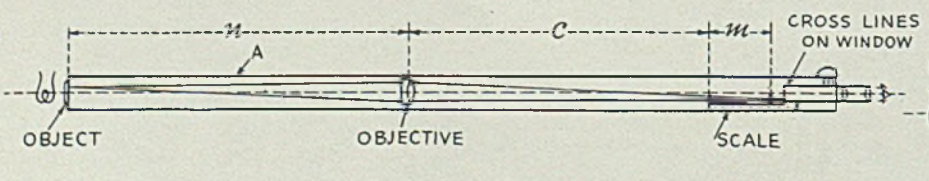
. . . . characteristics and sources of glass and other materials for optical parts; glassmaking practice at Bausch & Lomb; defects and their causes; cutting, grinding and polishing procedures; tests and measurements; correction of defects

■ OPTICAL parts of the rangefinder, in addition to presenting an important problem of mounting, require the greatest care in manufacture, and only the purest raw materials will serve. Following the outbreak of war in 1914, Barr & Stroud's sources of optical glass failed and it became necessary to undertake first the fine annealing in specially designed electric annealing chambers and, later on, the entire manufacture of this essential commodity. So short had supplies become that the production of large size rangefinders was in jeopardy. In this country a similar situation developed. As far back as 1912, William Bausch had employed a Belgian glass maker on experimental work. With this as a beginning production had been established on a modest scale by 1917 when this country entered the war—a nucleus which was rapidly expanded to a production rate of close to 80,000 pounds a month.

Suitable Sand: The author's association with the problem began in the spring of 1915 when it appeared desirable to seek new sources of glass sand within the island of Britain itself. The chief requirements of a glass sand are freedom from iron, evenness and angularity of the grain, and in the case of optical glass, a high degree of chemical purity. The best Europeon deposits occur at Fontainebleau near Paris and at Lippe, Saxony. These sands contain over 99.7 per cent silica and less than 0.03 per cent of iron oxide; and they have a remarkable uniformity of texture. Next come the Belgian sands with some 0.05 per cent iron oxide.

Some British sands have a low iron content, but in general the sand is not so uniform as the sands of Fontainebleau, and many apparently promising deposits of white sands—especially those of the Western Isles of Scotland—proved to be highly calcareous. Even the snow white "singing sands" of the Island of Eigg failed to measure up to the required standards of excellence. (Sands tend to "sing" when disturbed if there is a high degree of uniformity of grain size. The tiny vibration of each grain is thus added to the general chorus, producing a musical note instead of merely making a noise.) The sand used by Bausch & Lomb comes from a locality about 25 miles south of the Pennsylvania





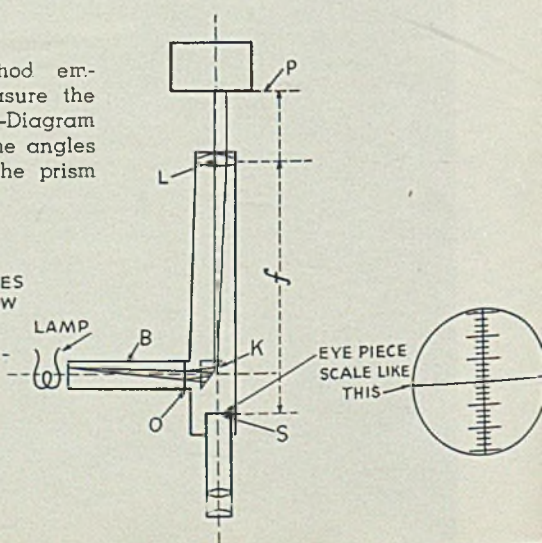
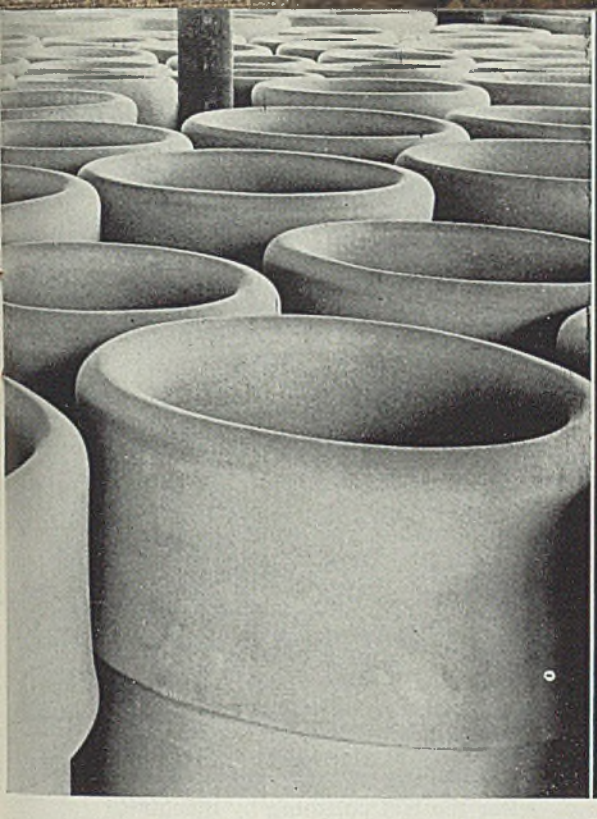


Fig. 4. (Center)—Diagram illustrates method employed by Barr & Stroud, Glasgow, to measure the focal length of the objective. Fig. 5. (Right)—Diagram of elements utilized in system to determine the angles of prisms. Fig. 6. (Left)—Jig for mounting the prism in system shown in Fig. 5



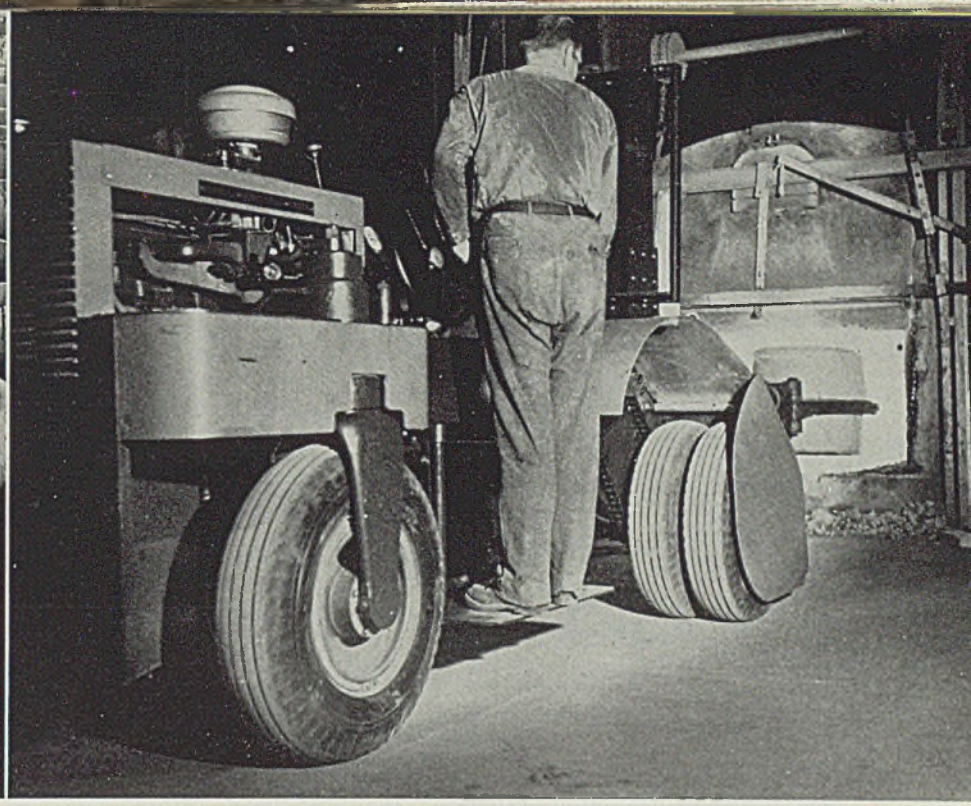


Fig. 1. (Upper Left)—The semiporcelain pots used by Bausch & Lomb for melting optical glass are now made in about three months instead of eight

Fig. 2. (Upper Right)—A new type of gasoline-motor powered transfer truck is used by Bausch & Lomb to handle the glass-melting pots

State college, State College, Pa.

Other Raw Materials: While pure sand is an essential ingredient, many other materials such as alkalies (in the form of soda ash, potash, feldspar), lime, barium corbonate, lead oxide, magnesia, alumina, boric oxide, etc., are required. Practically all of these materials are available from domestic sources with the exception of Chilean nitrates which are imported and purified in this country. Probably over 99 per cent of all glass manufactured consists of a combination of silica and a mixture of two bases, an alkali (soda or potash) and either lead oxide or lime, thus giving us the two principal types of glass known as lime glass or lead glass. The former is the more common, is cheaper, harder and less fusible than lead glass; while the latter has greater luster and brilliance and is chiefly used for cut ware and optical purposes.

The addition of various borates and phosphates improves glass for various chemical and optical purposes as also do zinc and barium, both constituents of German optical glass. By way of indicating the extensive nature of the demand, Bausch & Lomb are now making 24 different kinds of optical glass required not only for rangefinders and height finders, but also for gun sights, photographic lenses, telescopes, binocular field glasses, periscopes, microscopes, drift meters, sextants, aerial mapping projectors, etc.

Practice at Bausch & Lomb: The author was recently privileged to observe the methods employed by Bausch & Lomb in its glass manufacturing division and through the kindness of Mr. Carl L. Bausch, these illustrations of the work in progress have been made available. Fig. 1 shows the semiporcelain pots in which the "batch" is melted. Fig. 2 illustrates the new type of transfer truck employed to transport the molten glass from the furnace to the casting table.

During the past year or more, much work has been done to increase the size of pots used in glass making and to change the method of manufacture from hand-made to cast pots. The pots shown in Fig. 1 are ready for service in three months as compared with the eight months' period previously required. By the hand-made method, the raw clays (carefully selected fireclays) are mixed with a quantity of burnt clay to reduce the shrinkage on firing, are then moistened and allowed to mature for some months. To form the pot, the potmaker molds a disk to form the bottom of the pot and then proceeds to build up the sides, not more than 6 inches of clay being added at a time, since the walls are not strong enough to support the weight of the whole side. When the pot is completed it is allowed to dry slowly, the temperature of the drying room being carefully regulated and precautions taken to prevent drafts. When thoroughly dry—a process which normally takes several months—the pots are placed in a small kiln (the "pot arch") in which they are brought slowly up to a red heat. Much care is required in heating, since different clays require different heating rates. When the pot arch has reached its maximum temperature (900 degrees Cent. or more depending on the clay) the pot is taken out and transferred as rapidly as possible to the glass melting furnace.

The "batch" is the term used to denote the ingredients mixed in correct proportion and ready for melting, these raw materials being mixed with a quantity of previously melted glass of the same composition, known as cullet. Bausch & Lomb use a wash of paint on the outside of the fragments from previous meltings to distinguish them. The pot, when ready for filling, is first glazed with cullet to protect it from direct contact with the raw materials, which exert a powerful fluxing action on the clay of the pot. Thereafter the pot is filled with the raw materials and cullet, several fillings being required, as a rule, since there is a diminution in volume as fusion takes place.

Much Care Required: Since the standard is high, optical glass demands special treatment, a clay stirrer being used to secure homogeneity. Even so, the usable glass is often less than 10 per cent. At the end of the stirring operation, which is continued until the viscosity increases to the point where further stirring is impossible because of falling temperature, the pot is removed from the furnace as quickly as possible and allowed to cool rapidly in order

The author sincerely appreciates the extreme helpfulness of Mr. Carl L. Bausch of Bausch & Lomb Optical Co., Rochester, N. Y., in the preparation of this article.

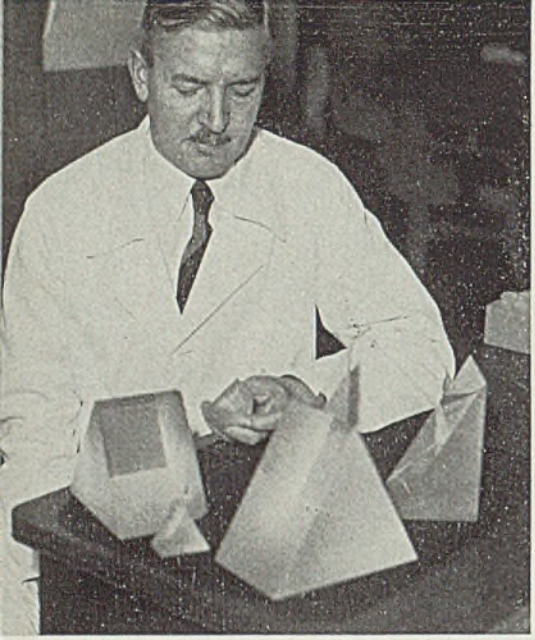


Fig. 3—Made by Bausch & Lomb, these are some of the largest quartz prisms manufactured in this country

to avoid "devitrification." When sufficiently cold the entire mass of glass and surrounding pot is broken up and those pieces which are judged sufficiently free of striae and other defects cut to weight, reheated and pressed to shape in cast iron molds. These molded parts are then annealed to remove internal strain, a process which may take several weeks.

Among the various ills to which glass is heir are "stones," "striae" and "seed." Stones consist of solid particles which have failed to enter into solution of the glass. They may result from roof drips, particles of refractory from the walls or the like, or poor control of the furnace temperature permitting crystallization of the glass. Once formed, these crystals are reabsorbed with difficulty. Coarse particles of the raw material may also be responsible for stones.

Striae consist of veins of glass having a different refractive index from the mean. They may be caused by imperfect mixing of the batch or contamination by the walls of the pot; or poor control of furnace temperature giving rise to viscous retardation of the diffusion of the various constituents.

Seed, or fine bubbles, can hardly be avoided. Even in the finest optical parts, minute defects of this kind are tolerated without important injury to the functioning of the lens or prism. Their presence is associated with the complex and imperfectly understood reactions taking place during the melt. During the process, complex eutectics are formed. The oxides having high melting points dissolve slowly in these, the ease of melting depending largely on the viscosity of these eutectics.

Gas Is Trapped: Owing to the high thermal resistance and viscosity of the mixture, very large temperature gradients occur and in consequence all possible physical and chemical changes do not occur simultaneously in different parts of the pot and thus many bubbles of gas, water, carbon dioxide, etc., are trapped in the molten glass. To facilitate their removal, the temperature of the glass is raised in a process known as "fining" in which the viscosity is reduced and the attack on the material of the pot increased (unfortunately).

Control of color is another problem now largely overcome. In 1914 to 18 the writer observed the operators in the rangefinder adjustment shop of Barr & Stroud "matching" the colors of the optical parts used in the two ends of the instrument lest the upper image be a slightly different shade from the lower. The glass then available was often slightly tinted in delicate shades of green and brown.

Cutting: In making a prism from a rough annealed block, the first operation is to cut the block roughly to shape. This may be done with a thin soft iron disk impregnated with diamond dust at its outer edge. The disk is charged by roughing it with a file and then rubbing the diamond dust onto its roughened edge. The direction of rotation of the disk is then reversed and the rough teeth formed on its edge are closed down over the diamond particles by rubbing against a slit in an agate. A disk charged in this way will cut for four days.

During cutting, the prisms may be fed against the disk by hand. The rate of cutting is surprisingly rapid, a cube 2 inches square being cut through in a few minutes. Fig. 3, kindly supplied by Bausch & Lomb, shows some of the largest quartz prisms ever made in this country. For further information about the defense activity of Bausch & Lomb, see the May-June, 1940, issue of *Army Ordnance*, an account prepared by Carl L. Bausch, assistant chief, Rochester Ordnance District.

Grinding: Next step in the manufacture of rangefinder prisms consists in working them against a cast iron disk charged with carborundum, the prisms being mounted on a jig which locates them by one of their faces or angles and holds them with cement. It was Barr & Stroud (Glasgow), I believe, who first adapted ordinary traversing-table machine-shop grinders to this class of work by fitting them with special gearing to give a much lower wheel speed than usual. The rough ground prisms are then subjected to a smoothing operation similar to rough grinding, but using a finer grade of carborundum.

Finally the work is given a rough and then a finish polish with rouge, a goniometer test being applied intermediately so that errors may be corrected if necessary by further grinding before the finish polish. After the last polishing by machine, a final touching up is usually necessary to secure perfection. This is done by hard rubbing the prisms on a pitch face plate fed with rouge, the rouge being held by shallow grooves in the plate. These finishing processes require a high degree of skill since the desired result may be secured only by departing from a plane surface as a result of local variations in the character of the glass. The flatness of prism surfaces is determined by the "Newton's Ring" test, the prism being placed on a quartz proofplate.

Lens Polishing: The procedure followed in lens grinding and polishing is somewhat similar to that outlined for prisms, the lenses being mounted on a jig with cement and smoothed and polished in batches. They are, of course, quite close to form before grinding, being molded hot in dies as previously described. The disk in this case is replaced by a grinding tool like a large shallow inverted cup made to the form required by the particular lens being worked, and fed

with carborundum or rouge according to the operation.

The type of machines worked out by Barr & Stroud for this operation consisted of a continuously running horizontal shaft carrying friction disks which drove friction wheels mounted on a series of vertical shafts. These vertical shafts drove the grinder holders through a link motion and the lens mounting through belts. The lens holders and grinder holders both rotated, but the link motion gave the latter an eccentric movement around the vertical line through the lens holder to avoid ridging of either the tool or the work. This principle is well established in glass polishing operations, a combination of rotation and translation between the working surfaces being essential.

Testing: Prior to assembly of the optical parts in their various positions in the rangefinder, various tests and measurements are applied. For instance the end pentagonals are carefully examined for any flaws and then subjected to observation between crossed Nicol prisms. Any strain produces gray or brighter polarization tints according to its intensity.

Optical glass is sensitive stuff. The author has watched with interest the creep of strain through a large pentagonal as a result of placing the finger on the block. The deviation of the prism is then measured by means of a spectrometer with slit removed; and definition is investigated with a collimator and telescope. Irregular surfaces or strain in the glass produce bad definition, while sphericity will displace the image.

The objective lens of the telescopic system of the rangefinder is first examined for definition by mounting in a telescope and observing the image of a board with rows of holes in it, by means of a high powered eyepiece. If both elements of the achromatic objective are astigmatic, this defect may be lessened by their relative rotation. The presence of astigmatism is indicated by lack of sharpness of the images of the holes or even "ghost" images displaced from the principal image. Bad contact of crown and flint will produce "flare," and care must be taken to see that they are tightly pressed together. The measurement of the focal length of the objective is undertaken principally to enable assembly of the optical parts to be so made that there will be equal magnification of the image in both parts of the field of view. This does not necessarily mean that objectives of the same focal length are paired in all cases, since slight sphericity of the other optical parts may require correction. However, in the normal case, pairs of objectives of equal focal length would be used in the same instrument.

Checking Focal Length: The method employed is illustrated in Fig. 4. A small tube carrying eyepiece, cross wires and scale slides in the larger outer tube A. When the image of the illuminated star and the cross wires are in the same plane, as determined by moving the eye a little from side to side, the focal length is given by the equation: 1/n plus 1/(c plus m) equals 1/f where "n" is the distance from the object to the optical center of the objective, "c" the distance from the optical center of the objective to the zero of the scale and "m" is the scale reading. Here "f" of course is the principal focal length. All that we really require is "m" so that one objective may be paired with another.

The measurement of the angles of the prisms in the central eyepiece prism combination is carried out by the arrangement shown in Fig. 5. Light from the lamp enters the tube B and illuminates an object at O, let us say. Light from this illuminated object is now reflected at right angles to the axis of the lens L whose focal length is OKL. Thus the beam will emerge from the lens in parallel rays, incident on the face of the prism P which is set on a jig as shown in Fig. 6.

The jig is so arranged that when the prism is in place, if a is the correct value of the angle DFE, angle DFG equals 90 degrees minus a. Partial reflection throws back the incident beam through the lens and brings the image of the illuminated object to a focus in the plane of the eyepiece scale "S," Fig. 5. The deviation of the face FE from its correct inclination may then be determined. If "f" be the focal length of the lens, then the width of each division on a *minute* scale would be 2(3.1416) f.2/60 x 360.

After assembly of the eyepiece prisms (the arrangement of these prisms was described in STEEL, Sept. 8, 1941, p. 62) an object infinity is viewed through the combination with a telescope. Strain and surface defects are thus exposed. Readers familiar with the principles of optics may recall that if an illuminated object be placed at the principal focus of a lens, the emergent rays are parallel, as they would be if the object were situated at an infinite distance.

The parallel windows through which the light from the target passes to the pentagonals are similarly examined for definition by collimator and telescope; and for parallelism. If prismatic, the image will have a circular motion. The deviation of the prism—that esential element of the rangefinder which enables us to attain "coincidence"—is determined by placing the prism under test in front of the object glass of a telescope and training the latter on a board marked with a suitable scale.

The concluding article in this series on fire control instruments next week will include a description of manufacturing procedure involved in mounting and assembling the parts of a naval rangefinder.

Esso Announces "Dry" Oil for Industrial Use

■ New industrial oils containing colloidal graphite for high-temperature lubrication to prevent metal-to-metal contact (above 400 degrees Fahr.) are announced by Esso marketers. These, under high temperatures, gradually vaporize, leaving no residue but only a fine film of "dry" colloidal graphite.

Under friction and heat this film is adsorbed by the surface material, forming what is known technically as a graphoid surface. Lubrication from that point on is entirely "dry"

Known as Van Caloria oils, the lubricants are available in several viscosities to suit varying lubricating conditions and methods. They are black in color, due to the graphite. These lubricants are being distributed by Standard Oil Co.'s of New Jersey, Pennsylvania and Louisiana; the Colonial Beacon Oil Co.; and Penola Inc.

Classification of Iron, Steel Scrap Available

■ Printed copies of simplified practice recommendation R58-36, "Classification of Iron and Steel Scrap", are again available at the office of the superintendent of documents, Government Printing Office, Washington, according to an announcement by the Division of Simplified Practice, National Bureau of Standards.

This recommendation, which specifies classes of scrap for blast, basic open-hearth, acid open-hearth, and electric furnaces for gray iron foundry practice, bessemer converters, and for miscellaneous scrap, and which includes a contract form for purchase of scrap, has been in continuous demand. This is because it is the governing specification for all iron and steel scrap except two grades, listed in the price schedule for iron and steel scrap issued by the Price Stabilization Division of the Advisory Commission of the Council of National Defense. Each copy is available for 5 cents.

AIRCRAFT MATERIAL SPECIFICATIONS

Now Being Standardized Rapidly

■ UNDER the general leadership of the Aeronautics Division Committee of the Society of Automotive Engineers, 33 subcommittees are working under four subdivision committees on a wide range of standards for aircraft engines, accessories and equipment, propellers, materials and processes. This is in accordance with the assignments and allocation of work made by OPM.

The subdivision concerned with aircraft materials and processes is engaged in furnishing the activities carried on by the Aircraft Materials Division of the SAE standards committee prior to the launching of the present comprehensive standardization program. A large number of aeronautical materials specifications, known as the AMS series, were developed by this group. The specifications which have been prepared consist of complete procurement specifications, and the chemical compositions of the steels included in this series are premised upon the composition of the standard SAE steel series and nonferrous metals. These specifications are now being adapted to the needs of the aircraft manufacturers, and more than 156 materials specifications have been approved and issued.

Working under this materials and processes subdivision—chairman of which is J. B. Johnson, materiel division, United States Army Air Forces, Wright Field, Dayton, O.—are two committees, one concerned with materials and processes for aircraft engines and the other with airframe materials and processes. Chairman of the engine group is B. Clements, Wright Aeronautical Corp., Paterson, N. J., while L. D. Bonham, Lockheed Aircraft Corp., Burbank, Calif., heads the airframes committee.

Both of these committees have United States Army and Navy representation to co-ordinate the materials specifications with the military services. Steel company representatives also have co-operated in preparation and revisions of the specifications.

The current list of AMS specification numbers covering carbon and alloy steels is shown in Table I. These, of course, do not detail the complete specifications but will enable the reader to determine what products and what composition of steel are referred to by the different AMS specifications. Complete descriptions of any or all specifications may be obtained from the Society of Automotive Engineers Inc., 29 West Thirty-ninth street, New York.

TABLE I—List of Aeronautical Material Specifications

Specification Number		Processes
AMS	2400	Plating ..... Cadmium
AMS	2470	Protective Treatments ..... Aluminum Alloys
AMS	2475	Protective Treatments ..... Magnesium Alloys
AMS	2503	Finishing, Black ..... Low Baking
AMS	2510	Finishing, Engine Gray ..... Low Baking
AMS	2560	Impregnation ..... Magnesium Alloy Castings
AMS	2601	Pressure Testing ..... 10 lb. per sq. in.
AMS	2604	Pressure Testing ..... 40 lb. per sq. in.
AMS	2606	Pressure Testing ..... 70 lb. per sq. in.
AMS	2616	Pressure Testing ... 200 lb. per sq. in. (Hydraulic)
AMS	2620	Pressure Testing .. 1000 lb. per sq. in. (Hydraulic)
AMS	2625	Pressure Testing .. 2500 lb. per sq. in. (Hydraulic)
AMS	2640	Magnetic Inspection
AMS	2800	Identification ..... Machined Parts
AMS	2804	Identification ..... Castings
AMS	2808	Identification ..... Forgings
		Non-Metallics
AMS	3080	Compound ..... Anti-seize
AMS	3110	Primer ..... Zinc Chromate
AMS	3120	Enamel, Black ..... Glyceryl Phthalate
AMS	3125	Enamel, Engine Gray ..... Glyceryl Phthalate
AMS	3180	Thinner ..... Toluol
AMS	3220	Rubber ..... Synthetic
AMS	3230	Gasket ..... Oil Resistant
AMS	3232	Gasket ..... Oil Resistant (300° F)
AMS	*3385	Markers ..... Ignition Cable, Non-Metallic
AMS	3410	Flux ..... Brazing (Silver)
		Aluminum Alloys
AMS	4000	Sheet .... Aluminum—99.7 Aluminum . Annealed
AMS	4003	Sheet .... Aluminum—99.0 Aluminum .. 2S1/2 H
AMS	4015	Sheet ..... Aluminum Alloy — Magnesium, Chromium 52SO
AMS	4016	Sheet ..... Aluminum Alloy — Magnesium, Chromium ..... 52S1/4 H
AMS	4030	Sheet ..... Aluminum Alloy—Copper, Manganese, Magnesium 17SO
AMS	4032	Sheet ..... Aluminum Alloy—Copper, Manganese, Magnesium 17ST
AMS	4035	Sheet .... Aluminum Alloy—Copper, Manganese, Magnesium 24SO
AMS	4037	Sheet ..... Aluminum Alloy—Copper, Manganese, Magnesium 24ST
AMS	4070	Tubing ... Aluminum Alloy — Magnesium, Chromium 52SO
AMS	4080	Tubing ... Aluminum Alloy—Manganese, Silicon, Copper 61SO
AMS	4082	Tubing ... Aluminum Alloy—Manganese, Silicon, Copper 61ST
AMS	*4118A	Bars ..... Aluminum Alloy—Copper, Manganese, Magnesium 17ST
AMS	4125	Forgings .. Aluminum Alloy — Silicon, Magnesium, Chromium A51ST
AMS	4130	Forgings .. Aluminum Alloy—Copper, Silicon, Manganese 25ST
AMS	4135	Forgings .. Aluminum Alloy—Copper, Silicon, Manganese, Magnesium 14ST
AMS	4145	Forgings .. Aluminum Alloy—Copper, Silicon, Magnesium, Nickel 32ST
AMS	4210	Castings ... Aluminum Alloy—Silicon, Copper, Magnesium ..... Aged
AMS	4212	Castings ... Aluminum Alloy—Silicon, Copper, Magnesium ... Precipitated
AMS	*4214	Cast Aluminum Alloy—5% Silicon ..... Solution and Overaged
AMS	4280	Castings, Die—Aluminum Alloy—Silicon 13
		Magnesium Alloys
AMS	4350	Wrought .. Magnesium Alloy—Aluminum, Zinc, Manganese
AMS	4360	Forgings .. Magnesium Alloy—Aluminum, Zinc, Manganese
AMS	4370	Sheet ..... Magnesium Alloy—Aluminum, Zinc, Manganese ..... Annealed
AMS	4420	Castings .. Magnesium Alloy—Aluminum, Zinc, Manganese ..... As Cast
AMS	4422	Castings .. Magnesium Alloy—Aluminum, Zinc, Manganese ..... Solution
AMS	4424	Castings .. Magnesium Alloy—Aluminum, Zinc, Manganese ..... Precipitated
AMS	*4434	Cast Magnesium Alloy ..... Solution Precipitation Heat Treated
AMS	4490	Castings, Die — Magnesium Alloy—Aluminum, Zinc, Manganese ..... As Cast
		Copper Alloys
AMS	4500	Sheet—Copper ..... Annealed
AMS	4505	Sheet—Brass ..... Annealed
AMS	4510	Strip—Phosphor Bronze ..... Spring
AMS	4520	Strip—Bronze ..... Bushings
AMS	*4555	Tubing—Brass ..... Light Annealed
AMS	4610	Rod or Bar—Free Cutting Brass ..... 1/2 Hard
AMS	*4612	Rods and Bars—Naval Brass ..... Hard
AMS	*4614A	Forgings—Brass
AMS	4619	Forgings—Manganese, Bronze
AMS	*4625A	Rods or Bars—Phosphor Bronze ..... Hard
AMS	*4630A	Rods, Bars or Forgings—Aluminum Bronze.. Hard
AMS	*4632	Rods or Bars—Aluminum Bronze
AMS	4640	Bars and Forgings—Aluminum Bronze, Nickel, Iron, Manganese ..... Heat Treated
AMS	4650	Bars and Forgings — Beryllium Bronze, 2% Beryllium ..... Hard
AMS	*4665	Tubing, Seamless—Copper, Silicon, Bronze
AMS	4720	Spring Wire—Bronze, 5% Tin ..... Solution
AMS	4750	Solder—Tin Lead, 50-50
AMS	4755	Solder—Lead Silver, 95-5
AMS	4770	Brazing Alloy—Silver, 50% Silver, Copper, Zinc, Cadmium
AMS	4800	Bearings—Babbitt
AMS	*4805	Bearings—Sintered—Bushings

(*Please turn to Page* 84)

EVERY minute saved by preventing unnecessary interruptions to production, becomes an extra minute of useful, productive time.

Better tooling—with the aid of Matched Tool Steels—is saving precious minutes—hours—even days.

In plants that follow the Carpenter Matched Set Method, excessive time out for repairs and replacement of prematurely worn or broken tools is reduced to a minimum. The productive time gained is a real contribution towards *extra* plant capacity.

Behind the nine Carpenter Matched Tool Steels is an abundance of helpful information that is making it easier to obtain these results.

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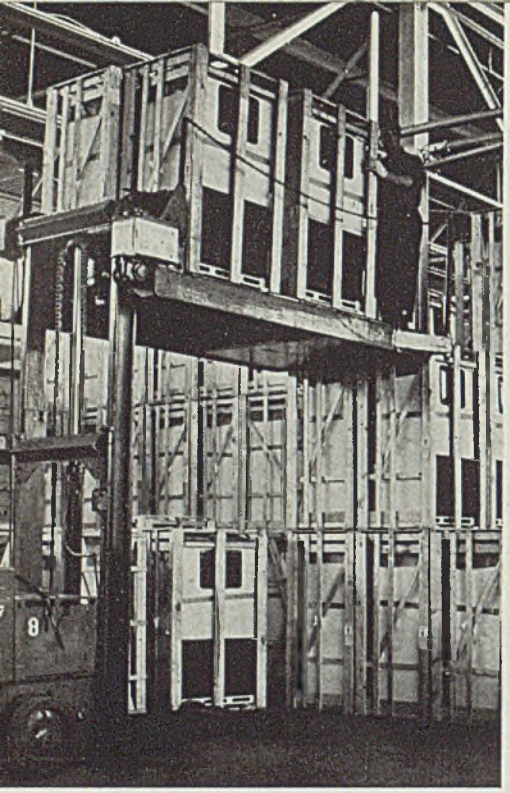


Fig. 1—By means of two sets of rollers on the platform, the packaged product can be removed from either the end of the platform as shown here or from the side of the platform

New Method of HANDLING

. . . . finished product uses roller-platform high-lift truck for movements between ends of assembly lines, storage and shipment. Method is modification of that employed for handling incoming materials

■ TO COMPENSATE for differences between production and seasonally varying sales, the Nash-Kelvinator Corp. maintains a huge stockroom for finished refrigerators at its Detroit plant. It covers 246,400 square feet of floor space, all on one level. During the early spring months, just before shipments for the peak selling season begin to move out, the stock accumulated from the winter's production virtually fills it with refrigerators stacked three high. Along two sides are loading docks and two rail lines, each accomomodating 24 cars, while a loading dock along a third side accommodates 40 highway trucks.

The finished refrigerators, crated for shipment, reach the stockroom on gravity-roll conveyors from the ends of assembly lines on the floor above. The distance from the delivery ends of the conveyors to the nearest shipping point is approximately 40 feet, and to the farthest shipping point approximately 450 feet.

The handling method first employed consisted of a combination of hand trucking, one refrigerator at a time, and power trucking, three at a time, depending upon the distance, while portable electric elevators handling one at a time were employed for stacking.

A refrigerator is comparatively bulky in proportion to its weight. A medium-size model, crated, measures 26 x 32 x 60 inches but weighs only 300 pounds. Because of their bulk, it would have been difficult to combine a number of them into one handling unit using existing industrial trucks for both horizontal transportation and stacking.

Nevertheless, the company's success with the skid-lift-truck system in the handling of incoming materials convinced the management that the principle of combining materials into unit skid loads for power handling is fundamentally sound. Here, a continually increasing proportion of the materials were being received in skid packages, and in some cases, such as metal stampings, the company had adopted the plan of furnishing its suppliers with skid boxes in order to simplify receiving storage and delivery to manufacture.

As a basis for applying the same principle to the handling of finished refrigerators, it was decided that aisles and other clearance limitations would permit handling six refrigerators as a unit. Six of the largest size arranged upright in two

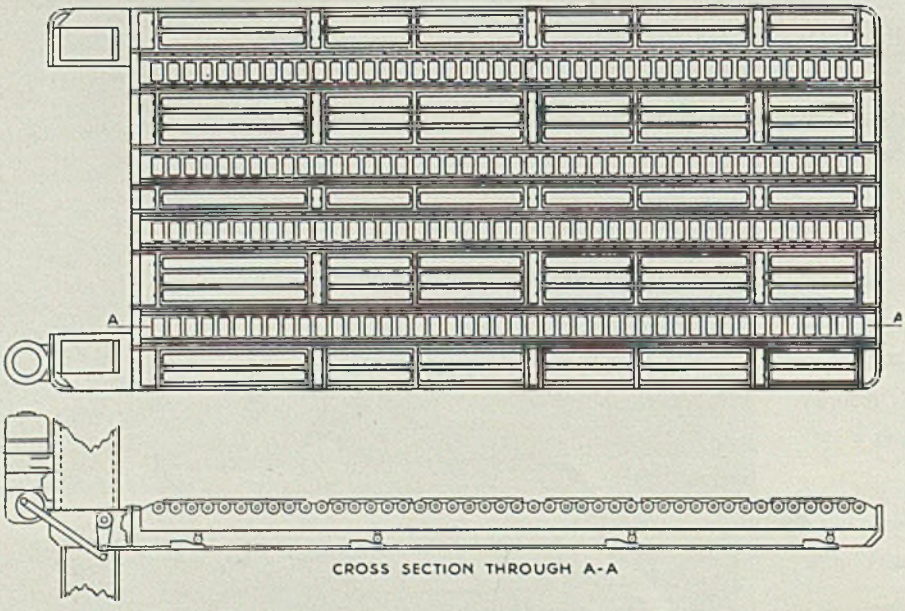
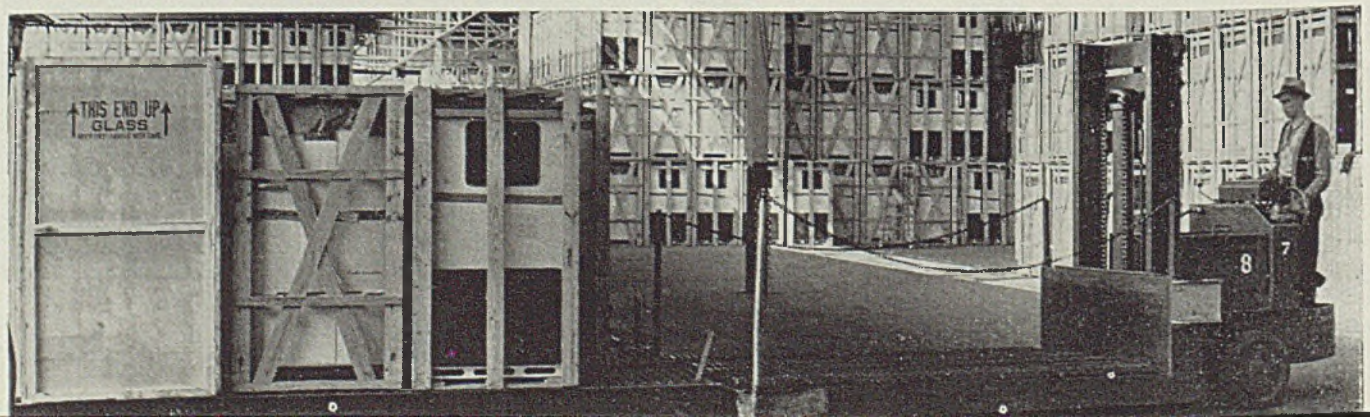
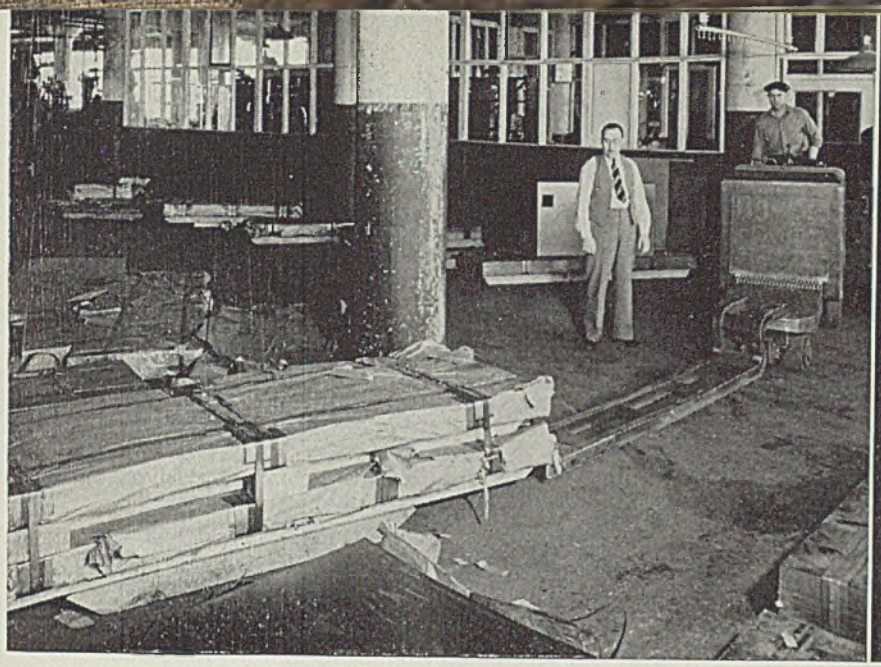


Fig. 2. (Left)—This diagram shows how the two sets of rollers are arranged on the surface of the truck lift platform. Note the method by which one set is raised and depressed

Fig. 3. (Below)—The crated refrigerators are run on the platform of the high lift truck directly from the end of the production line roller conveyor as shown here





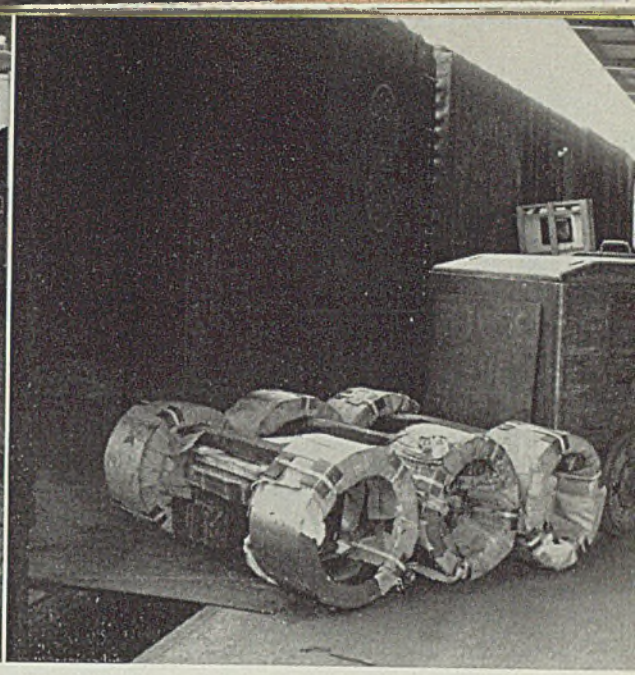


Fig. 4—The long dolly at left has a roller at its front end which allows the front end of the dolly to just slide under skid packages. Then the package can be lifted and moved about the plant by means of the low-lift elevating-platform truck shown. Note how material is stored in aisleways at an angle to accommodate the long dolly and truck. Photo by Baker Industrial Truck Division, Cleveland

Fig. 5—By using a series of 4 x 4 timbers, coil stock can easily be handled by a lift truck as shown at the right. This arrangement is especially useful where coil stock handled is not sufficient to warrant the use of a ram or fork truck

rows of three would occupy a floor space of 9 x 5 feet.

Skid or pallet platforms were decided against partly because of the size that would be required and partly because of the difficulty of loading them at the conveyors and unloading them at the shipping docks—considerations that outweighed the possible savings in the number of handlings incidental to tiering and detiering in stock.

Instead, a special roller-platform high-lift truck was designed in cooperation with the truck manufacturer. The lifting platform, believed to be one of the largest ever built, is provided with two series of rollers, one lengthwise and the other crosswise, one of which may be raised or depressed by the truck operator. See accompanying illustrations.

This permits the refrigerators to be rolled on or off very quickly and easily at either the sides or the end. In picking up a load, the truck is run head-on to the delivery end of the conveyor, and the refrigerators are pushed on, six at one time. A safety retaining chain is then hooked in place.

The reverse procedure is then followed either in the stock room or at the shipping dock. In the stock room, the load is elevated as necessary for tiering. Either series of rollers is used, depending upon whether it is more convenient to remove the refrigerators from the side or end.

The elevating platform type of truck was chosen in preference to the fork type, partly for better stability during travel and partly because, in carrying the loads lengthwise instead of crosswise, the space limitations, especially in the aisles, are more easily met.

The average weight of the loads, including platform, is only 2800 pounds, and the maximum lift is only 10 feet, so the 24-cell steel-alkaline Edison-type A8 batteries provide ample capacity for 12 hours of operation and, when exchanged at approximately these intervals, afford continuous 24-hour operation of the trucks.

The batteries are exchanged by means of a hoist and overhead tramrail. The arrangement of the charging equipment is noteworthy in that a separate control panel is mounted opposite each battery beside the bench. Charging cables are brought overhead from the panels to the benches through automatic adjusters, thus enabling charging either in truck or on the bench.

Trucks were furnished by Baker Industrial Truck Division, Baker-Raulang Co., 2168 West Twenty-fifth street, Cleveland.

As already pointed out, the incoming materials, to a very large extent, are received on skids and are handled by means of low-lift elevating-platform trucks. These include stampings and other semi-fabricated parts in skid boxes and flat steel stock. This material cannot be picked up from the car floor by the lift trucks in the usual way but the management has designed a dolly which is inserted underneath, then is raised at one end and pulled to the storeroom by one of the trucks.

A special arrangement is employed for handling coil stock which, like the sheets, is not received in volume sufficient to warrant the use of a ram-fork truck. The method consists merely of laying 4 x 4-inch timbers across the truck platform so as to project on both sides. The coils are then rolled into position on both sides of the truck platform, the 4 x 4's inserted and the platform elevated. Depending upon their size, one truck can handle up to 12 coils.

Many semifabricated parts are received from local suppliers in skid boxes furnished by the company so that they may be unloaded and moved through stock to process without breaking bulk. Materials are, for the most part, handled on skids through the storeroom to the start of the manufacturing process. Some of the starting processes, such as washing of small metal parts, are performed in skid-load units, in which case, the lift truck carries on.

To a large extent the skid-lift truck system is employed for the handling of scrap. Metal turnings, for example, are collected in self-dumping skid boxes which are removed by lift truck.

"Bolts, Nuts and Screws"

■ A booklet entitled "Bolts, Nuts and Screws", containing reprints of 14 published technical articles is announced by Lamson & Sessions Co., Cleveland. It embodies thoroughly illustrated material covering screw threads, cold forging, fatigue strength, effects of methods of manufacture and other factors involved in the production of bolts, nuts and cap screws.

The booklet was prepared from material that originated currently in leading technical journals in this country.

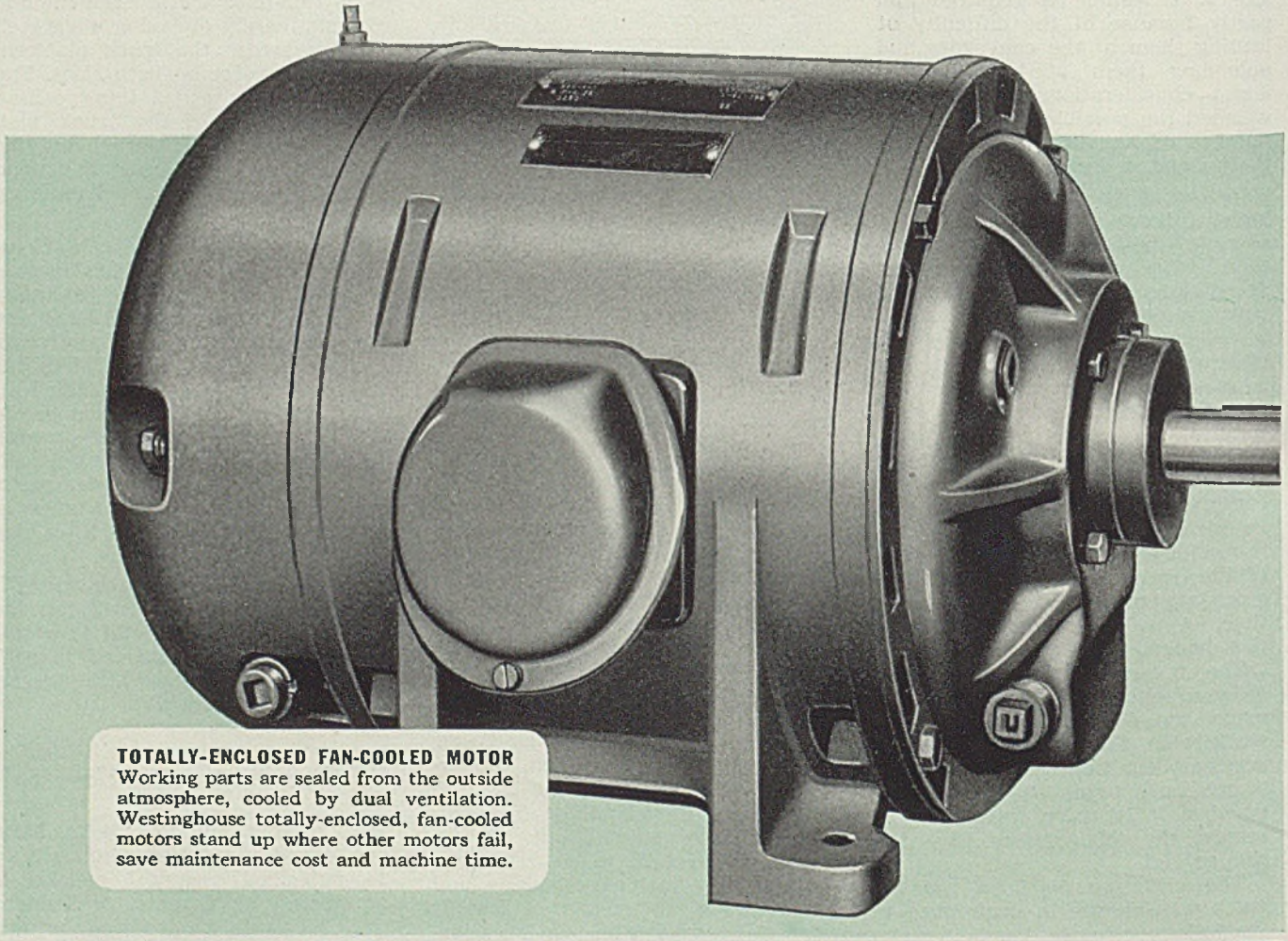
CONQUERS ACID FUMES AND

Protected Against Corrosive Gases . . . Abrasive Dust . . . Metal Chips

Acid can't damage this motor's windings because windings and all other vital parts are safely enclosed and protected from the attacks of external forces. Under a barrage of corrosive gases, abrasive dust, metal chips — conditions that ruin motors designed for normal service—the Westinghouse totally-enclosed, fan-cooled motor delivers trouble-free performance. Rewind expense and production losses are eliminated.

This motor has been specifically designed to meet the requirements of the severe operating conditions often found in metal working shops where chips, falling into the motor, destroy windings. It is particularly suited to those industries where motors operate in heavy, dust laden atmosphere or where corrosive gases or acid might work their way into the working parts.

The totally-enclosed, fan-cooled motor is only one of the many Westinghouse motors that has been designed to meet specific service requirements. There are many others. To be sure of getting low maintenance cost and dependable service consult your Westinghouse representative on all your motor applications.



TOTALLY-ENCLOSED FAN-COOLED MOTOR
Working parts are sealed from the outside atmosphere, cooled by dual ventilation. Westinghouse totally-enclosed, fan-cooled motors stand up where other motors fail, save maintenance cost and machine time.

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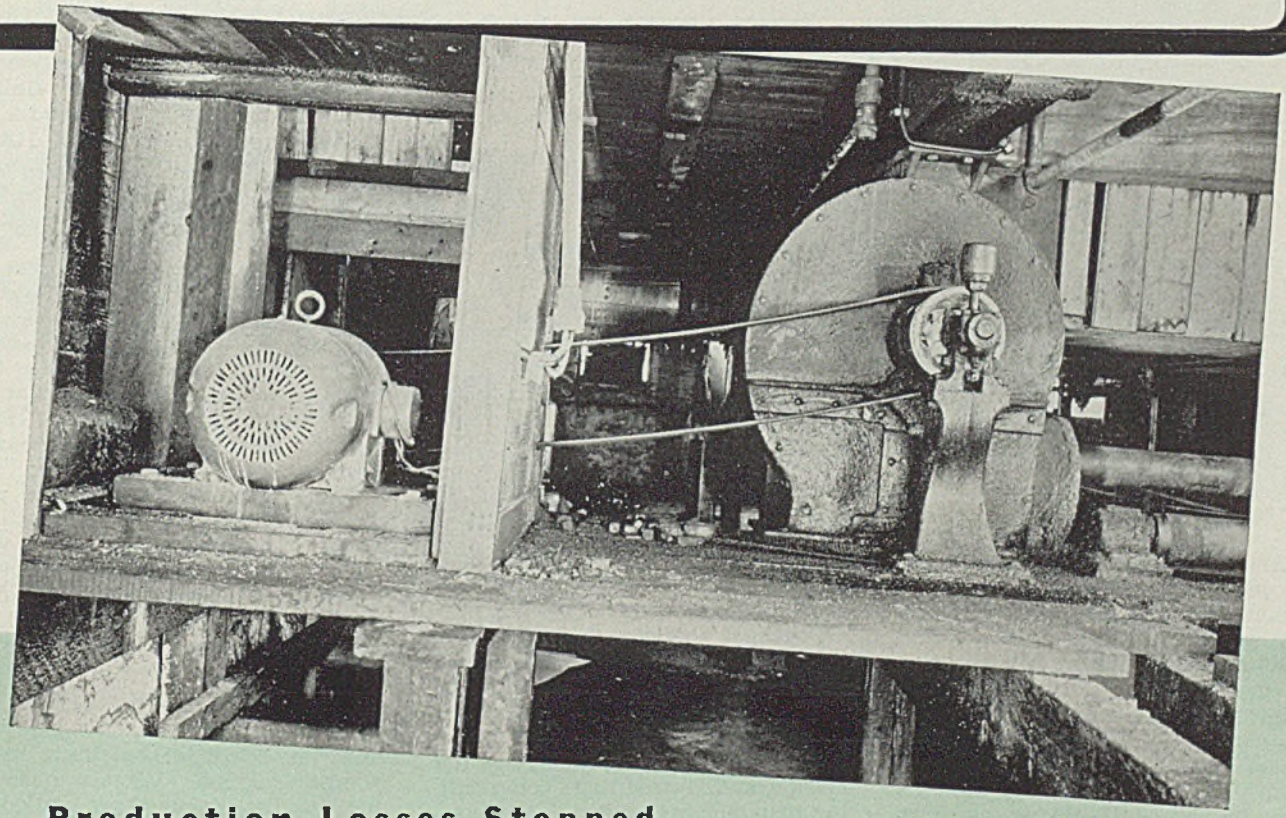
PAYS FOR SELF IN ONE YEAR



Production Losses Stopped
Rewind Expense Eliminated

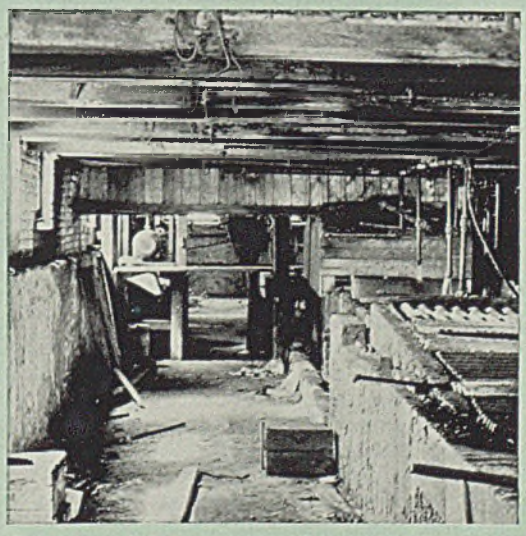
Destructive effects of sulphuric acid fumes on an open motor cost the Newman Crosby Steel Company of Pawtucket, Rhode Island, $840 in six years for motor rewinding alone. In addition there was the expense of maintaining a spare motor on the job at all times and the labor of shifting the regular drive in and out of service each time it had to be rewound.

A year and a half ago the company solved the problem completely by replacing the open motor with a Westinghouse totally-enclosed fan-cooled motor. Since that time not a penny has been spent for rewinding or other motor maintenance. Considering only the cost of rewinds it has saved, the new motor returned its first cost of $140 in one year.

Similar opportunities for savings may exist in your plant. A letter or call to our local office will quickly bring a Westinghouse engineer to help you find them.

WESTINGHOUSE ELECTRIC & MFG. CO.
East Pittsburgh, Pa.

J-21053



Production losses are reduced because the greater reliability of the new Westinghouse drive keeps the steel moving through this pickling liquor tank . . . breakdown of drive would cause spoilage of steel left in tank beyond its normal period.

Motors and Control

The intelligent selection of grinding wheels involves some knowledge of a number of variables such as kind of abrasive, grit, grade, bond. Effective grinding is only done when all these factors are balanced right for the particular job at hand

ABRASIVE WHEELS

are

CUTTING TOOLS

select them with care

By FRED B. JACOBS

■ ANALYTICAL study of the grinding process proves conclusively that action of a properly selected abrasive wheel on metal is not "abrasion" at all. Actually, it is removal of metal in the form of minute chips, accomplished by an almost infinite number of tiny cutting tools which have the unique faculty of eliminating themselves as soon as they become dull—giving place to others with fresh, sharp cutting points and edges.

No production man worthy of that title thinks of choosing a milling cutter for a given job without making sure that it is exactly the type of cutter suited to that particular job.

By the same token, even more careful thought should be given to selection of abrasive wheels, because their effective performance as "cutting tools" depends upon an even greater number of "variables."

The term "abrasive wheel" actually is a misnomer because "to abrade" means "to wear away through friction." Modern grinding wheels definitely do not "abrade." Under proper working conditions, their sharp grains cut the metal away in the form of minute chips. However, the term "abrasive" in connection with grinding wheels has become so well established that doubtless it is destined to endure.

Principal abrasives today are silicon carbide, manufactured alumina, and natural diamonds. Carbide of silicon, made in electric furnaces of resistance type, was the first manufactured abrasive to appear on the market and is used most commonly for grinding materials of comparatively low tensile strength such as cast iron, bronze, etc. Strange as it may seem, it also is excellent for grinding cemented carbide.

The idea that silicon carbide will not grind steel is entirely erroneous as huge quantities of such wheels have been used for cylindrical grinding of steel, especially the softer varieties. Silicon carbide also was for many years an efficient abrasive for saw gumming. Of late years, however, manufactured alumina has replaced silicon carbide for practically all steel grinding operations. Manufactured alumina, Al_2O_3, is made in electric arc furnaces.

Grit Size: The next factor to be considered is the size of the grit or abrasive particles. Grits run from No. 8 to No. 320, in conformity with standards issued by the United States Department of Commerce in the department's bulletin R 118-36. Grit sizes are now so accurately controlled that grit from any one abrasive manufacturer will correspond exactly in size to the grit of the same number made by all other manufacturers. This standardization is exceptionally valuable to grinding wheel users.

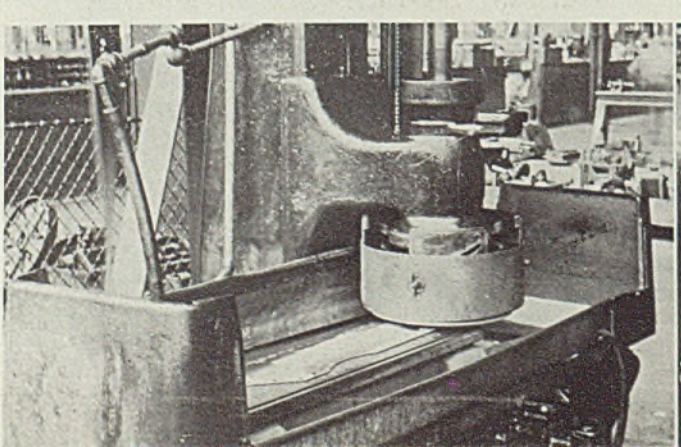
The larger the grit, the faster the wheel will cut. At least that is true within reasonable limits. However, the finish must also be considered.

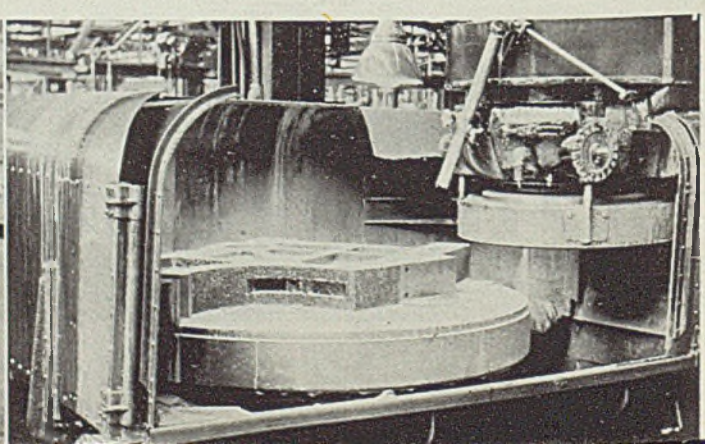
While a coarse grit wheel will "hog off stock" in a satisfactory manner, the chances are that it will leave too rough a finish. However, if the finish appears to be fine enough when viewed by the unaided eye of a person of normal vision, it generally is satisfactory.

Combination Grits: Degree of finish primarily determines the grit. However, there is something more to grit selection. Wheels made of one grit number are called a "straight grit" wheel. In many instances the so called "combination grits" with particles of more than one size are desirable. Various grit combinations have been worked out from a vast amount of data collected through observation of grinding wheel performances under actual working conditions. Combination grit wheels possess the dual advantages of cutting fast and leaving satisfactory finish.

The general rule is: Select a grit which will give a satisfactory finish and at the same time insure adequate production. Grinding wheel manufacturers publish tables setting forth the various grit numbers rec-

Left, a precision surface grinding operation performed on a reciprocating table machine fitted with a magnetic chuck and a cylinder wheel. Right, this machine has a large rotary chuck and a cylinder wheel. Note both wheels have safety guards





DISSTON

famous maker of saws, cuts costs 25% with a PENNSALT CLEANER

By changing to a Pennsalt Cleaner about two years ago, Henry Disston & Sons, Inc., leading manufacturer of saws and other tools, achieved remarkable savings.

The cleaner is used to remove cutting oils from brass fittings for the handles of Disston saws before polishing the brass or nickel-plating. With this Pennsalt Cleaner, Disston saves three ways:

1. **Initial cost of cleaner is about 25% lower.**
2. **Less cleaner is required to handle the same volume of cleaning.**
3. **Labor costs have been reduced. With the previous cleaner, Disston had to use steel balls in the tumbling operation and then sort out the balls from the brass pieces after cleaning. With the Pennsalt Cleaner, no steel balls need be used . . . sorting is eliminated.**

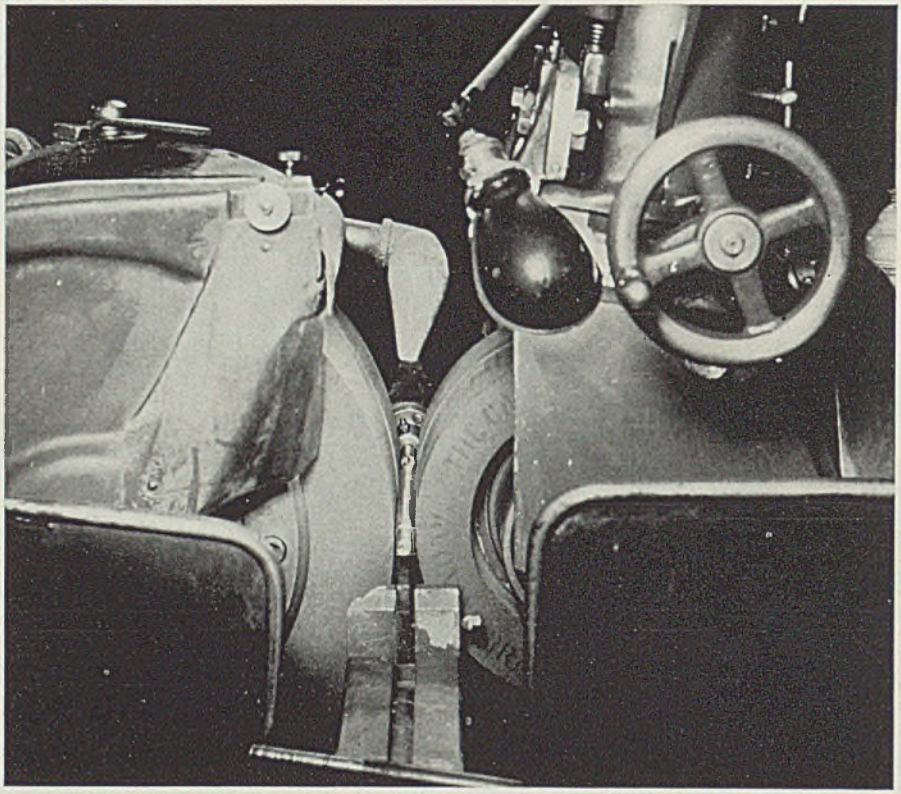
Since cleaning requirements vary from one plant to another, we have many Pennsalt Cleaners . . . each with proved power to make metals "come clean" quickly and economically.

Have you checked your metal cleaning operations lately? If not, we would be glad to have your permission for our serviceman to call on you. If he can't serve you, he will frankly tell you so. Write today to Department E, Pennsalt Cleaner Division, Pennsylvania Salt Manufacturing Co., Widener Bldg., Philadelphia, Pa. Stocks of Pennsalt Cleaners in Boston, Chicago, Hartford, Philadelphia, Pittsburgh, Providence, Springfield, Mass., St. Louis, Wyandotte and Tacoma.

Brass saw fittings cleaned at a saving of 25% with a Pennsalt Cleaner.

PENNSYLVANIA SALT MANUFACTURING COMPANY

Chemicals



Not long ago, centerless grinding was somewhat of a curiosity but today is widely used for finishing many cylindrical parts. Vitrified grinding wheels are generally used while the feed wheels are often bonded in rubber or shellac

ommended for specific kinds of work. What are termed "standard abrasive grain sizes" are:

Coarse	8	10	12	14	16	20	24	30
Medium	36	46	54	60	70	80	90	100
Fine	120	150	180	220	240	280	320	

Wheel Grades: The grade of a grinding wheel is based on wheel *hardness*, and so represents its ability to resist wear. Most grinding wheels are graded by the universal system wherein the earlier letters of the alphabet indicate soft wheels, later letters indicate hard wheels. Thus:

Very soft.....	D	E	F	G
Soft	H	I	J	K
Medium	L	M	N	O
Hard	P	Q	R	S
Very hard	T	U	W	Z

A few grinding wheel manufacturers follow their own grade designations. Thus, wheels made by Carborundum Co. and Safety Grinding Wheel & Machine Co. are graded in the following manner in comparison with the universal grade scale:

Universal										
E	F	G	H	I	J	K	L	M	N	O
P	Q	R	S	T	U	V	W	X	Y	Z
Carborundum										
U	S	R	P	O	N	M	L	K	J	
I	I+	H	H+	G	G+	F	E	D		
Safety										
A	A¼	A½	A¾	M	M¼	M½				
M¾	P	P¼	P½	P¾	I	I¼	I½			
I¾	O	O¼	O½	O¾	N	N½				

In the foregoing tabulation, letters and figures in each row denote corresponding degrees of hardness. It should be noted that Carborundum makes three so-called "degrades," or half grades, namely I+, H+ and G+.

The ideal grade for any grinding wheel, regardless of the material on which it is to be used, would be that bonded just hard enough to insure the grains of abrasive being held so long as they cut effectively, but which would release these grains the momenet they become too dull to cut freely. Such ideal "dull grain releasing action" of course would constantly expose fresh, sharp cutting grains to the work. However, this ideal condition seldom is fully realized in actual practice.

One reason is that many grinding machines—regardless of type—do not embody wheel speed changing devices which will enable the operator to run the wheel at a constant surface speed, regardless of its diameter. Therefore, as a wheel wears away it begins to "act soft." For this reason a general rule has been established which dictates that a wheel when new or comparatively new, should be just hard enough to demand only occasional truing with a diamond or other truing device. It is of course possible to make a grinding wheel so hard that it cuts with undue slowness. On the other hand it can be made so soft that it wears away with undue rapidity without cutting effectively. The "balanced" condition to be sought is to have a wheel just hard enough to stand up to the work and at the same time to cut in an efficient manner.

What Bond? The best possible abrasive would be useless in a grinding wheel if it is incorrectly bonded. The five well established types of bonds in general use are: Vitrified, silicate, shellac, rubber and synthetic resin. Each has its own advantages as well as disadvantages.

Vitrified bond is employed in at least 75 per cent of all grinding wheels in use today. The bond of the so-called vitrified wheel is china clay, called kaolin. This material is mixed with the abrasive and fired in a kiln. A vitrified bond makes a particularly fast cutting wheel, the bond itself having some abrasive quality. Furthermore, through the use of modern kiln equipment and heat control apparatus, it now is possible to duplicate wheel grades under the vitrified process with a degree of exactness impossible only a few years ago.

While the vitrified bond is satisfactory for a great majority of grinding operations, both rough and precision, making vitrified wheels is a slow process. While six weeks used to be required, modern kiln equipment has shortened this somewhat. Further, the vitrified bond is somewhat fragile, so can be fractured rather easily.

Silicate bond is silicate of soda, commonly known as "water glass." In spite of the progress made in perfecting other bonds, silicate bond wheels show high efficiency. They are used extensively in making and regrinding cutlery. Silicate bond wheels also show good efficiency on certain precision grinding. During 1914-18, when it was almost impossible to get satisfactory delivery dates on vitrified wheels, large numbers of silicate wheels were used instead.

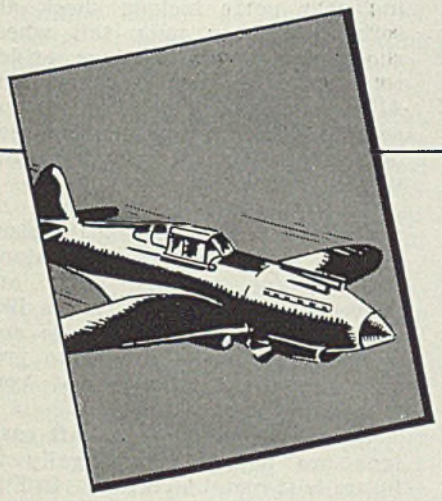
The silicate bonding process requires only a small amount of time. All that is necessary is to mix the silicate with the abrasive, tamp the mixture in a mold—the "raw" wheel then being baked for a short time at moderate heat to solidify the semi-liquid silicate. Thus the chief advantage of the silicate wheel, aside from its good cutting qualities when properly used, is that it can be made quickly. Silicate wheels also can be provided with wire webs to prevent flying apart in case the wheel fractures while running.

One disadvantage of the silicate wheel is that it is not thoroughly waterproof. Thus if a section of the wheel is left standing in water overnight, as may be the case in certain makes of tool grinding machines, the bond will soften or dissolve. Further, silicate wheels on

(*Please turn to Page* 86)

MASTERY OF THE AIR

THROUGH ERIE DEPENDABILITY ON THE GROUND



Light, strong, aluminum forgings are the backbone of the superior American aircraft, being produced in ever increasing numbers for the United States and British air forces. Erie Hammers are playing an important part in setting new production records of aluminum forgings—for practically 100% of the hammers installed in the country's aluminum forge shops are Erie's. The production of Erie Hammers has been stepped-up in order to furnish additional equipment to these plants and other defense industries.

This industry-wide standardization on Erie Hammers speaks well for their *dependability* under abnormally heavy operating schedules—an important characteristic for any forge shop.

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ERIE, PENNSYLVANIA, U.S.A.

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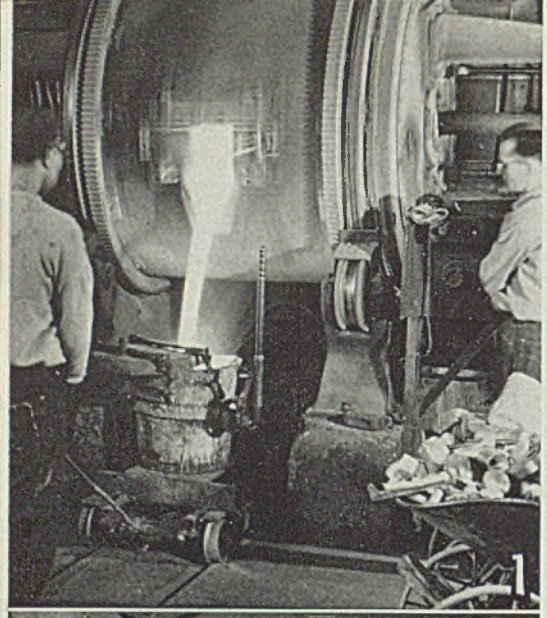
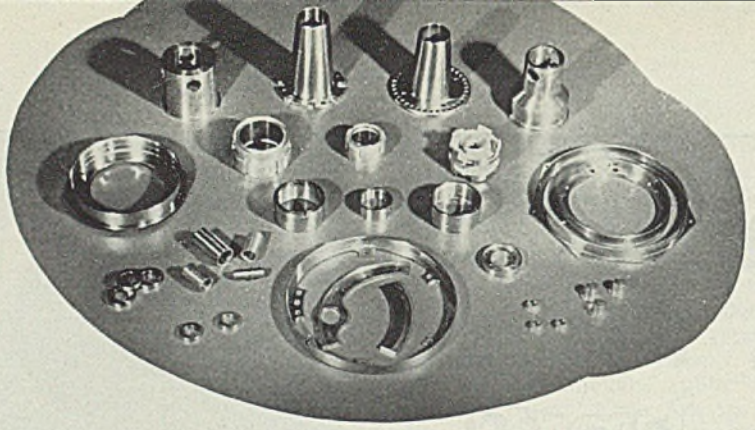
FRANCE Fenwick, S. A. | CANADA John Bertram & Sons Co. Ltd. | ENGLAND Hutton, Griffiths & Co., Ltd.

ERIE

ERIE BUILDS *Dependable* HAMMERS





Special Bronze Aircraft Parts

By J. D. Zaiser
Assistant to General Manager
Ampco Metal Inc.
Milwaukee

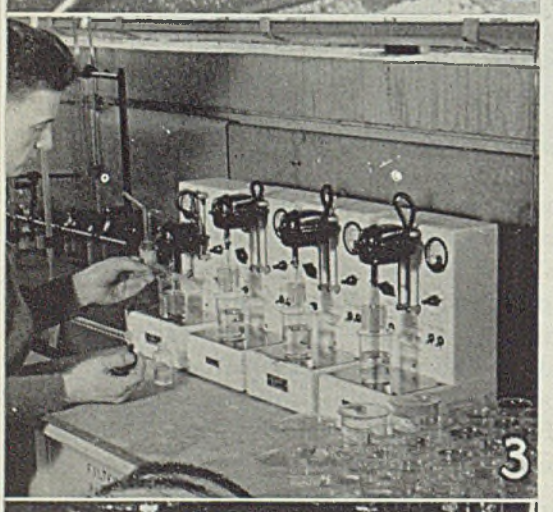
■ ONE OF the earliest forms of subcontracting in connection with the national defense program was that of subletting machine work by the aircraft industry. Ampco Metal Inc., Milwaukee, has for some years been actively engaged in supplying sand and centrifugal castings of special bronzes to several aircraft manufacturers and now regularly supplies some 27 such companies. Acting partly on a well-guided "hunch" and partly on the expressed preference of its customers for a single source for castings and machine work, this company has, within the past four years, built up a complete and modern machine shop division for the precision machining of castings to customers' exact specifications. This machine shop has grown to be as large as the entire plant used to be six or eight years ago.

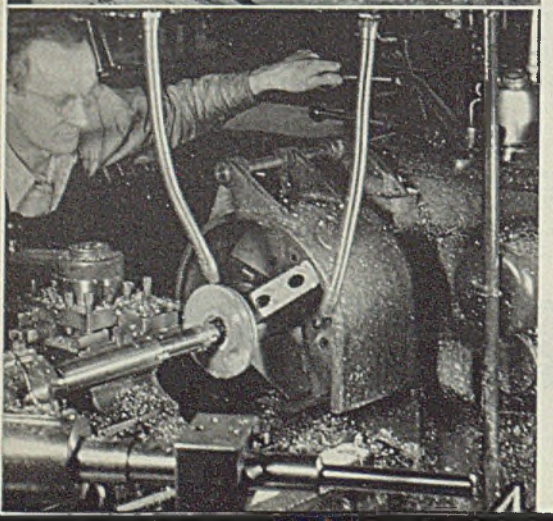
In the meantime, the company's ability to turn out precision parts under exact control all the way from material ingredients to finished pieces has had a favorable reaction on its foundry activity as well and is partly accountable for an expansion program which already has about doubled available foundry floor space.

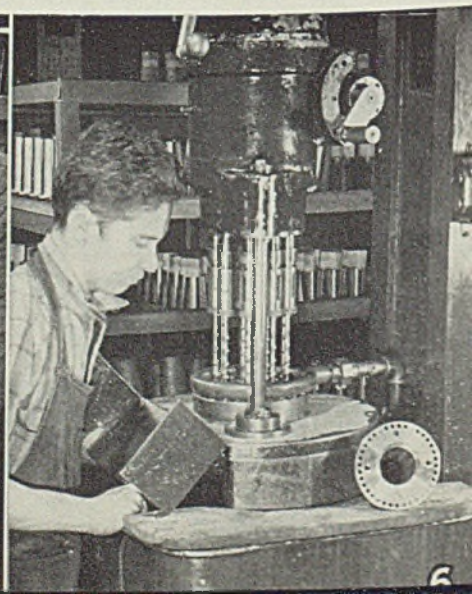
A representative group of parts made at Ampco is shown above. Included are propeller blade bushings, hub attaching nuts and cam rollers. Engine parts include center main bearing liners, cam bearings and cam retainer plates. Landing gear parts include shock absorber retaining nuts, tail wheel shock strut piston bearings, orifice retainers and torque link bushings. All are made of aluminum bronze, several different specific analyses being employed according to the various service requirements.

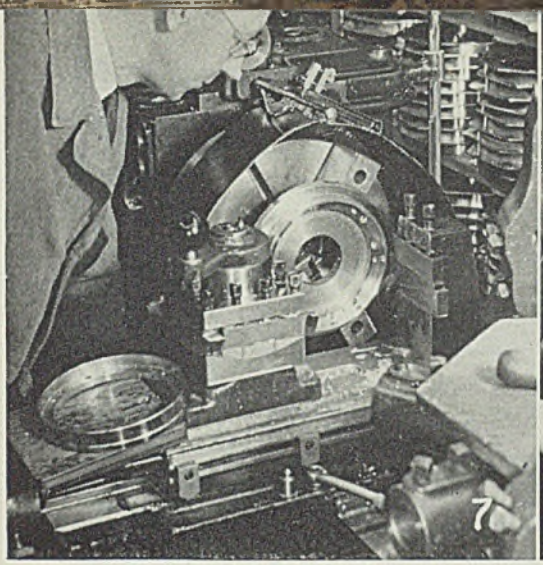
Production of these parts, of course, starts with casting the piece roughly to the shape desired. Many castings for aircraft parts are poured from electric furnaces like that in Fig. 1. Both electric and oil-fired furnaces are used to produce aluminum bronzes of controlled analyses.

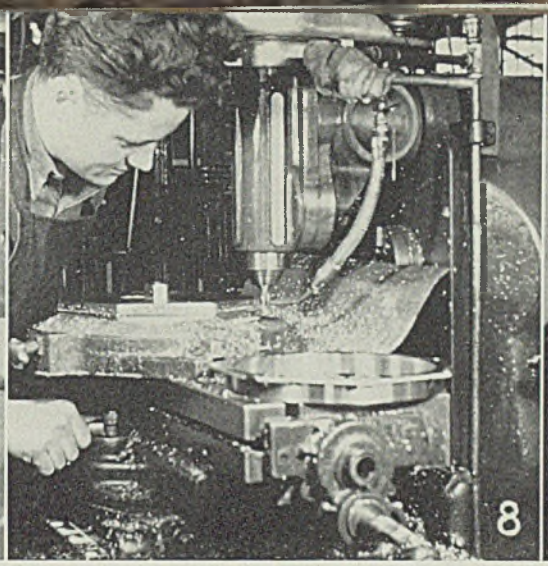
Wherever possible, aircraft castings are poured centrifugally to insure best metal structure. In Fig. 2 a casting is being poured on one of the small production spindles at the Ampco plant, each of which is capable of making castings weigh-

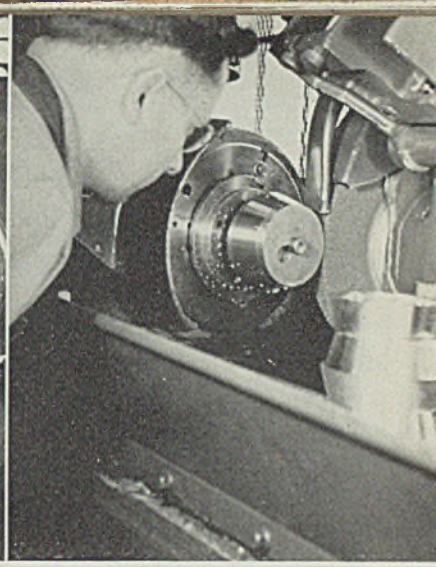












ing from a few pounds to several hundred pounds each, at rotative speeds of from 50 to 3200 revolutions per minute.

Brinell testing is a widely used production check. Test slugs are checked from each heat before pouring, and then after pouring a recheck is taken on castings themselves. A third check is made after partial rough machining. Each heat also must be analyzed to make sure that chemical composition limits are being met. Fig. 3 shows a battery of four electro-analyzers which determine copper content with extreme accuracy, thus eliminating much of the chemist's hand work. Physical properties, too, must be checked for each heat of metal. Use of extensometer equipment aids accurate determination of yield strength. Certifications of chemical composition and physical properties accompany each shipment of parts for aircraft service.

All centrifugal castings must be rough bored to remove the excess metal and the dross from the inside diameter before going on to the more precise finishing operations. Ampco maintains two separate machine shop divisions—one equipped with rugged roughing lathes and mills and the other fitted with high-precision finishing equipment. Fig. 4 shows a portion of the tooling used in rough finishing controllable-pitch propeller blade bushings. Here the bore and face of the bushing flange are rough machined to within about 0.010-inch of finished size.

Bushings for hydromatic full-feathering propellers are being slotted in Fig. 5. Tolerances for this work are extremely low, being on the order of plus 0.001-inch, minus 0.000-inch. Blade bushings for controllable (but not full-feathering) propellers have 36 indexing holes drilled and reamed in four indexings on the 9-spindle Ex-Cell-O drill press in Fig. 6. Here tolerances are lower yet, being in the neighborhood of plus 0.0005-inch, minus 0.0000-inch. An alternate head on this same unit drills and counterbores two drive pin holes and drills and countersinks two attaching holes in one operation.

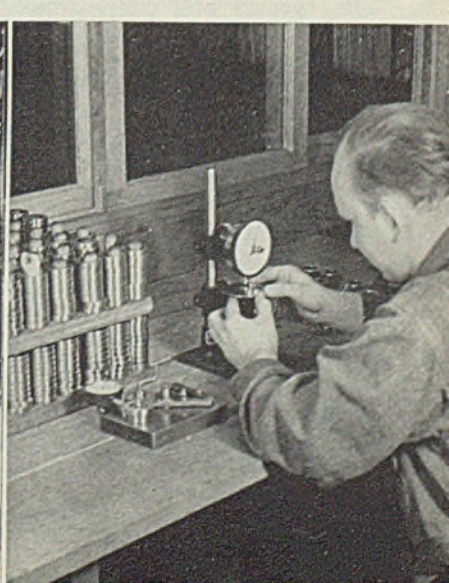
In Fig. 7 internal liners for center main bearings on a well-known radial aircraft engine are being finish turned and bored to a wall thickness tolerance of plus 0.0005-inch, minus 0.0000-inch, on a 7¼-inch diameter in a Gisholt turret lathe. Outside and inside diameters must be held square with the face of the part within 0.002-inch. Tungsten carbide tooling is used exclusively in finishing aircraft parts such as these and others shown.

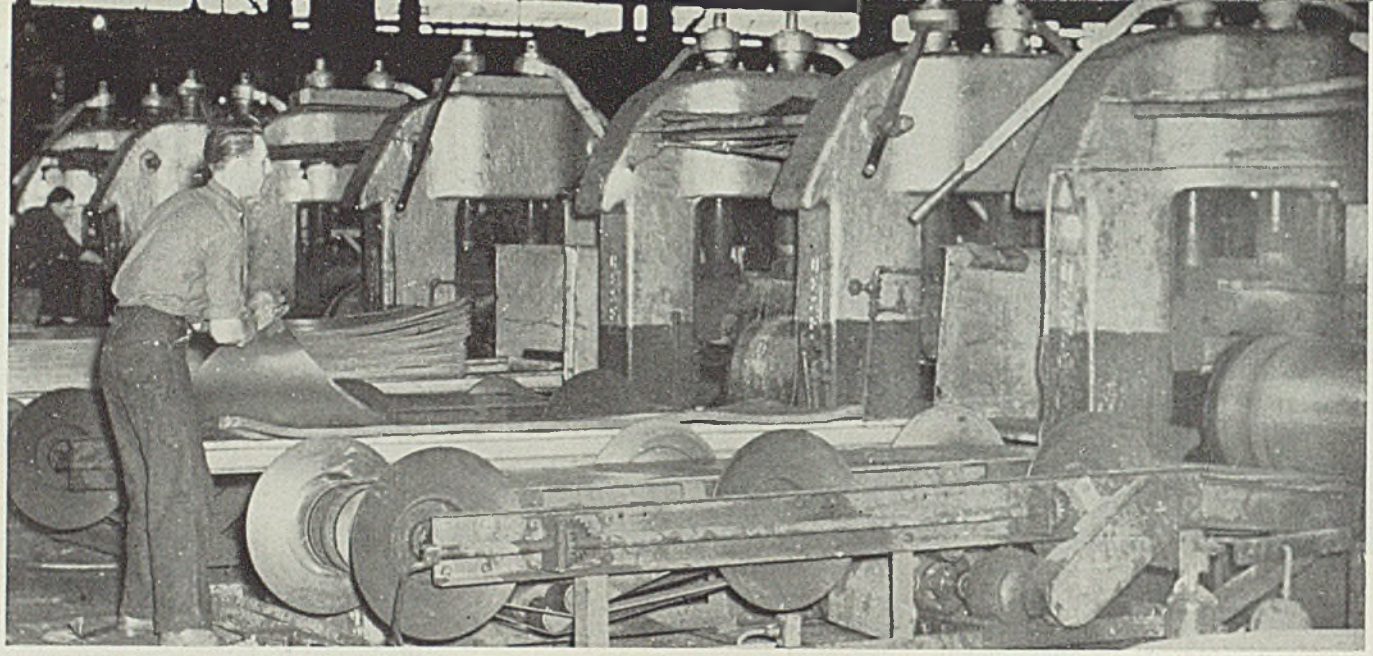
In Fig. 8 an operator is milling one of seven flats on the flanges of a center main bearing liner. In Fig. 9, a rear hub cone which centers the propeller assembly on the motor shaft is having its outside diameter ground. A gage is used to hold angularity of taper within 15 seconds or 1/240th of one degree. The surface must "blue" a minimum of 75 per cent in the gage when testing with blueing fluid.

Inspection is a major factor in the cost of aircraft parts. An inspector in Fig. 10 is checking size and angularity tolerance of blade bushing slots with respect to taper and drive pin holes. For quality control, each propeller bushing is numbered serially and carries a ticket which must be initialed by each operator who works on the part anyplace along the line from rough casting to completed unit. As steel-die marking raises a slight but still objectionable burr on cam rollers, identification numbers are etched on with special acid.

Sensitive and accurate gaging equipment is essential. The fixture at right in Fig. 11 is used to check taper, location and relation of 36 index holes, 2 drive pin holes and 2 attaching holes, each with respect to the others.

Cam roller face-to-face dimension is checked in Fig. 12 by means of indicators graduated to 0.0001-inch. The gaging fixture in the left foreground is used to check concentricity. "Sample" inspection is not sufficient in aircraft work such as this for only 100 per cent inspection will do. Therefore each part leaving the Ampco plant is checked for every dimension.





Cold mills at a Valley plant which are served by adjustable feed tables. Note switch, at right foot of operator, for controlling the operation of the tapered flanged guide rolls and conveyor belts

COLD MILL FEED TABLE

maintains alignment of sheets

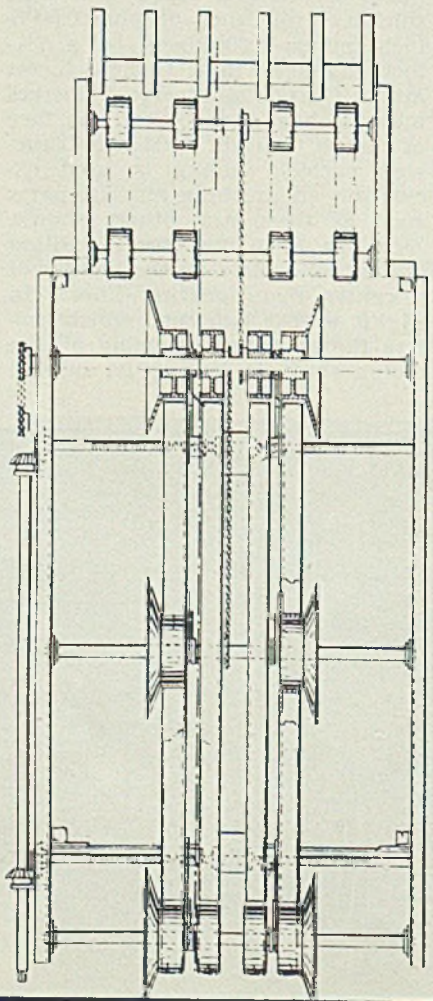
Revolving flanged guide rolls straighten the sheet before it advances toward the cold mill. Table affords reduction of 33-1/3 per cent in total labor cost per unit of rolled material and minimizes the quantity of damaged sheets. Adaptable either to 2 or 4-high cold mills

By JOHN D. KNOX
Steel Plant Editor, STEEL

■ A NEW type semiautomatic rolling mill feed table with adjustable guides and feeders so positioned and actuated that a sheet of any mill width is fed into the gap of the rolls always with its centerline in direct alignment with the centerline of the mill itself, now is serving the 4-high mills of a Mahoning Valley sheetmaker.

This table is designed to feed steel sheets into a cold mill with greater speed and accuracy than heretofore has been possible. At the same time alignment of each sheet is automatically maintained in order to prevent its corners and edges from being turned under or bent in any manner. This automatic alignment device is equally effective with thin or heavy gage sheets.

The adjustable feed table shown in the accompanying illustrations is provided with several revolving tapered flanged guide rolls, so that a sheet laid or dropped between the guide rolls will be carried forward toward the mill and at the same time properly aligned. The revolving guides and the conveyor belts of the table have been mounted in such a way that the entire feed table may be adjusted easily and quickly to any width, thus making it possible to feed various sizes of sheets to the mill with but a minimum of time used in adjusting the feed table to handle the different sized sheets.



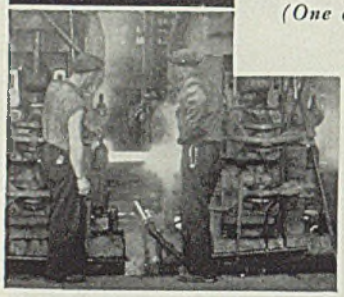
Plan view of adjustable feed table showing various parts of the unit

The feed table is mounted on an elevated floor area immediately adjacent to the cold mill, so that the sheets may be conveniently and quickly placed thereon by the operator. After the sheet is laid on the table without special care as to position, it is automatically straightened out and fed into the mill rolls squarely without further attention or possibility of damage.

The first feed table of this type was installed as an auxiliary to a 4-stand cold roll sheet mill in 1937. A six month trial period having demonstrated the effectiveness of this new unit, more of the tables were installed by the same company. This table not only eliminates one man from the crew operating the cold mill, but it increases the speed with which material can be fed through the mill. Consequently, the total labor cost per unit of rolled material is decreased more than one-third. Mill shutdowns for the purpose of polishing of rolls damaged by bent cornered sheets are also practically eliminated. The operating cost of the feed table is negligible, and the maintenance on those tables which have been in constant use has been confined to occasional shortening or replacement

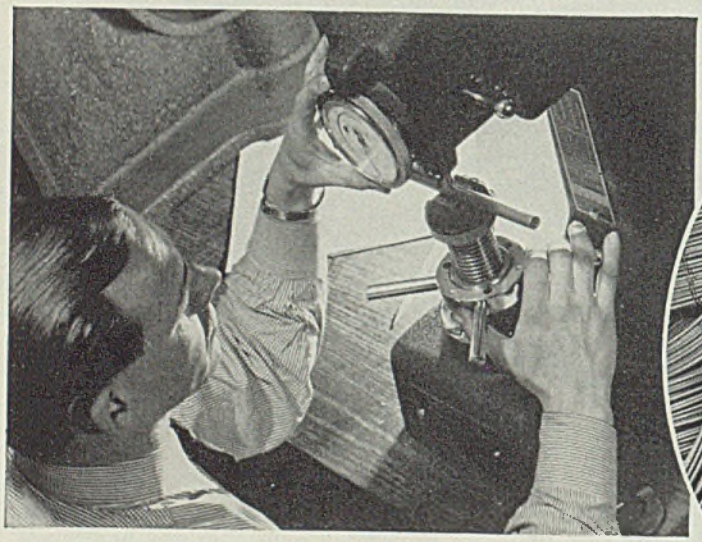
IT TAKES "*knowing how*" TO MAKE GOOD WIRE

(One of a series of advertisements illustrating the importance of quality control in the manufacture of American Quality Wires.)

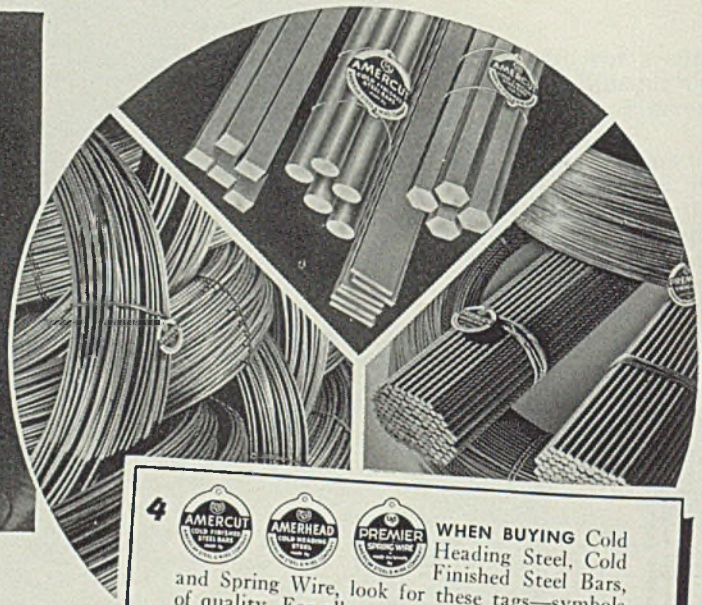


1 **FROM EACH** of the basic steps in its manufacture, American Quality Wire emerges perfectly prepared for the next operation. Each further processing of the wire is designed to meet a particular requirement—and the finished wire, off the last machine, is as perfect for its purpose as modern machinery and modern technology can make it.

2 **"KNOWING HOW"** does not end with the manufacture of our wire products. Our technical contact men are particularly trained to work with you on your wire problems. Our Metallurgical Research, Development and Control Engineers, backed by their laboratory technicians, are always at the service of our customers.



3 **THE PRACTICES SO CAREFULLY ESTABLISHED** by the Technical Staff are closely followed and checked by competent testers and inspectors, so that each carload of wire you receive will give the same satisfactory performance on each job.



4 **WHEN BUYING** Cold Heading Steel, Cold Finished Steel Bars, and Spring Wire, look for these tags—symbols of quality. For all your requirements in Manufacturers Wires, look to American Steel & Wire Company—Wire Makers to the Nation.

AMERICAN STEEL & WIRE COMPANY

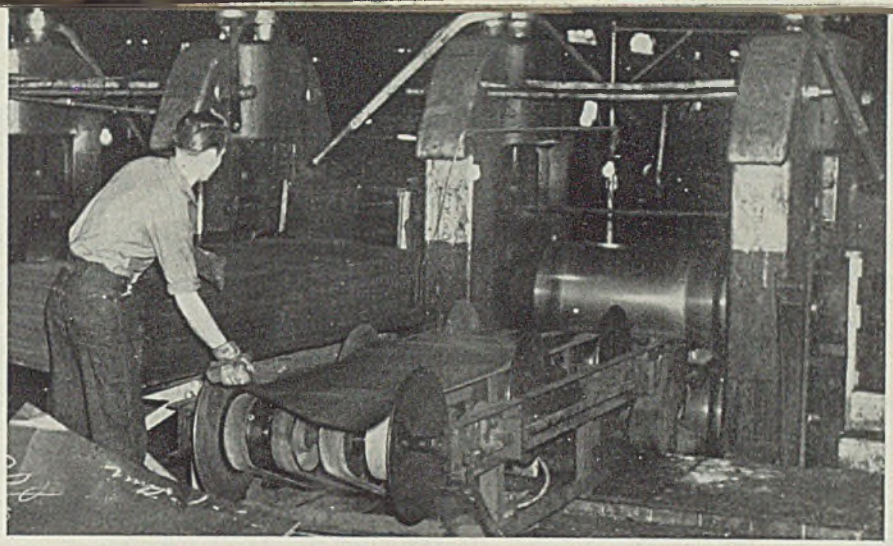
Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

United States Steel Export Company, New York

AMERICAN *Quality* WIRES FOR MANUFACTURING PURPOSES

UNITED STATES STEEL



Sheet on feed table is ready to be conveyed into the gap of the rolls. Flanged rolls maintain the alignment of the sheet while in transit

of the conveyor belting employed.

American, British, and Canadian patents covering the new feed table have been granted to its inventors, William Newby and Adolph F. Frazier of Youngstown and Port Clinton, O., respectively. Arrangements for manufacturing the tables have been made with a leading producer of industrial machinery.

AGEING

Tools and Gages

By W. P. BOYLE
Lindberg Engineering Co.
223 North Laflin Street
Chicago

■ THE HUGE volume of work for defense production has increased the demand for tools and gages for comparison and inspection operations. Also, it has aroused considerable interest in methods of stabilizing such parts by means of accelerated ageing methods.

Of course it is not possible to treat a piece of steel so it will not expand or contract with temperature changes. The ageing process referred to merely stabilizes the structure of the metal so no further changes in structure will take place after the gage is ground to final dimensions and put in service. The ageing process sees to it that a gage finish ground to a given size and a given temperature will always be that size at that temperature.

It is well known that a piece of steel that is given sufficient time will usually stabilize itself, although this may require several weeks or months under some conditions. Thus, methods to accelerate ageing were devised long ago. One of the older methods is to suspend the steel so it may move freely and then strike it a sharp blow.

One of the most common methods is as follows: After the gages have been hardened and tempered at about 350 degrees Fahr. for the desired length of time, they are usually ground within a few thousandths of the required tolerance. In some cases the grinding is not done until after the ageing treatment. If much material is to be ground off, it is always best to use a light final grind after ageing.

Dry Ice Treatment: To age the gages, they are heated to about 300 degrees Fahr. in a tempering furnace and then allowed to cool to room temperature. When at room temperature they are packed in dry ice which will cool them to 105 degrees Fahr. below zero. This cycle is repeated four or five times, allowing the gage to come to room temperature each time between the dry ice treatment and the furnace treatment.

Of course the length of time which parts are exposed to the dry ice depends upon the thickness of the sections involved. Four to five hours appears satisfactory for medium sized parts. The dry ice is packed directly around the parts as uniformly as possible, the whole being kept in a well insulated container, preferably constructed with 10 to 12 inches of cork all around.

High-Carbon High-Chromium Method: Under some conditions, a better method of securing stabilized gages is to use high-carbon high-chromium air-hardening steel of about 1.50 per cent carbon and 12.5 per cent chromium. After hardening, the steel is tempered at 1000 degrees Fahr. to obtain the secondary hardness of 61 to 62 rockwell C. This high-temperature draw completely stabilizes the steel.

A typical procedure in handling such work is to rough machine the parts, strain relieve at 1200 degrees Fahr., finish machine, harden at 1850 to 1875 degrees Fahr., air cool, draw at 1000 degrees Fahr., rough grind, draw at 350 degrees Fahr. to remove any grinding strain and finish grind to exact size.

With this alloy and procedure, the user obtains the important advantage that the parts will not change shape on hardening nor in the draw. Further, the wear resistance of the material is extremely high. While this steel is more expensive and somewhat more difficult to machine than the more common tool steels, these advantages often are more than offset by the simplicity of the stabilizing treatment and the wearability of the gage in service plus the freedom from shape change in hardening.

Tested Methods for Training Workers

■ *Training Workers and Supervisors*, by Charles Reitell; fabrikoid, 182 pages, 5½ x 8 inches; published by Ronald Press Co., New York, for $1.50.

This is a practical book on selecting and training workers. The author claims its principles and methods will work since they have been shaped from specific experiences and problems solved in many plants. The text shows what has been accomplished by many companies in meeting successfully their needs for an expanded labor force of high quality and a competent supervising force.

Part I is devoted to principles and methods for selecting employes, with specific treatment of job ratings, use of application forms and procedures, tests and techniques of interviewing. Part II offers specific methods of training, how to take advantage of the two secrets of training success, building of correct habits in performance of operations and tested techniques of good teaching.

Part III is concerned with training that builds good standard performance, in quality and quantity production. The role of standards and their specific application to costs, quality and quantity and to planned operations, is discussed in detail. Part IV, human relations, is of prime importance. Here are presented underlying factors in the relationships of management and labor.

How the Navy Makes Large Valves by WELDING Rolled and Forged Parts Together

■ VALVES made by welding together rolled and forged steel parts are being used extensively by the Navy in its large shipbuilding program. These include angle, globe and gate valves ranging in size from 2 to 18 inches, the majority being in the 2 to 8-inch range. Each of the big battleships now under construction require 300 or more of these.

Lieut. Commander W. B. Holden, assistant design superintendent at the United States Navy Yard, Brooklyn, N. Y., is responsible for the development of these valves and their method of fabrication. The first ones were made at the Brooklyn yard, where the manufacturing procedure was perfected, but subsequently a large part of the work has been turned over to private fabricators for production to the Navy's design. A design similar to that discussed here has been perfected at the United States Navy Yard in Philadelphia.

The valves now are employed in steam and oil lines at pressures up to 150 pounds and temperatures up to 650 degrees Fahr. Valves for higher pressures and temperatures are under development. More than 125 welded manifold assemblies also are used on each of the larger ships while the building of numerous smaller warships also could involve proportionately large quantities of valves. At present no ships other than Navy yard constructed battleships use the valves described here.

The design is the answer to a problem which confronted the Navy in developing steel valves to meet some rather peculiar specifications. The first factor is weight. Although the Navy specifications and standards provided for various pressure ranges in valves, no standard was available for 150 pounds, and such a standard was needed.

Nearest existing standards were 300 pounds with modified lighter flanges, or the 100-pound standard (brass) modified to steel. A 5-inch angle valve made of cast steel to either standard would weigh approximately 200 pounds, compared with 92 pounds for the welded valve of similar size. This wide variation in weight is traceable directly to the difficulty of casting thin walls of assured soundness. Wall thickness of cast valve bodies is determined by limitations of foundry practice and generally involves a greater thickness than that required for strength or rigidity. Since weight is a vital consideration in naval craft, reductions of as much as 50 per cent—made possible by the welded design—are important.

The second factor involves soundness, also an old foundry problem. Navy engineers point out that the soundness of rolled material is close to 100 per cent. Flaws in castings cause difficulty—especially if they do not show up until near the final machining operation when it may be too late to save the casting. Rejections from faulty material are said to be negligible in the case of the welded valve. Too, production is speeded because comparatively little machining is required. Also, extra outlets may be added to the valve where desired merely by cutting an opening and attaching a flanged nipple by welding.

The third factor in adopting this design was flexibility of arrangement for manifolds. In many cases, only one or two manifolds of a kind are required. Ordinarily this would involve a special pattern and development of a particular casting technique for each, whereas fabricating the manifolds by welding is merely a matter of cutting and arranging standard parts to suit each case. Body of an 8-inch angle valve (or gate valve either) is ¼-inch thick.

The fourth factor, local in character, was the absence of steel foundries at some Navy yards. However, all yards are equipped to cut, bend, forge and weld rolled steel and so are able to fabricate these new valves.

From the standpoint of cost, the welded valve shows no important advantage over other types, except in the larger sizes. Cost of sizes from 2 to 8 inches averages about the same for both welded and cast valves. Weight saving inherent in the welded valve could be increased further except for the necessity of using sufficiently thick sections to maintain rigidity of the assembly during machining and for keeping distortion under pressure down to

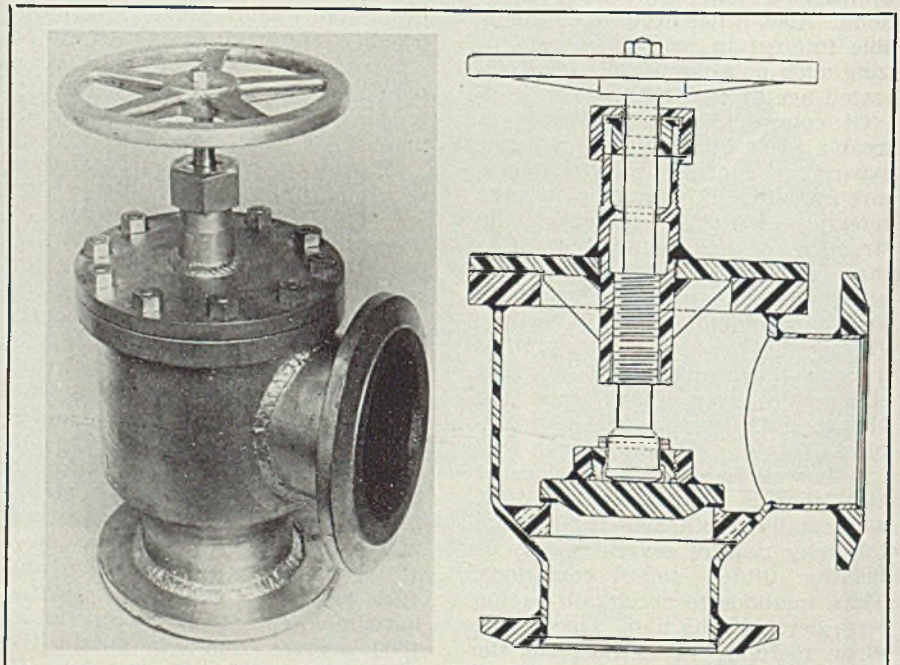
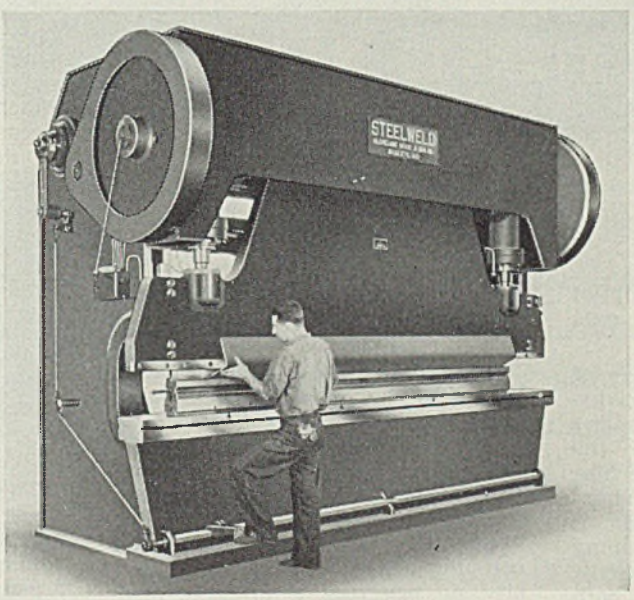


Fig. 1—Left, appearance of a 5-inch globe valve made according to the welded design shown diagrammatically in Fig. 2, the cross section sketch at right

STEELWELD *Bending Presses*



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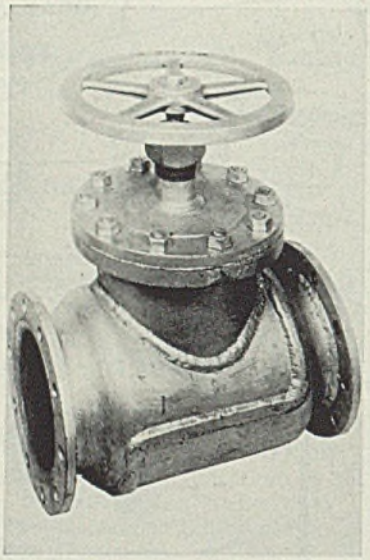


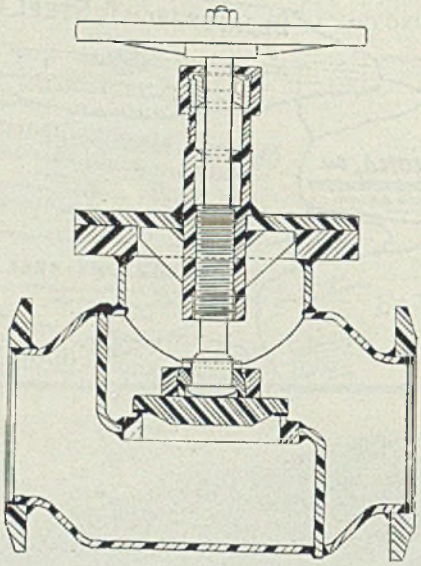


Fig. 3—The 5-inch all-welded globe valve shown at left is designed along similar lines. For details, see cross section sketch, Fig. 4, at right

a satisfactory minimum. Body of an 8-inch angle valve (or gate valve either) is ¼-inch thick.

In fabricating an angle valve of the type shown in the accompanying sketch, a piece of seamless steel tubing which comprises the body is swaged at one end. The flat valve seat ring, made of stainless steel, is welded in position at the necked section of the tubing in the lower part of the body. Flanges then are welded to both ends of the body. The top flange is a simple ring cut from a steel plate. Another flange, similar to the forged flange welded to the bottom of the body, is welded to the right-angle nozzle. The latter is a short piece of seamless steel tubing welded to an opening cut in the side of the body.

After the body has been assembled it is stress relieved by heating in a furnace to approximately 1150 degrees Fahr. After being maintained for one hour at this temperature, it is cooled slowly in the furnace to below 500 degrees. The body then is ready for machining.

Like the valve seat, the disk also is erosion resistant. It is made from low-carbon steel plate, but the area which comes in contact with the seat has a deposited facing of Stellite. A boss welded to the top of the disk is threaded to take a nut which affixes the disk to the valve stem.

Welding also is used to build up the bonnet assembly. The bonnet itself, consisting of a steel sleeve, is inserted into a flange cut from steel plate and welded in place. As additional support, four ribs are welded to the bonnet and flange. The valve stem is threaded into the bonnet, and the latter is topped by a gland and retaining nut. A cast aluminum alloy is employed for the handwheel, the only casting in the valve. Bolts join the bonnet and body assemblies together to form the completed valve.

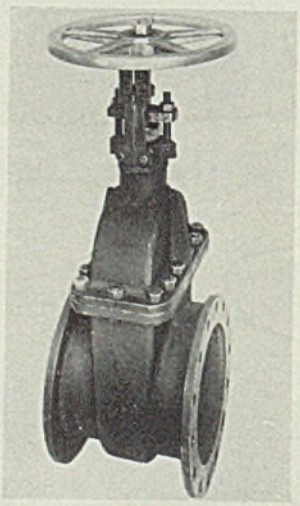
Making a globe valve, also illustrated, involves the same general principles as in fabricating the angle valve but is somewhat more complicated because of the necessity of inserting a division plate which holds the seat. Tubing used for the body is swaged at both ends and an opening cut for the bonnet nozzle. It is then cut into two irregularly shaped pieces to receive the division plate which is welded in place, together with the stainless steel valve seat. The two body sections finally are rejoined and the nozzle and flanges are attached.

In testing the valves hydrostatically, each is submitted to a pressure of 225 pounds per square inch for steam and hydraulic service and 300 pounds for fuel oil service. They are also tested at 150 pounds for tightness on the seat in both directions, with the valve closed by hand. Following the hydrostatic test, the valves are tested by air pressure at about 100 pounds for porosity and tightness on the seat.

The gate valve illustrated has stirred more interest in the valve industry than the globe or angle valve. In manufacturing the gate valve, a flanged box is constructed which consists of two face plates and a wrapper plate to which is attached the bonnet flange. Short pieces of tubing, suitably angled on the inner end, are inserted in holes in the face plates and the end flange is welded on. The end of the tubing protruding into the box which forms the body is then hard-faced with electrically deposited corrosion-resisting steel. Guide ribs are secured inside the body by plug or slot welding from the outside; the body is then ready for stress-relieving and machining in the same manner as described above for globe and angle valves.

The wedge of the gate valve is made up of a ring forged in halves and welded together with suitable tubing, plate and machine stock, assembled as shown. The wedge is hard-faced with Stellite.

Experimental gate valves up to 38 inches in diameter, both of steel and monel, have been constructed by one progressive valve manufacturer with remarkable results as to rigidity and weight, with a slight saving in cost over the conventional cast bronze valve.



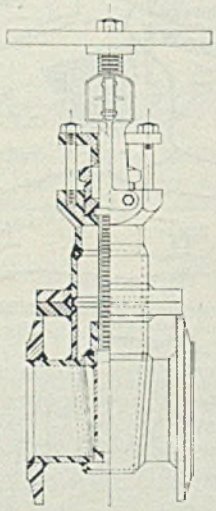
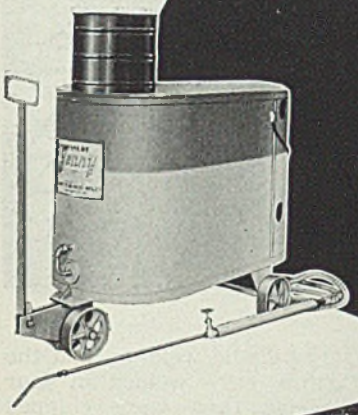


Fig. 5 (Left)—This 8-inch gate valve is one of the most interesting all-welded designs. Fig. 6 (Right)—Gives details in a cross section view



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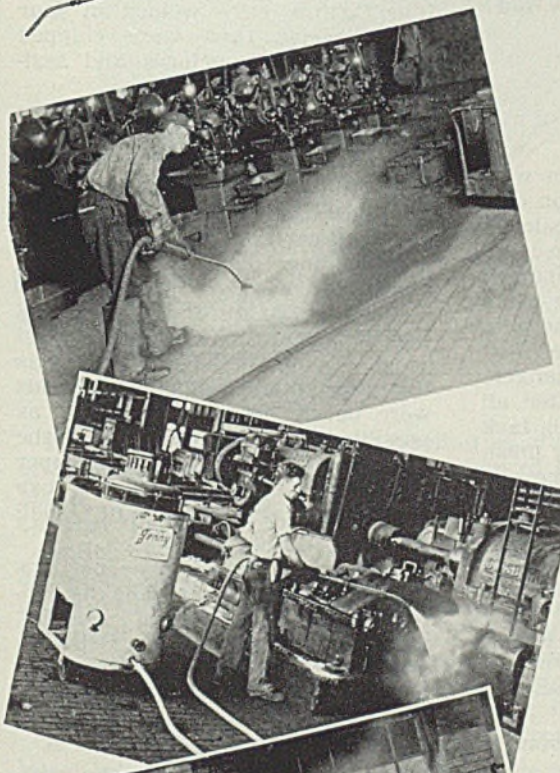

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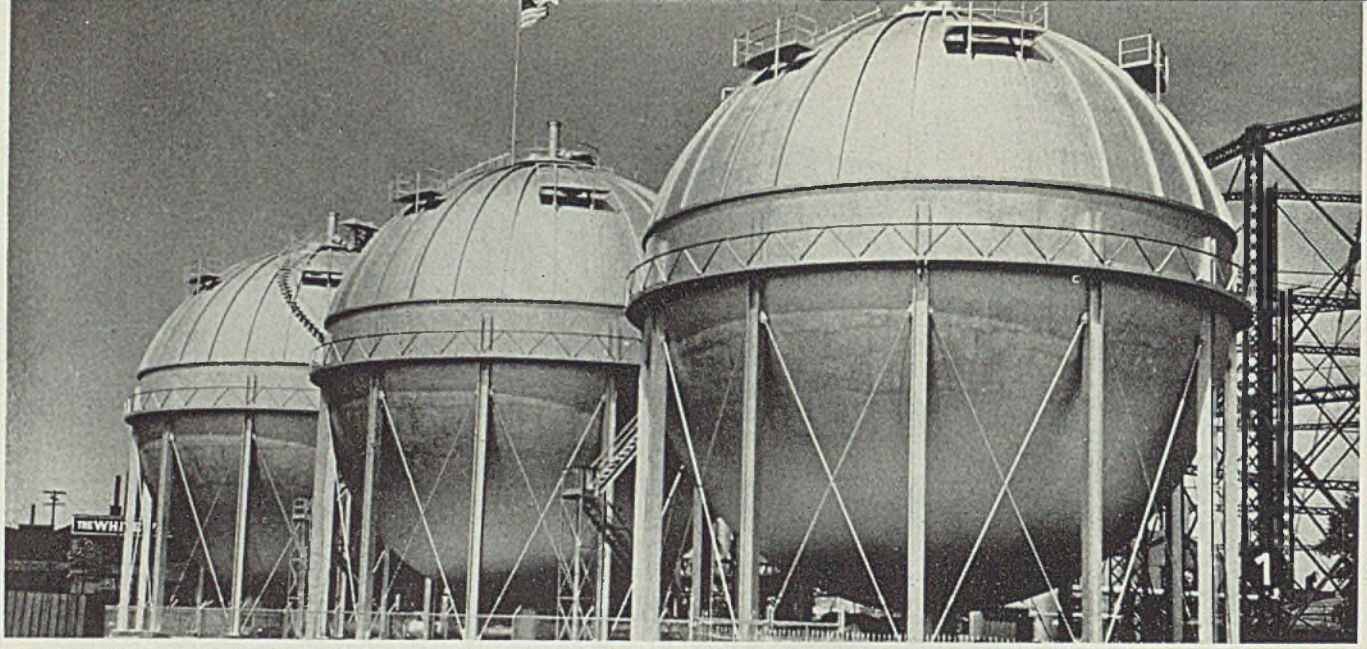


WELDED GAS STORAGE UNIT

Has Capacity of 50 Conventional Holders

■ A NEW million-dollar gas storage project, which provides, in three spherical tanks, a storage capacity equivalent to 150 conventional gas holders, was recently made practicable by arc welded construction at the plant of a Mid-west gas company. As shown in Fig. 1, each of these storage tanks measures 57 feet in diameter, reaching up into the air some 70 feet. In reality, each sphere is two spheres in one. Within an outer shell and separated from it by 3 feet of cork insulation is a nickel alloy steel sphere in which the 50,000,000 cubic feet of gas is stored. This inner sphere actually "floats" upon cork insulation.

Each sphere is supported by 12 columns fabricated of wide-flange steel sections cut at the top to conform to the contour of the shell and connected to it by fillet welds. One hundred and twenty-eight separately formed segments make up the shell of each sphere. These were fabricated of 7/16-inch steel plate and pressed to the proper curvature.

Erection of a sphere began with first placing the columns upon concrete footings, erecting the balcony and platform, then the center cylindrical section, utilizing temporary bolted connections. Working down from this center section, the segments of the sphere were next placed, utilizing clip angle hangers to hold them in place. After all steel of a tier was in position, tack welds were made, followed by finish welding of inside seams. The clip angles were chipped away at an early stage in the welding, and the inner seams were welded in four beads. Welds then were chipped away on outer surfaces and seal-welded.

With the lower half of the outer shell completed, cork insulation was incorporated. Then followed application of asbestos paper, a nickel steel backing up strip for the welds on the inner sphere, finishing with arc welding on the inner shell seams.

The lower half of the inner sphere, which is entirely of nickel steel ⅜-inch and 7/16-inch thick, was then erected and welded. All welds were beveled to as small a V as possible. With completion of the two lower halves, first the upper half of the inner sphere and then the upper half of the outer shell was placed and welded.

Erection of these upper portions consisted of working from the center cylindrical section upward, placing each tier of segments in order. This work was carried out utilizing the same temporary bolted clip angles until all steel was in position.

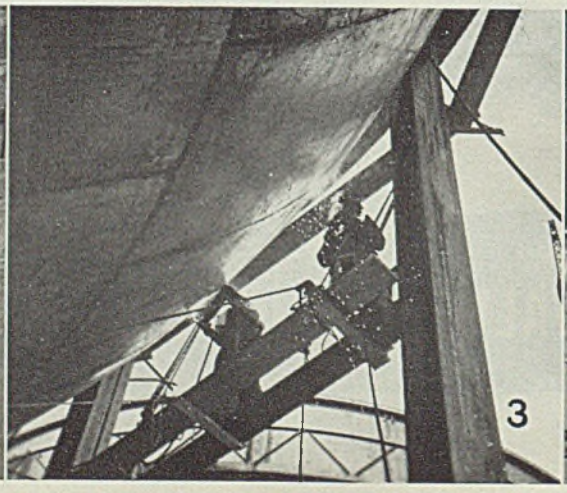
General contractor for the project was Gas Machinery Co., Cleveland. Pittsburgh-Des Moines Steel Co., Neville Island, Pa., was the subcontractor for the fabrication and erection.

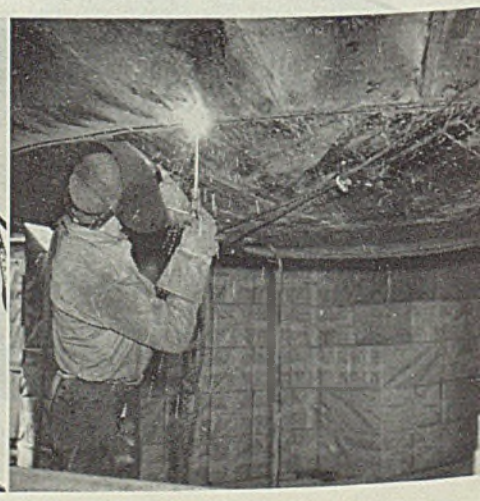
Fig. 1 — Three completed arc-welded gas storage spheres, each having a capacity of 50,000,000 cubic feet of gas. All photos, courtesy Lincoln Electric Co., Cleveland

Fig. 2—Arc welding a clip angle to inside of outer shell for holding scaffolding for welders

Fig. 3—Seal welding by the electric-arc process outer shell of sphere, following completion of inner seam welding

Fig. 4—Overhead welding of bottom segment of outer shell of sphere





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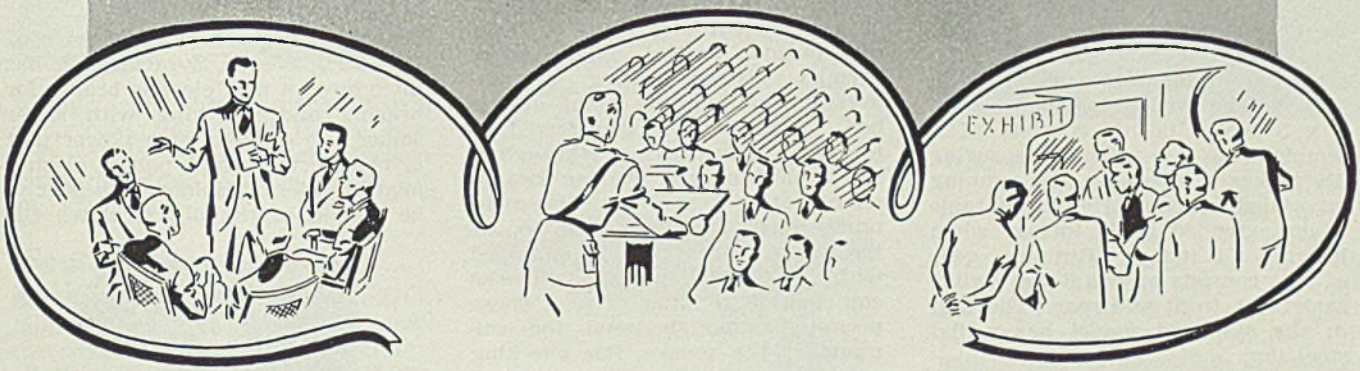

The entire metal industry is pooling its knowledge of defense production and conservation at the 1941 Metal Congress & Exposition in Philadelphia, October 20-24.

Under direct request of many manufacturers a comprehensive program of group meetings on Defense Problems, Conservation and Substitution has been prepared. These group meetings are not to be of the ordinary round-table type where everything is left to chance but are to be well-planned presentations.

A representative will present at each meeting the latest information on the scarce materials involved in the clinic and the status of substitute materials, also indicating how industry can assist in and adjust itself to the present shortages. Since meetings will be "off-the-record" men of industry will be free to discuss actual production problems and quote examples.

Subjects to be discussed include alloy steels, stainless, molybdenum, tool steels . . . alloy castings . . . bearing metals . . . shells . . . aluminum . . . magnesium . . . copper . . . inspection of metals . . . priorities, etc.

In addition to these afternoon and evening clinic meetings, more than 80 technical papers will be presented at regular annual meetings of the four technical societies who cooperate in the Metal Congress.

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OCT. 20-24

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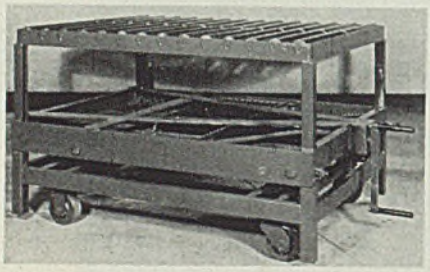
Industrial

Lift Table

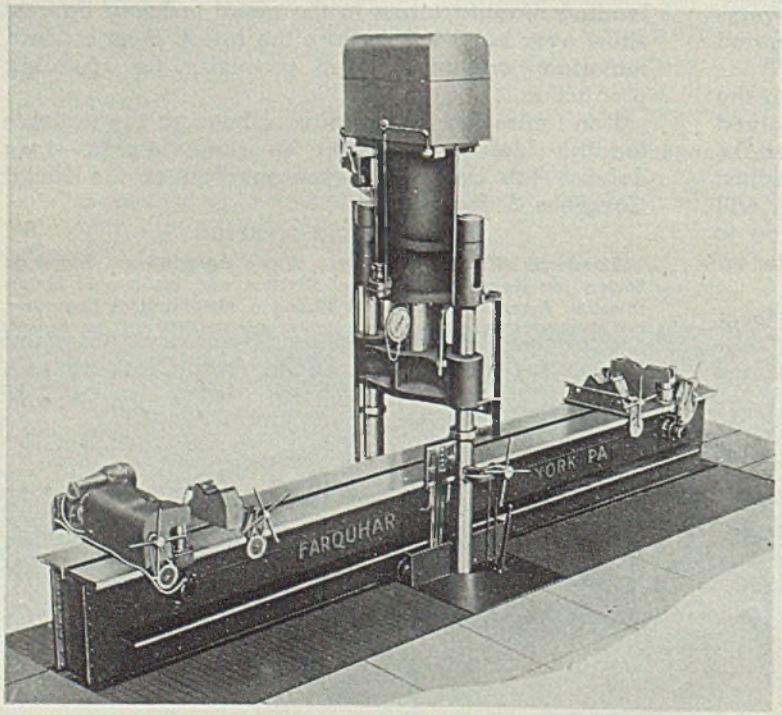
■ Service Caster & Truck Co., 640 North Brownswood avenue, Albion, Mich., announces a new Liftable with a capacity of 5000 pounds. Originally designed to handle dies, it can be used as a feeding table for press work or for handling storage batteries from the electric mule to charging rack. Constructed of arc welded steel, the table is raised and lowered by a vise-type handle. Lifting mechanism consists of a



steel screw which actuates the lifting chains. A cam lock serves to lock the table at any working height. The model shown measures 4 x 5 feet. Its top consists of a double row of rollers measuring 2½ inches in diameter and running on sealed bearing. Height of table when extended is 36 inches, when lowered 24 inches. Running gear of unit consists of two 6-inch swivel casters at front and rear. The unit in the standard model has a flat steel top.

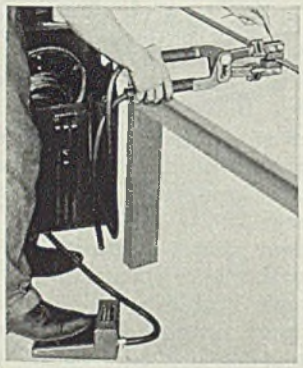
Gun and Shaft Straightening Press

■ A. B. Farquhar Co. Ltd., Hydraulic Press division, York, Pa., has introduced a 500-ton self-contained hydraulic straightening press for straightening large gun barrels and heavy shafting. Its bed is of heavy steel sections with the top surface machined for guiding various auxiliary units of the machine. The main pressing unit of the press is of 500-ton capacity, and is supported by wheels on the machine bed. The traverse mechanism of the pressing unit consists of a motorized unit actuated by a push-button control. The latter permits precise setting of the pressing unit at any point of the bed. The power is transferred to the bed of the machine through a set of shafting and gearing located underneath the machine. The main pump unit and drive are on top of the press. Press bed is equipped with solid V pressure blocks equipped with hand drive. These permit passage between the columns of the press. For checking operations, the press is equipped with two roller stands. One set of rollers is driven by a motorized unit. The hydraulic lifting mechanism of both roller stands is actuated from a push-button station. Also, adjustment to permit variation in the amount of lift of each roller stand, independently of each other, is provided. Main press unit has two speeds, fast approach speed and slow pressure speed. Speed change is accomplished automatically. Both sides of the machine are provided with an automatic pit covering device.



Brazing Unit

■ Ideal Commutator Dresser Co., 5076 Park avenue, Syracuse, Ill., has introduced a new electric brazer for brazing and soldering with silver solder. It consists of a power unit or transformer and a pair of electric heating pliers. Holding the part to be brazed in the pliers, closes the



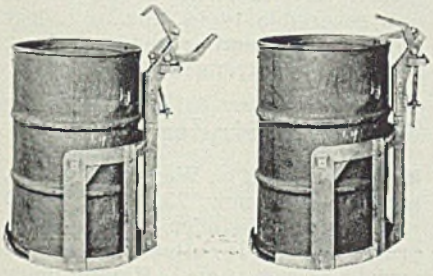
secondary circuit causing the part to heat quickly to brazing temperature. Heat is controlled by "on-off" foot switch. The brazer is compact, portable, easy to use. When in use the cover turns back providing a convenient shelf for flux and silver solder. Compartments are provided for heating pliers, foot switch, silver solder and flux. When not in use all parts can be enclosed in the cabinet. The unit operates on 230 volt, 50-60 cycle power supply. Its rating is 7½ kilovolt amperes. The heating pliers have a 6¼-inch throat. Face of carbon is 1¾ x 2 inches but may be filed to shape.

Dumping Harness

■ Lewis-Shepard Sales Corp., 245 Walnut street, Watertown, Mass., has placed on the market a new quick-locking harness to speed up the handling and dumping of barrels and drums. It receives the

Equipment

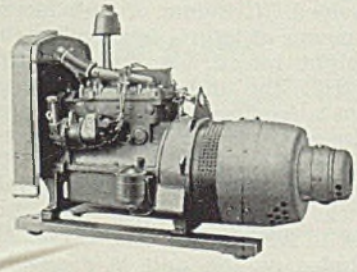
drum or barrel directly from the truck without any adjustments. A



spring toggle, shown in the illustration, locks the barrel to the harness. The latter is arc welded throughout and can be made for any size drum.

Electric Plants

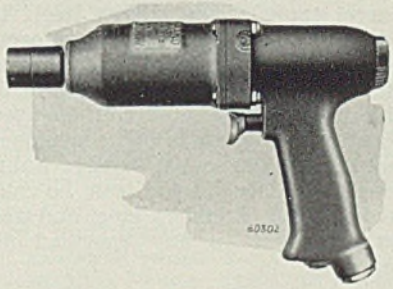
■ Kato Engineering Co., Mankato, Minn., announces three new low-speed 1200 revolutions per minute alternating current electric plants for either 2 or 3-wire service or three phase, at 60-cycles. Their generators are of the revolving armature type, generator frame being mounted directly to engine bell housing. Plants are furnished both with separate exciter attached to outer generator endbell and also



with exciter winding carried on main alternating current armature. Armature laminations are 26 gage silicon steel, pole pieces are of laminated construction. The complete engine and generator assembly of each unit is mounted on rubber, permitting installation of plant without bolting down to foundation. Design is such that plant used for portable truck or moving vehicles can be anchored without restricting action of rubber mountings. The 5000-watt size can be furnished with full automatic control. The larger sizes, the 7500 and 10,000-watt units, are available only with remote control. Each unit is powered with a LeRoi 18.5-horsepower 4-cylinder 4-cycle water-cooled engine.

Impact Wrench

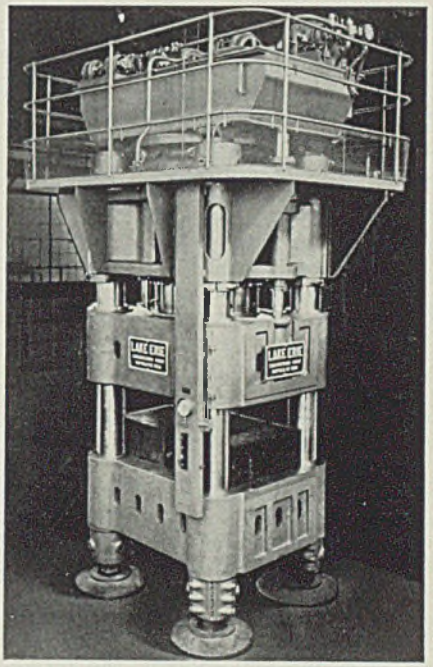
■ Ingersoll-Rand Co., Phillipsburg, N. J., announces a new lightweight size 504 air-operated impact wrench which can handle bolts up to and including ⅝-inch. It is designed with the patented Pott impact wrench principle which localizes steel to steel impact without transmitting shock to other parts of the tool. A form-fitting pistol grip handle,



short overall length and small nose diameter permits its operation in close places. This tool is ideal for modern industrial plants and assembly departments. It weighs 4 pounds and has a working speed at 90 pounds pressure of 1050 revolutions per minute.

Aircraft Press

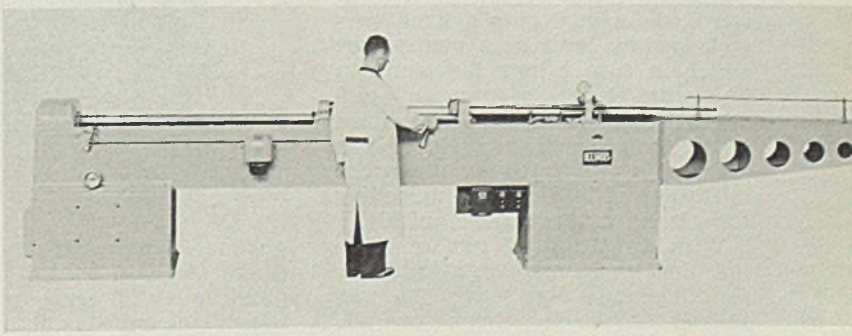
■ Lake Erie Engineering Corp., Buffalo, has introduced a new 5000-ton single action hydraulic press furnished with rubber pad and steel bolster together with automatic motorized loading tables for high production of aircraft parts. It is of the self-contained type with pumping unit located on top. The stand-



ardized design of this press has wide applications in the metal forming field. It combines fast operation, low cost dies, quick change-over of dies, quick handling of stock and finished pieces and convenient control of pressure. Push-button controls are grouped in panels quickly accessible to operators. When two or more are operating the press, controls interlock for safety. The controls provide for starting, stopping and semiautomatic operation and inching. The press also is provided with an adjustable pressure and stroke control.

Broaching Machine

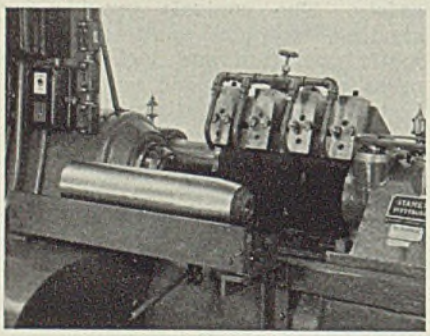
■ Illinois Tool Works, 2501 North Keeler avenue, Chicago, has introduced a new broaching machine for rifling gun barrels. It is a screw type machine, the screw being driven through V-belts by a reversible motor. The free floating, ball-bearing jaw type puller contains a safety link which protects the broach against breakage and the by-pass valve of the high pressure coolant unit is set between 150 and



300 pounds per square inch, depending on the size and length of the barrel. All oil flows through a purolator unit in order to remain clean. For rifling gun barrels the unit is equipped with special steady rests, interchangeable grinding and polishing spindles and a diamond wheel dressing device. A rifling broach inspection fixture provides visual inspection through a microscope of 20 X magnification. Sizes and steps of the broached teeth are checked by a snap-gage indicator arrangement. For face inspection, the broach is swiveled to a high angle position. Broaches are pulled through the barrel and produce their own lead. No other device for turning besides a freely rotating puller is required. Pressure for lubricant is built up in a chamber which is slipped up into the broach after it has been inserted into the barrel. Locked into position, the pressure chamber forces the lubricant over the broach and through the barrel. The construction of the broach facilitates passage of large amounts of oil. Besides acting as a lubricant and coolant, the oil removes chips from the cutting edges and accumulates them at the back of the preceding tooth.

Shell Turning Machine

■ In the description of the shell turning machine offered by William K. Stamets, Jenkins Arcade building, Pittsburgh, presented in this department Aug. 11, mention was made



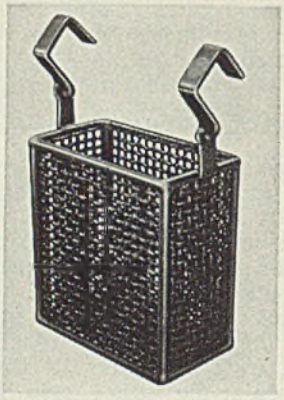
of special facilities for quick loading and unloading of work. These handling facilities were not, however, apparent in the illustration. Therefore, another view of the machine, which brings them out effectively, is presented herewith.

From a conveyor, the shell bank is rolled forward onto a hand-operated loading lever as shown above, which in turn brings the blank in line with centering jaws and tailstock center. Removal of machined blank is accomplished through a reversal of this process, the entire operation of loading and unloading thus being accomplished quickly.

With a battery of two of these machine—one for roughing and one for finishing—twenty-five 155 millimeter shell per hour can be rough and finished turned. This is mentioned here to correct the impression conveyed by the previous article that one machine alone could rough and finish at that rate.

Scrap Baskets

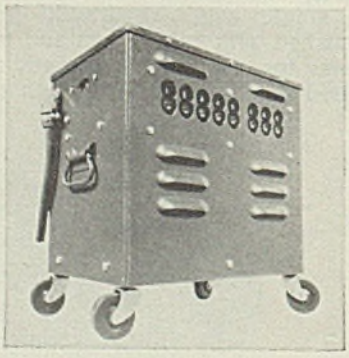
■ Hanson-Van Winkle-Munning Co., Matawan, N. J., has placed on the market a new type of rubber covered basket for handling scrap anodes. It embodies two hooks, which allow the basket to be hung on anode rods in still and plating



barrel tanks. The basket itself is of steel wire with proper reinforcements at the top, at all ends and at the bottom. Its mesh is welded to the frame. The unit can be used in solutions where temperature does not exceed 180 to 190 degrees Fahr. Hooks for the basket can be furnished 4 or 5 inches long and the basket itself to any specified dimension.

Midget Welder

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has introduced a new midget WT-1 Marvel Flexarc welder for use in welding light gage metal, castings and drive shafts. It is offered complete with all accessories. The latter includes electrode lead and holder, work lead, helmet and a supply of electrodes. Adjustment



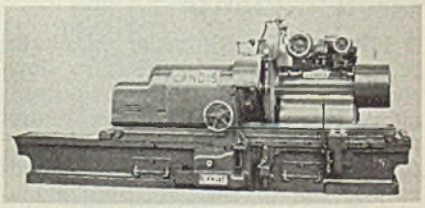
of the welding current over a range from 20 to 140 amperes is provided by 15 steps with proportioned increments between steps. Full load rating is 110 amperes, 30 minutes, 30 load volts, when used on 220-volt 60-cycle lines. Approximate dimensions of the unit are 14½ x 12⅛ x 20 inches long. Weighing only 160 pounds, the welder is supported on castors.

Air Drill

■ Independent Pneumatic Tool Co., 600 West Jackson boulevard, Chicago, has introduced a new No. 377 close-corner air drill for heavy duty close quarter work. Its power is derived from the surplus power delivered by its governor-controlled motor. Available in nonreversible and reversible types, the unit does not chatter and provides clean, smooth, full-strength threads.

25-Inch Grinder

■ Landis Tool Co., Waynesboro, Pa., announces a new 25-inch type D radial crank grinder, which, with proper tooling, is suitable for a wide variety of operations. Having work speeds of 30 or 55 revolutions per minute to facilitate changing work, its design is such that work rotation will always stop automatically at the same point. The machine features



a 42-inch diameter grinding wheel which permits a large amount of wheel wear. For web face operations a movement of 12 inches is provided. Grinding of web faces is by means of lateral feed rather than straight infeed. A lever at front controls the direction of the machine's feeding movement, while a valve regulates speed of the slow or dressing feed. Operations are further facilitated by a second valve which permits a quick shift from slow to fast feed or vice versa. Also included on the unit is a shoulder grinding attachment. This permits operator to feed the grinding wheel laterally, after it has been brought in to grinding position, by a handwheel. The amount of feed is adjustable and can be set for continuous duplication. Hydraulic power is utilized to traverse the work table. General control of the machine has been centralized to the extent that a lever will cause work rotation to start or stop, the work table to traverse either right or left. Floor space required by the machine is 8 feet 10 inches by 16 feet. Net weight, including electrical equipment is 22,200 pounds.

Helpful Literature

1. Hard-Facing Metals

Stoody Co.—48-page illustrated bulletin No. 106—deals with hard-facing metals, tungsten carbide inserts, tungsten carbide in tubes, grinders, welding rods, sand blasting nozzles of tungsten carbide, electrode holders, and universal bit holders. Composition, application and use of hard-facing metals are discussed in detail. Price lists are included.

2. Steel Stock List

Scully Steel Products Co.—284-page spiral-bound stock list and reference book contains descriptions of complete line of steel products as well as copper and brass. Supplement contains useful information on S. A. E. numbers, color code, gages, circumference of circles and trade customs.

3. Welded Design

Lincoln Electric Co.—4-page illustrated application sheet No. 76 is one of series "Machine Design" data sheets showing application of welded construction to common machine parts. This one covers "Weldesigning an Outboard Bearing Bracket."

4. Hydraulic Cylinders

Galland-Henning Manufacturing Co.—12-page illustrated bulletin No. 82 is descriptive of "Nopak" cylinders which are designed for air or hydraulic service. Design, operation, cylinder capacities, dimensions and applications of double-acting non-rotating types are given.

5. Cutting Oils

D. A. Stuart Oil Co.—18-page pocket-size booklet describes line of cutting oils for various metal working operations. Principle of cutting oils, when to use certain types of cutting fluids, recommended oils for various S. A. E. alloys are enumerated with action photographs.

6. Billet Shears

Buffalo Forge Co.—24-page illustrated bulletin No. 3295 gives complete specifications on line of billet shears. Capacities of various machines are given. Section is devoted to description and specifications of vertical, special and diagonal bar cutters.

7. Roll Seam Welders

Taylor-Winfield Corp. — 8-page illustrated bulletin No. 1001 is devoted to three sizes of roller seam welders. Topics covered include general types and ratings, electrical conductivity, welding wheels, shipping weights, types of drives and general seam welding data.

8. Shop Equipment

Lyon Metal Products Inc.—40-page illustrated catalog No. 331-D lists steel shop equipment. Work benches, stools, stock and tool carts, tool cribs, cabinets, two and three shift drawer inserts, sheet metal workers' benches and welding benches are pictured and described in detail.

9. Centrifugal Pumps

Allis-Chalmers Manufacturing Co.—8-page illustrated bulletin No. B6059 describes "Electrifugal," single suction, double suction, multi-stage and open runner centrifugal pumps. Capacities, features, construction, and applications of each type are covered.

10. Aluminum Bronze

Ampco Metal, Inc.—56-page illustrated file No. 41 is collection of engineering data selected from regular sheets issued monthly since January, 1934. Wide range of subjects dealing with alloys of aluminum bronze class and their application is covered.

11. Engineering Consultants

E. J. Cheney & Co.—4-page bulletin, "Engineers and Consultants to American Industry, Serving Since 1920," explains services offered by this company. Industrial, defense projects, public and private utilities and public works are some of services rendered.

12. Tar Base Paints

Koppers Co., Tar & Chemical division—4-page illustrated bulletin No. TD-1 is devoted to tar-base paints, with particular emphasis on their damp-proofing property. Paints for concrete, metal, brick and other surfaces are described.

13. Cast Irons

Sorbo-Mat Process Engineers—24-page illustrated bulletin announces "Sorbo-Mat" process of producing modern specification cast irons. Operation of process, structure of iron, strength and mechanical properties, advantages, flexibility of process and designations for metal specifications are some of topics treated extensively.

14. Electric Contact Gages

Pratt & Whitney—4-page illustrated bulletin presents details of design and construction of multiple electric contact gages for fast accurate inspection methods. Gage designed for simultaneous checking of several different diameters of shell is pictured and described.

15. Drawing Lubricants

Magnus Chemical Co.—4-page illustrated bulletin discusses drawing lubricants for dry and wet drawing of ferrous and non-ferrous wire. Drawing of low, medium and high carbon steel wire and high speed continuous drawing of low carbon steel are covered. Wire coating, cleaning and rust protection are also described.

16 Furnace Atmospheres

Surface Combustion Corp.—8-page illustrated bulletin No. SC-97 discusses common furnace atmospheres, their composition, production, application and results. Effects of oxygen, nitrogen, carbon dioxide, carbon monoxide and other common gases upon steel at elevated temperatures are covered in detail. Line drawings show details of atmosphere generators.

17. Voltage Relays

Westinghouse Electric & Manufacturing Co.—8-page catalog section No. 41-291 describes relays to protect 115 to 460 volt, 60 cycle circuits or apparatus against voltage changes of any predetermined value. Voltage-time curves show per cent of maximum closing voltage at each setting of relay time lever. Wiring diagrams show physical arrangement of coils and contacts as well as electrical connections.

18. Liquid Level Controls

Photoswitch, Inc.—4-page illustrated bulletin No. 1100 describes electronic relays for level control of liquids and powders. Types are available to provide single level indication and control, on and off pump control at two levels, boiler feedwater control and tank condensate signals. Wiring diagrams amplify text.

19. Cutter & Tool Grinder

Cincinnati Milling Machine Co.—32-page illustrated catalog No. M-962 contains complete information on "Cincinnati" No. 2 cutter and tool grinder. Features of machine are explained pictorially and in text. Standard attachments for universal machines are described. Complete specifications are given.

20. Alloy Steel

Jessop Steel Co.—6-page illustrated folder on "Truform" nonshrinkable alloy steel describes this material which minimizes distortion of tools and dies. "Truform" is oil hardening tool steel possessing low coefficient of expansion, toughness and wear resisting properties.

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21. High Strength Cast Iron

Gardner-Denver Co.—24-page illustrated bulletin on "GarDurloy" high strength cast iron explains manufacture, control and engineering involved. Grain structure, density, strength, mechanical properties and applications of five grades are given.

22. Nickel Alloy Steels

International Nickel Co.—104-page illustrated data booklet, "The Properties and Applications of Quenched and Tempered Nickel Alloy Steels," section II, No. 4. Charts and tables provide ready data on alloy steels up to about 6 inches in diameter or thickness.

23. Grinders

Hammond Machinery Builders, Inc.—4-page illustrated bulletin No. GP-12 is descriptive of 10, 12 and 14-inch "OK" grinders in bench and pedestal types for tools and light snagging operations. Specifications are given for all three machines.

24. Valves

Homestead Valve Manufacturing Co.—48-page illustrated catalog No. 38 presents complete data on straightway, lubricated, lever sealed, angle, three-way, four-way, and operating valves. Section is devoted to "Hypressure Jenny" steam cleaner for all types of industrial cleaning applications.

25. Glow Lamps

General Electric Co.—Illustrated catalog sheet No. Y-0251 gives essential facts regarding line of glow lamps which finds application in homes, commerce and industry. Typical uses of neon glow lamps are shown and complete specifications are given on available lamps.

26. Heavy Duty Lathe

Axelson Manufacturing Co.—10-page catalog section is descriptive of "Axelson" 14-inch heavy duty lathes which feature 24-speed selective geared head. General description and complete specifications for this heavy duty lathe are given.

27. Industrial Furnaces

Despatch Oven Co.—4-page illustrated bulletin No. 83 describes line of tempering and drawing furnaces for tools, dies, precision parts, nonferrous castings and parts, aluminum forgings and rivets, and for use in metallurgical laboratories. Construction features, specifications and operation of equipment are explained.

28. Sponge Rubber

B. F. Goodrich Co.—Illustrated catalog section No. 9790 is descriptive of milled sponge rubber. Uses, standard grades, special grades and shapes, stock size slabs, special slabs and foamed latex sponge are some of data included.

29. Impact Coal Pulverizer

Whiting Corp.—4-page illustrated bulletin FY-103 explains features of impact coal pulverizer for aiding in accurately controlled kiln firing. Several illustrations show typical installations and text discusses details of design and construction.

30. Aircraft Torch

National Cylinder Gas Co.—1-page illustrated catalog section No. NR-120 describes "Rego AC" welding torch especially designed for use in aircraft work. Line of welding tips of pure copper are shown with tables of dimensions. Prices are included.

31. Tool Room Lathes

South Bend Lathe Works—8-page illustrated bulletin No. 52 is devoted to line of tool room lathes. Units are available in several sizes for either bench or floor mounting. Capacities, speeds and dimensions are covered. Attachments and accessories are also pictured and described.

32. High Speed Tool Steel

Bethlehem Steel Co.—8-page illustrated data book No. 143, section D-6 is descriptive of "Bethlehem HM" high speed tool steel. Instructions for working include forging, annealing, hardening and tempering. Characteristics are also included.

33. Unit Heaters

Grinnell Co.—56-page illustrated catalog No. 5-E explains features of "Thermoller" unit heating, and describes control, air conditioning type, electric type, industrial type and factory type of unit. Capacities, wiring diagrams and complete specifications are given for various units.

34. Well Water Systems

Layne & Bowler, Inc.—4-page folder illustrates pump and well water systems installed in defense projects. All installations in military camps, defense projects, and industries made recently are listed.

35. Furnace Controller

Brown Instrument Co.—8-page illustrated bulletin No. 74-2 explains operation, application and maintenance of furnace pressure controllers which can be used to maintain constant furnace pressure automatically. Schematic diagram shows how system should be hooked-up for operation.

36. High Speed Steel

Crucible Steel Co.—4-page folder No. TS302 presents complete data on "Rex MM" tungsten-molybdenum high speed tool steel. Recommended service, analysis, hardness, forging, annealing, hardening and tempering of this alloy are covered.

37. High Speed Steels

Vanadium-Alloys Steel Co.—8-page booklet describes "Van-Lom," "6-6-2," and "Neatro" high speed steels of molybdenum type. Analyses are presented in tabular form, together with other physical data. Important advantages, uses, heat treatment and effects of tempering are reported for each type.

38. Pneumatic Equipment

Curtis Pneumatic Machinery Co.—26-page illustrated handbook "How Air Is Being Used In Your Industry" contains survey of applications for "Curtis" pneumatic equipment in 48 industries. Among industries covered are automotive plants, box factories, tobacco processors, steam and electric railroads, foundries, forge shops and furniture factories.

39. Pot Furnaces

Mahr Mfg. Co.—4-page illustrated bulletin No. 110 deals with oil and gas fired pot furnaces for use with lead, cyanide and other molten bath heat treating materials. Construction of furnace, pots, hood, burners and lining are enumerated. Tables show complete specifications for 31 models.

40. Bulk Materials Handling

Garlinghouse Brothers—4-page illustrated bulletin No. 67 is devoted to foundry and factory equipment. Variety of wheelbarrows for general foundry use, for charging, for flasks, for cores, for hot castings and loose materials are described with dimensions and salient features.

41. Power Distribution

Bull Dog Electric Products Co.—12-page illustrated bulletin No. 412 describes "Lo-X" bus ducts which are redesigned feeder type ducts for large ampere capacities. Steel casings have been substituted for aluminum ones with result that voltage drop from reactance has been materially reduced.

42. Refractory Plastic

Basic Refractories, Inc.—4-page illustrated bulletin No. 74-2 explains operation on "695" which is highly refractory magnesia chrome plastic for tap hole construction, spout linings and many hot repairs. It is mixed readily with water, easy to apply, sets quickly, and is claimed to give long service.

43. Cone Drive Gearing

Michigan Tool Co.—44-page illustrated, plastic bound bulletin No. CW-41A is design and rating manual for engineers on "Cone-Drive" gearing. Included are specifications of standard blanks for worms and wheels, tables of all sizes of ratios for which tooling is available, charts and formulas for computing sizes, stresses, loads and other data.

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Shell Forging System

(*Continued from Page 51*)

dies and mandrel, now passing idly through the dies, receive a blast of air and water to cool them. On the return stroke they are sprayed with a lubricant containing the "dag" colloidal graphite.

Further indexing of the table now brings the die in which the first shell had been pierced into position to receive another billet. Prior to this, however, it has been carried by the indexing of the table to, first, a position in front of an air jet which thoroughly blows out the die, and second, in front of a lubricating jet which sprays it evenly with the colloidal graphited lubricant.

Design Features: Not shown in Fig. 1 is a descaler which may be provided ahead of the automatic die loader. In this case the billet is placed in the descaler where scale is removed automatically from the billet. A special device scrapes the piercing end of the billet, producing clean metal—a protection against scale spots in the cavity of the shell. From the descaler the billet is automatically transferred to the dies through the loading carrier.

Index operation of the die table is provided through a Geneva drive, while a set of toggle links produces the proper dwell of the anvil that closes the back end of the dies during the time the billets are being pierced. See Fig. 3.

Punches and mandrels are provided with a "graphoid" surface prior to installation. This surface, in which minute particles of colloidal graphite actually form a part of the surface material of the punch or mandrel, is obtained by dipping repeatedly in an aqueous dispersion of "dag" colloidal graphite. The result is that the tool has a slick dry-lubricating finish maintained in service here by repeated spraying.

The lubricant for the punches is brought to the cooling stations in the die table through drilled holes from a central connection through which the lubricant enters through packing glands, Fig. 1. Flow of lubricant to each cooling station, as well as flow of water for cooling, is

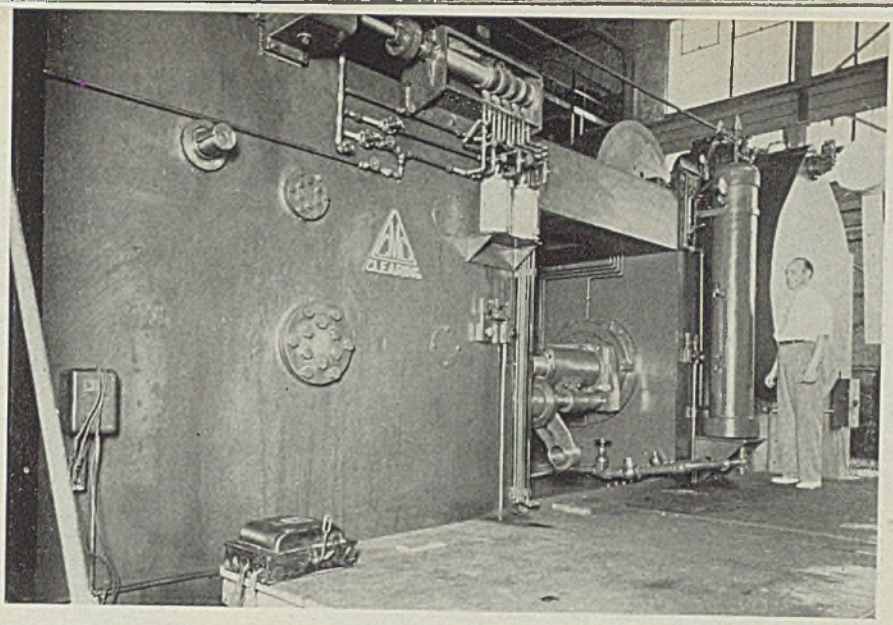


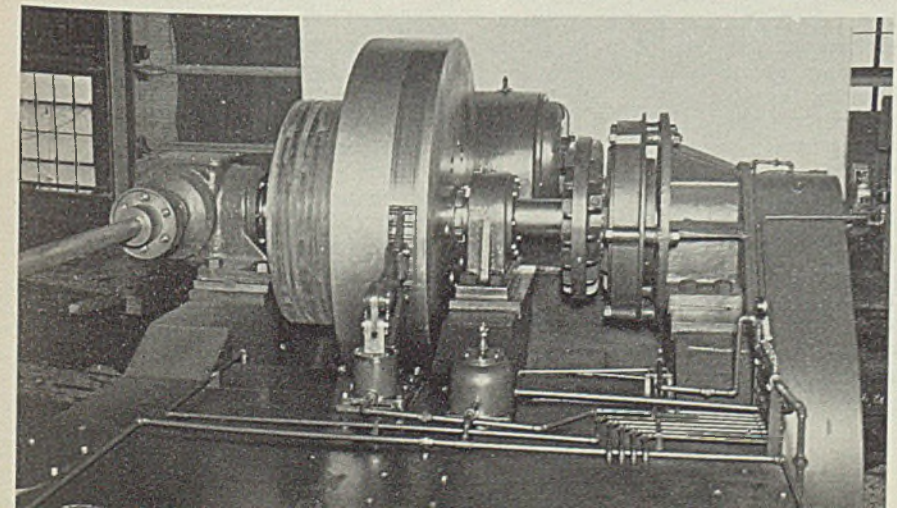
Fig. 7—Overall view from loading side, showing spray timing cams, piping and metering tanks, etc., as well as the reservoir tank for hydraulic strippers

controlled through cams.

All three piercing punches, with their combination self-aligning guides and automatic hydraulic strippers, are mounted on the same head. The drawing mandrel is located on a separate head, but both heads move simultaneously. The reciprocating motion of the punches and mandrel is obtained mechanically through large eccentrics, driven through double gearing, in turn, from the machine flywheel. The latter is driven by a 150-horsepower motor through V-belts. The drive unit is equipped with a solenoid controlled pneumatic clutch interlocked with a brake in such a manner that when the clutch is "on", the brake is "off", and vice versa.

The die and punch lubrication system is entirely automatic. The lubricant may be either the shell forging lubricant now nationally available and consisting of "Oildag" and "dag" graphite dispersion type 1175, suspended in a paraffin base oil, or it may be a special water dispersion of "dag" colloidal graphite blended with water-soluble oils, both developed by Acheson Colloids Corp., Port Huron, Mich.

Fig. 6—Drive unit—motor, flywheel, clutch and brake—located on top of machine



From the 110-gallon reservoir, the lubricant is piped to two metering tanks shown at the top of the machine in Fig. 1. On top of these metering tanks are venturi passages in which the lubricant is mixed with air. Release of air pressure to each line is controlled by cams above the tanks, these being timed with the machine to permit the sprays to go off and on at the proper intervals. One cam controls flow to the die table to lubricate the punches, another the line to the jet in front of the "empty die" station just ahead of the loading position, while a third line carries lubricant to the drawing die, where it is actuated during the return stroke.

Air and water sprays are similarly controlled, these sprays being separate in all cases except at the drawing die where air and water are mixed together to cool the die and mandrel.

Fig. 4 shows the complete machine. For every six strokes it produces three completed shell case forgings so each shell (at the 240 per hour rate) is in the machine a total of around 30 seconds. Since the time for each shell in the machine is identical, close control as to size and uniformity is possible. Furthermore, the self-aligning features of the punches and mandrel are designed to hold the runout of the forgings to exceptionally close limits so less material actually need be allowed for machining.

The Clearing Machine Corp., having successfully introduced automatic handling and lubrication in the present shell forging machine, thereby obtaining higher production, is now engaged in designing a new forging machine of the precision type to eliminate the need for excess metal in the billet. This machine is fully automatic and is based on the principle of controlled displacement of the metal. It is expected to handle shell forgings up to and including the 105-millimeter size at a rate of 250 to 300 shell per hour.

Aircraft Material Specifications

(*Concluded from Page 56*)

AMS	4829	Bearings—Copper Lead, 73-27 .....Steel Back
AMS	4822	Bearings—Copper Lead Tin, 71-25-3..Steel Back
AMS	*4825	Bearings—Copper Lead Tin, 74-16-10..Steel Back
AMS	4840	Bearings—Copper Lead Tin, 70-25-5 ....Castings
AMS	*4842	Bushings—Copper Lead Tin, 79-10-10....Castings
AMS	*4845A	Castings—Bronze, 88-10-2 .....As Cast
AMS	4860	Castings—Manganese Bronze .....As Cast

Carbon Steels

			SAE Grade Number
AMS	5010	Bars—Screw Stock	X1112
AMS	5022	Bars and Forgings—1.3 Manganese—Free Cutting	X1314
AMS	5024	Bars and Forgings—1.5 Manganese—Free Cutting	X1335
AMS	*5040A	Sheet and Strip—Deep Drawing—Annealed	1010
AMS	*5042A	Sheet and Strip—Low Carbon—1/2 Hard	1010
AMS	5050	Tubing—Low Carbon—Annealed	1015
AMS	5060	Bars and Forgings—Low Carbon	1015
AMS	5110	Music Wire—Commercial	1080
AMS	*5112A	Music Wire—Best Quality	1090
AMS	5122	Sheet—High Carbon—Hard	1095

Corrosion Resistant Steels

AMS	5510	Sheet—Annealed—18 Chromium, 8 Nickel.... Weldable
AMS	5516	Sheet—Annealed—18 Chromium, 8 Nickel .... Cold Rolled
AMS	5519	Sheet—Spring—18 Chromium, 8 Nickel..... Cold Rolled
AMS	5540	Sheet—Annealed—Nickel, Chromium, Iron
AMS	5570	Tubing—Annealed—18 Chromium, 8 Nickel.... Weldable
AMS	5580	Tubing—Nickel, Chromium, Iron
AMS	5610	Bars and Forgings—13 Chromium ..... Free Machining
AMS	5615	Bars and Forgings—13 Chromium, 1 Nickel, Low Carbon
AMS	5630	Bars and Forgings—17 Chromium, 1.0 Carbon
AMS	5640	Bars and Forgings—18 Chromium, 8 Nickel .. Free Machining
AMS	5645	Bars and Forgings—18 Chromium, 8 Nickel.. Weldable
AMS	5665	Bars and Forgings—Nickel, Chromium, Iron
AMS	5680	Wire—Welding—18 Chromium, 8 Nickel
AMS	5683	Wire—Nickel, Chromium, Iron
AMS	5685	Wire—Annealed—18 Chromium, 8 Nickel
AMS	5688	Wire—Spring—18 Chromium, 8 Nickel
AMS	5690	Wire—Screen—18 Chromium, 8 Nickel
AMS	5700	Steel—Valve—Chromium, Nickel, Tungsten

Low Alloy Steels

AMS	6240	Bars and Forgings—5 Nickel ....08-.14 Carbon 2515
AMS	6242	Bars and Forgings—5 Nickel ....15-.19 Carbon 2515
AMS	6250	Bars and Forgings—3.5 Nickel, 1.5 Chromium .....08-.12 Carbon 3312
AMS	6252	Bars and Forgings—3.5 Nickel, 1.5 Chromium .....09-.13 Carbon 3312
AMS	6253	Bars and Forgings—3.5 Nickel, 1.5 Chromium .....10-.13 Carbon 3312
AMS	6254	Bars and Forgings 3.5 Nickel,—1.5 Chromium .....14-.19 Carbon 3312
AMS	6290	Bars and Forgings—1.8 Nickel, .25 Molybdenum .....11-.17 Carbon 4615
AMS	6292	Bars and Forgings—1.8 Nickel, .25 Molybdenum .....15-.20 Carbon 4615
AMS	6294	Bars and Forgings—1.8 Nickel, .25 Molybdenum .....18-.23 Carbon 4620
AMS	6310	Bars and Forgings—1.8 Nickel, .25 Molybdenum .....33-.38 Carbon 4640
AMS	6312	Bars and Forgings 1.8 Nickel, .25 Molybdenum .....40-.45 Carbon 4640
AMS	6315	Bars and Forgings—1.8 Nickel, .25 Molybdenum ..... 105,000 Tensile 4640
AMS	6317	Bars and Forgings—1.8 Nickel, .25 Molybdenum ..... 125,000 Tensile 4640
AMS	6330	Bars and Forgings—1.25 Nickel, .6 Chromium .....33-.38 Carbon 3135
AMS	6332	Bars and Forgings—1.25 Nickel, .6 Chromium .....40-.45 Carbon 3140
AMS	6335	Bars and Forgings—1.25 Nickel, .6 Chromium ..... 105,000 Tensile 3140
AMS	6337	Bars and Forgings—1.25 Nickel, .6 Chromium.. ..... 125,000 Tensile 3140
AMS	6352	Sheet—Annealed—.8 Chromium, .2 Molybdenum .....30-.35 Carbon X4130
AMS	6360	Tubing—Normalized—.8 Chromium, .2 Molybdenum .....28-.33 Carbon X4130
AMS	6370	Bars and Forgings — .8 Chromium, .2 Molybdenum .....30-35 Carbon X4130
AMS	6380	Bars and Forgings — 1 Chromium, .2 Molybdenum .....35-.42 Carbon 4140
AMS	6382	Bars and Forgings — 1 Chromium, .2 Molybdenum .....38-.46 Carbon 4140
AMS	6410	Bars and Forgings—Nickel, Chromium, Molybdenum .....26-.31 Carbon
AMS	6412	Bars and Forgings—Nickel, Chromium, Molybdenum .....35-.40 Carbon X4340
AMS	6415	Bars and Forgings—Nickel, Chromium, Molybdenum .....35-.45 Carbon X4340
AMS	6440	Bars and Forgings—1.35 Chromium 52100
AMS	6455	Sheet — Annealed — Chromium, Vanadium—Spring 6150
AMS	6470	Bars and Forgings—Chromium, Molybdenum, Aluminum—Nitriding

Accessories, Fabricated Parts and Assemblies

AMS	7210	Cotter Pins—18 Chromium, 8 Nickel
AMS	7220	Rivets—Aluminum 2S
AMS	7222	Rivets—Aluminum Alloy A17ST
AMS	7225	Rivets—Steel .....Annealed
AMS	7228	Rivets—18 Chromium, 8 Nickel
AMS	7240	Lockwashers
AMS	7320	Rings, Sealing Bronze .....Rockwell B 72-82
AMS	7322	Rings, Sealing Bronze .....Rockwell B 85-92

*New or Revised Specifications issued Sept. 1, 1941.

New Protective Coating Is Chemical Resistant

■ A new protective coating material, Miccroplastic, which provides chemical resistance to all acids and plating solutions, alkali cleaners and petroleum spirits, is offered by Michigan Chrome & Chemical Co., 6340 East Jefferson avenue, Detroit. Featuring the flexibility of soft rubber, it will not crack. It provides exceptional adhesion to every portion of any metallic surface it covers, regardless of the shape or size of the plating rack, anodizing rack or other object which is coated. The material is very free-flowing and is applied directly to the cleaned surface. It is dipped easily—one dip requiring as little as five seconds for submersion and emersion. It also contains high solids, dries to a high gloss, and it makes a good coating for hard chromium plating racks.

Application of the material is simple—the only equipment required is a small dipping tank and a baking oven. After submersion and emersion, racks should be allowed to air dry for about a half hour and then baked for one hour at 225 degrees Fahr. Seven coats are recommended for each rack.

Conserves Tungsten Yet Improves Product

■ An effective means for conserving tungsten is revealed in an announcement by the Forging & Casting Corp., Ferndale, Mich., of a new line of electrically welded composite steel blanks for making dovetail forming cutters for use on automatic screw machines.

According to the company, the blanks are made by electrically welding, by a special process, a cutting face of high-speed steel to a nonhardenable base of mild steel, reducing by at least one-half the quantity of high-speed steel required for a tool of a given size, resulting in a proportionate saving of tungsten.

Unlike some methods of alloy conservation which involve principally the use of substitutes, these composite steel blanks, according to their manufacturer, offer advantages of their own. Important among these is the fact that the nonhardenable tough base minimizes the inherent tendency of solid high-speed steel tools, during heat treating or because of excessive strain when working, to break out at the sharp dovetail corners or at the screw holes where the tools are attached to the holding fixture.

Commercial Standard on Drill Fittings Revised

■ Revised commercial standard covering diamond core drill fittings has been issued by the National Bureau of Standards, Department of Commerce, for manufacturers and consumers of equipment used in exploratory deep drilling operations.

It has been customary to make drill fittings interchangeable, that parts and fittings made by one manufacturer may be connected in case of emergency with those made by another. The revised standard, known as Diamond Core Drill Fittings, Commercial Standard CS17-42, records standard dimensions, tolerances and terminology of these fittings.

Copies are obtainable from the Superintendent of Documents, Washington, at unit cost of 10 cents.

DIED:

Donald G. Henderson, 51, chairman of the board, Consolidated Steel Corp., Long Beach, Calif., Sept. 14. Associated with the company over ten years, Mr. Henderson formerly served as treasurer, vice president and president.

♦

George J. Campbell, founder and president, International Chain & Mfg. Co., York, Pa., Sept. 9.

♦

Charles H. Roberts, 51, treasurer, Johns-Manville Corp., New York, Sept. 10, in that city.

♦

V. P. Staub, 73, president, New Milford Foundry & Machine Co., New Milford, Conn., Sept. 12, in that city.

♦

Jay G. Robinson, 79, president, National Railway Devices Co. Inc., Chicago, in that city, Sept. 12. He founded the company in 1909.

♦

Anton K. Kusebauch, 72, retired engineer and designer for Westinghouse Electric & Mfg. Co., Sept. 12 in Avalon, a suburb of Pittsburgh.

♦

Alfred H. Dyson, 65, patent attorney and affiliated with Allis-Chalmers Mfg. Co., Milwaukee, since 1931, Sept. 7.

♦

James C. Lenahan, 49, purchasing agent, Philadelphia plant, Link-Belt Co., recently at Ocean City, N. J. He had been associated with the company 36 years.

♦

Paul Jennings Forsythe, 50, St. Louis district manager, Wagner Electric Co., and former president, Electrical Manufacturers Association, Aug. 20, in St. Louis.

♦

William T. Vollborth, 53, Chicago district sales manager, Free Wall Clip Division, United States Machine Corp., Lebanon, Ind., in Bloomington, Ill., Sept. 9.

♦

Daniel Dana Jackson Sr., 71, retired professor and executive of the department of chemical engineering, Columbia University, New York, recently at his summer home in Mattituck, Long Island. He was a member of numerous engineering societies.

♦

Frank Lewis Eidmann, 53, since 1930 professor of mechanical engineering, Columbia University, New York, in that city, recently. He was a member of a number of engineering societies, and is said to have been granted 14 patents for mechanical inventions.

Abrasive Wheels

(*Concluded from Page 64*)

account of their close structure are not adapted to all types of grinding operations.

Shellac Bond: This wheel employs just ordinary shellac for the bond. In general, it leaves a high finish and so is preferred for grinding chilled rolls, automotive engine camshafts and for precision operations on small grinding machines, especially those where it is necessary to use thin, delicate wheels. Shellac wheels are used for certain milling cutter work for the same reason.

Shellac bonded wheels are made quickly. Ground shellac mixed with the abrasive is placed in a mold. Then the wheel is baked under pressure for a short time. Shellac wheels are quite durable and thus are preferred in the case of certain types of comparatively thin wheels. High finish imparted to work by shellac wheels, is another distinct advantage.

One disadvantage of the shellac wheel is that it never is as fast cutting as one of vitrified bond since shellac itself is not an abrasive. Also the pressure used in forming a shellac wheel tends to create a dense structure.

Rubber Bond: One of the early types, the rubber bond, is still holding its own on many operations including heavy grinding on malleable castings, billets and edge tools; flute grinding of taps and reamers; certain cylindrical grinding operations such as ball races and rollers for roller bearings; pointing needles; grinding card clothing; and grinding welds on automobile rims.

Rubber bonded wheels must be run at high speed to cut effectively. Furthermore, they throw off an objectionable odor. Advantages are great strength and the fine finish they afford under certain conditions.

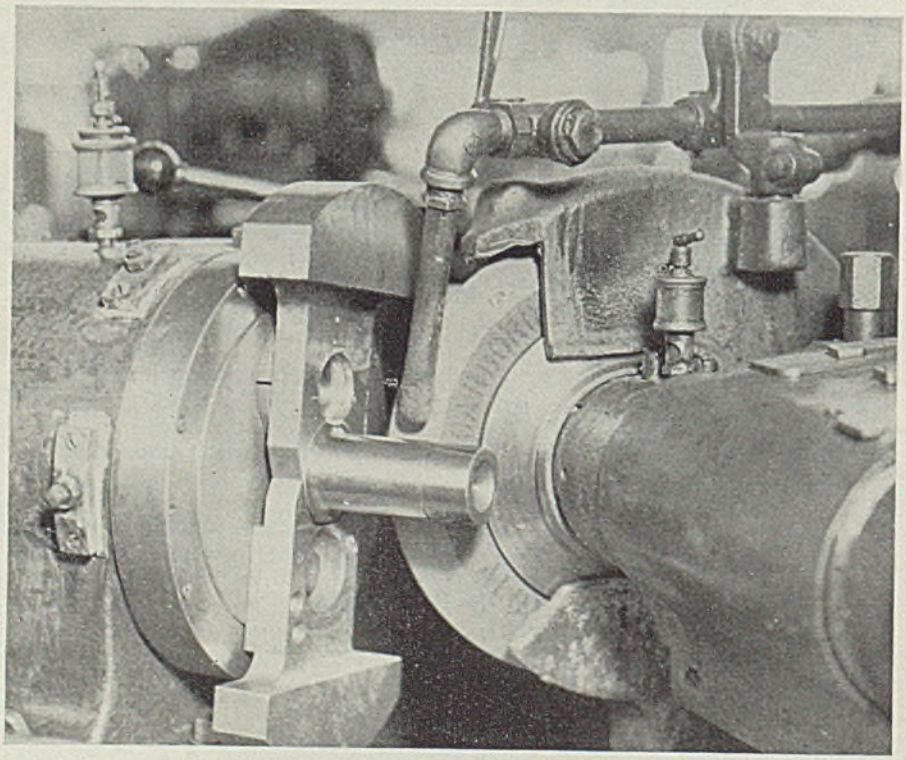
Synthetic Resin Bond: The latest type of bond to appear on the market is synthetic resin. Wheels so bonded have become quite popular for operations ranging all the way from grinding heavy castings under swing frame machines to precision work. These wheels are being used for many operations heretofore performed with shellac or rubber bonded wheels. They are used on cylindrical work, both on center and centerless machines. They show excellent results in grinding heavy rolls, on thread grinding and on surface grinding of various kinds.

Advantages of synthetic resin bonded wheels are great strength; ability to impart a fine finish to hold a given shape. Usually relatively high speeds must be used—speeds not always practicable on some of older type grinders. That, however, is an argument for better equipment, rather than against synthetic resin bonded wheels. Much experimental work is still being carried out with this new bond and it appears that its future is exceedingly bright.

Summation: Summing up the facts behind intelligent grinding wheel selection we find: First, grit number determines degree of finish which will be attained; second, grade determines ability of the wheel to stand up to its work and also governs wheel wear; and third, the bond must be selected to suit the class of grinding to be performed.

In other words, success in any grinding operation comes through "getting the right wheel in the right place." Grinding wheels should always be operated as nearly as possible to the speeds recommended by the maker, otherwise safe, efficient performance cannot be expected. Above all, never run a wheel at high speed unless it is mounted carefully in a substantial machine whose wheel spindle bearings are properly adjusted.

Grinding airplane engine crankshafts is an exacting job calling for a wheel that will hold its shape well



Tin Review Features Two New Developments

■ Several important new developments are described among other subjects in the current issue of Tin Research Institute's quarterly review No. 10, "Tin and Its Uses". Among them are a new alloy of tin, zinc and nickel, and a new tin-rich bearing alloy.

The first is a substitute for the aluminum formerly used in the manufacture of milk bottle caps. It is said to have a remarkable combination of strength and ductility, the tin foil rolled from this alloy having 2½ times the strength of ordinary tin foil.

The second development is suitable for use in the tail-shaft bearings of large ocean-going vessels. It features high corrosion resistance, improved antifriction qualities, and does not seize in sea water even in absence of lubrication.

The publication is available gratis by writing to Battelle Memorial Institute, 505 King avenue, Columbus, O.

New Die Speeds Production of Dials

■ To accelerate defense production of timing rings, dials, graduated rings and other precision adjustment parts, Acromark Corp., 251 North Broad street, Elizabeth, N. J., is offering a new type of steel stamping die for punch press use. Its design permits it to be set in the press with the part to be stamped centered underneath it in a fixture.

Each impression, according to the company, results in an accurately graduated and numbered part, and the method will increase production as much as 100 to 1 depending upon the number of graduations.

Activities of Steel Users and Makers

■ WM. DEMMLER & BROS., Kewanee, Ill., are building a 40 x 140-foot steel frame addition to their plant to house increased machine shop and assembly facilities, also new offices. H. L. Demmler is general manager, and John N. Demmler, sales manager.

♦

Name of the Stearman Aircraft Division of Boeing Airplane Co. has been changed to Wichita Division of Boeing Airplane Co.

♦

Charles Bruning Co. Inc., Chicago, is now located in its new plant and office building at 4700 West Montrose avenue.

♦

Meehanite Metal Corp., Pittsburgh, has granted manufacturing rights for Meehanite castings to Cooper Engineering Ltd., Bombay, India, and the Globe Engineering Works, Capetown, South Africa.

♦

Galv-Weld Inc., Dayton, O., licensor of regalvinizing processes and materials, has appointed Eagle-Picher Lead Co., Cincinnati, as exclusive manufacturer of Galv-Weld materials for distribution to licensed users of the Galv-Weld processes.

♦

Buffalo Forge Co., Buffalo, has completed arrangements for acquisition of the entire capital stock of Buffalo Pumps Inc., North Tonawanda, N. Y., with which it has been affiliated many years, and has filed registration statement with the Securities and Exchange Commission covering 115,120 shares of common stock.

♦

Republic Aviation Corp., Farmingdale, N. Y., is erecting a two-story office building, to have 45,000 square feet of floor space. Cost of building and equipment, provided under a United States government facilities agreement, is approximately $300,000. John H. French Co., New York, and Amityville, N. Y., is general contractor.

♦

Protective Coatings Inc., Detroit, has been organized to manufacture a complete line of products for the protection and preservation of materials. The company is headed by H. Tom Collord, who is the founder of Collord Inc., producer of rubberized production parts for the automobile industry, and also founder and president of Paramount Rubber Service Inc., Detroit.

Mathematics for Those Needing Further Study

■ *Mathematics*, by John W. Breneman; cloth, 210 pages, 6 x 9 inches; published by McGraw-Hill Book Co., New York, for $1.75.

This text was prepared under direction of the division of engineering extension of Pennsylvania State College, the author being associate professor of engineering mechanics in that school.

The volume was written for the express purpose of providing an adequate study for the person whose formal schooling in this field has not been completed. It also is designed for those who lack sufficient mathematics, the study of which will aid advancement in their positions in industry. It is particularly adapted to those who desire to refresh their knowledge of the subject and for those who wish to add to their ability by studying at home.

Problems and illustrative examples have been taken from practical situations in industry and engineering, straightforward and based on the fundamentals of the subject applicable to the principles being studied or taught.

It includes a brief review of arithmetic, fractions, algebra, including simultaneous and quadratic equations and the use of handbook tables in the appendix. Fundamentals of plane geometry are covered by the use of geometrical constructions whereby geometrical theorems are made into practical problems. Trigonometry has been dealt with in a useful manner and incorporates the fundamental laws solved by both trigonometrical and natural functions.

Issues New Book for Student Machinists

■ As a timely and practical contribution to defense training, L. S. Starrett Co., Athol, Mass., has issued a manual of modern shop practice called "The Starrett Book for Student Machinists". Combining much of the material formerly published in two previous publications, the new book is actually both an instruction manual and a reference handbook.

In order to make the book completely up-to-date and as practical as possible, the text was prepared in co-operation with a number of vocational school and industrial shop training instructors. It contains 184 pages, over 200 diagrams and photographic illustrations and 30 reference tables. The book is completely indexed and includes such essential chapters as: "How to read working drawings, precision tools and measuring practices, how to read a micrometer and a vernier, fits and limits of tolerance, bench work, chipping, filing, metal sawing, drilling, lathe work, screw threads and tapers, tool-making, jigs and fixtures. The book sells for 75 cents per copy.

Offers Time Saver For Arc Welding

■ Engineers, supervisors, purchasing agents, operators, and others who use or supervise the use of arc welding electrodes may be interested in the new Arc Welderule being offered by General Electric Co., Schenectady, N. Y., which saves time in estimating electrode requirements.

Operating similar to a slide rule, the Arc Welderule reads directly the length of arc welded joints obtainable per 100 pounds of electrode, also the pounds of weld metal deposited per 100 pounds of electrode. It covers 11 different commonly used sizes and types of joints; also 22 different sizes and types of popular electrodes in both the 14 and 18-inch lengths. It also enables more accurate estimates to be made because it applies to specific types and sizes of electrodes.

Scrap Shortage Is Threat to Defense

Industry believes ceiling prevents larger supply —Plates most difficult to obtain. Civilian buying continues to grow less

MARKET IN TABLOID ★

Demand

Nondefense buying slackens.

Prices

Some evasions of scrap ceiling.

Production

Declined ½ point to 96 per cent.

■ GRAVE results are feared by the steel industry as a result of the scarcity of scrap, which is becoming more threatening each week. Such supplies as were obtained prior to Sept. 2, when ceiling prices were resumed, have been consumed and efforts to obtain further adequate supply while adhering to announced maximum prices have been unsuccessful.

While some foundries are evading the regulation in order to obtain material for continued operation, practically all steel mills are observing the schedule. Washington apparently believes the industry is not sincere in its complaint of restricted supplies because of prices being set too low. Some trade leaders take the position that the only reason some mills were not forced to shut down some time ago was that they had paid over the scale and thus obtained material to continue production. They believe strict compliance with the ruling will result in mill shutdowns. While some allocations may be made by the government this will not enlarge the supply but simply cause a change in distribution.

Steel buying in general has declined markedly, in some instances as much as 30 per cent in recent days. Some users with orders on mill books far ahead see no need for further purchases, especially as deliveries are slow. Those without orders on books find little likelihood of delivery without priority. More and more nondefense manufacturers are obtaining defense work and with priority rating are in better position.

Plates are the heaviest burden on mills and even the highest ratings can command no better than three months from most mills and a month longer is required for the next highest priority. Occasionally a small lot may be placed for slightly better delivery. Plate shipments for shipbuilding are keeping up with needs. With new shipways being laid down need for plates will increase in coming months.

Refusal by OPM to give preference to some 180,000 tons of plates for a pipe line from Texas to New York relieves mills of a tremendous burden. The refusal is based on need for plates for shipbuilding and other mere pressing defense work. Proposal to use seamless tubing for the line is left open for further consideration.

Abuse of high blanket priorities granted to some industries is said to be more widely practiced by some subcontractors to obtain material in excess of requirements of their defense work.

Curtailment of automobile production in December to 51.6 per cent of 396,823 units made last December will hold output to 204,848 cars. This will release considerable steel for other uses. However, the automotive industry in producing trucks, tanks and airplanes will require fully as much steel as in the past, probably more. Taking into consideration the 26.5 per cent reduction for the first four months of the model year, the average cut will be 32.2 per cent for the first five months.

Automobile output last week was 60,560 units, 7395 greater than 53,165 the preceding week. This compares with 78,820 cars in the corresponding week last year.

Recent action by OPM on pig iron and warehouse steel has tended to bring a more orderly procedure and in large measure the industry believes conditions have been bettered. Such irregularities as remain probably will be lessened in succeeding months. Pig iron quotas were found satisfactory to most melters and in cases where requests for revision have been made relief has been granted. Larger warehouse allowance is expected to relieve mills of numerous small orders which constituted a nuisance by increasing roll changes.

Lake Superior iron ore consumption in August set a new alltime record at 6,534,424 gross tons and for the year to Sept. 1 another record at 49,712,949 tons. Ore at furnaces and docks Sept. 1 totaled 36,468,769 tons, compared with 32,934,665 tons a year ago.

Operations declined ½-point to 96 per cent last week. Detroit advanced 1 point to 95 per cent and Cleveland 2½ points to 94½. Pittsburgh declined 1 point to 98, Chicago 1 point to 100, Cincinnati 1 point to 88 and Wheeling 8 points to 86. Remaining rates were unchanged: Birmingham 95, St. Louis 98, Eastern Pennsylvania 95, Buffalo 90½, New England 90 and Youngstown 98.

Composites, under fixed prices, are unchanged: Finished steel, $56.60; iron and steel, $38.15; steelworks scrap, $19.16.

COMPOSITE MARKET AVERAGES

	Sept. 20	Sept. 13	Sept. 6	One Month Ago Aug., 1941	Three Months Ago June, 1941	One Year Ago Sept., 1940	Five Years Ago Sept., 1936
Iron and Steel	$38.15	$38.15	$38.15	$38.15	$38.15	$37.93	$34.15
Finished Steel	56.60	56.60	56.60	56.60	56.60	56.60	53.10
Steelworks Scrap..	19.16	19.16	19.16	19.16	19.16	20.05	16.18

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. 20, 1941	Aug. 1941	June 1941	Sept. 1940
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv. Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅝-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	Sept. 20, 1941	Aug. 1941	June 1941	Sept. 1940
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$24.34
Basic, Valley	23.50	23.50	23.50	22.50
Basic, eastern, del. Philadelphia	25.34	25.34	25.34	24.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	23.69
No. 2 foundry, Chicago	24.00	24.00	24.00	23.00
Southern No. 2, Birmingham	20.38	20.38	20.38	19.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	23.06
No. 2X, del. Phila. (differ. av.)	26.215	26.215	26.215	25.215
Malleable, Valley	24.00	24.00	24.00	23.00
Malleable, Chicago	24.00	24.00	24.00	23.00
Lake Sup., charcoal, del. Chicago	31.34	31.34	31.34	30.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	23.17
Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$20.15
Heavy melt. steel, No. 2, E. Pa.	17.75	17.75	17.75	19.70
Heavy melting steel, Chicago	18.75	18.75	18.75	19.30
Rails for rolling, Chicago	22.25	22.25	22.25	21.35
No. 1 Cast, Chicago	20.00	21.50	21.50	16.85

Coke

Connellsville, furnace, ovens	$6.25	$6.25	$6.25	$4.75
Connellsville, foundry, ovens	7.25	7.25	7.25	5.75
Chicago, by-product fdry., del.	12.25	12.25	12.25	11.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheets, Strip

Hot-Rolled Sheets

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 2.10c
Granite City base 2.20c
Detroit, del. 2.20c
Pacific ports 2.65c

Cold-Rolled Sheets

Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, B'ham., base .. 3.05c
Granite City, base..... 3.15c
Detroit, del. 3.15c
Other Mich. pts., del. ... 2.25c
Pacific ports 3.70c

Galvanized Sheets, No. 24

Pittsburgh, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c
Granite City, base..... 3.60c
Pacific ports 4.05c

Corrugated Galv. Sheets

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, 29 gage, per square 3.31c
Granite City 3.38c
Pacific Ports 3.73c

Culvert Sheets

Pittsburgh, Gary, Birmingham, 16-gage, not corrugated, copper steel 3.60c, copper iron 3.90c, pure iron 3.95c.
Pittsburgh, 24-gage, zinc-coated, hot-dipped, heat-treated 4.25c.
Granite City, copper steel 3.70c, copper iron 4.00c, pure iron 4.05c.
Pacific ports, copper steel 4.25c, copper iron 4.55c, pure iron 4.60c.

Enameling Sheets

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage, base 2.75c
Granite City, base 2.85c
Pacific ports 3.40c
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c
Granite City, base..... 3.45c
Pacific ports 4.00c

Electrical Sheets, No. 24

	Pittsburgh Base	Pacific Ports	Granite City	Base Deliv. Mahoning Valley Points
Field gr.	3.20c	3.95c	3.30c	3.275c
Armat.	3.55c	4.30c	3.65c	3.625c
Elect.	4.05c	4.80c	4.15c	4.125c
Motor	4.95c	5.70c	5.05c	5.025c
Dynamo	5.65c	6.40c	5.75c	5.725c
Transformer				
72 ...	6.15c	6.90c	.....	6.225c
65 ...	7.15c	7.90c	.....	7.225c
58 ...	7.65c	8.40c	.....	7.725c
52 ...	8.45c	9.20c	.....	.....

Hot-Rolled Strip

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c
Detroit, del. 2.20c
Other Mich. pts. del. ... 2.25c
Pacific ports 2.75c

Cold-Rolled Strip

Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less..... 2.80c
Chicago, base 2.90c
Worcester, base 3.00c
Detroit, del. 2.90c
Other Mich. pts. del. ... 2.95c

Commodity C.R. Strip

Pittsburgh, Cleveland, Youngstown, base 3 tons and over..... 2.95c
Worcester, base 3.35c
Detroit, del. 3.05c
Other Mich. pts. del. ... 3.10c

Cold-Finished Spring Steel

Pittsburgh, Cleveland, base; add 20 cents for Worcester.
.26-.50 Carbon 2.80c
.51-.75 Carbon 4.30c
.76-1.00 Carbon 6.15c
Over 1.00 Carbon 8.35c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

TYPE	BARS	PLATES	SHEETS	H. R. STRIP	C. R. STRIP
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
304-20% clad	.....	*18.00	19.00	.....	.....
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
316	40.00	44.00	48.00	40.00	48.00
317	50.00	54.00	58.00	50.00	58.00
347	33.00	38.00	45.00	33.00	42.00
403	21.50	24.50	29.50	21.25	27.00
410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
430F	19.50	22.50	29.50	18.75	24.50
431	19.00	22.00	29.00	17.50	22.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00

*Includes annealing and pickling.

Tin, Terne Plate

Tin Plate

Pittsburgh, Chicago, Gary, 100-lb. base box..... $5.00
Granite City $5.10

Tin Mill Black Plate

Pittsburgh, Chicago, Gary, base 29 gage and lighter 3.05c
Granite City 3.15c
Pacific ports, boxed..... 4.05c

Long Ternes

Pittsburgh, Chicago, Gary, No. 24 unassorted 3.80c
Pacific Ports 4.55c

Spl. Coated Mfg. Ternes

Pittsburgh, Chicago, Gary, 100-base box..... $4.30
Granite City $4.40

Roofing Ternes

Pittsburgh base per package 112 sheets 20 x 28 in., coating I.C.

8-lb....	$12.00	25-lb....	$16.00
15-lb....	14.00	30-lb....	17.25
20-lb....	15.00	40-lb....	19.50

Steel Plate

Pittsburgh, Chicago, Gary, Cleveland, Birmingham,

Youngstown 2.10c
Coatesville, Sparrows Point, Claymont....2.10-2.35c
Gulf ports 2.45c
Pacific Coast ports 2.65c

Steel Floor Plates

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

Structural Shapes

Pittsburgh, Bethlehem, Chicago, Buffalo, Birmingham 2.10c
St. Louis, del. 2.34c
Pacific Coast ports 2.75c

Bars

Hot-Rolled Carbon Bars

Pittsburgh, Chicago, Gary, Cleve., Birm., base 20 tons one size 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Duluth, base 2.25c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Rail Steel Bars

Pitts., Chicago, Gary, Cleveland, Birm., base 5 tons 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Hot-Rolled Alloy Bars

Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size 2.70c
Detroit 2.80c

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

4100 .15-25 Mo. 0.55
4600 0.20-0.30 Mo.; 1.50-2.00 Ni. 1.20
5100 80-1.10 Cr. 0.45
5100 Spr. flats 0.15
6100 Bars 1.20
6100 Spr. flats 0.85
Carb., Van. 0.85
9200 Spr. flats 0.15
9200 Spr. rounds, squares 0.40
T 1300, Mn, mean 1.51-2.00 0.10
Do., carbon under 0.20 max. 0.35

Cold-Finished Carbon Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs. 2.65c
Detroit 2.70c

Cold-Finished Alloy Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 3.35c
Detroit 3.45c
Galveston, add $0.25; Pacific Coast, $0.50.

Turned, Ground Shafting

Pitts., Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c
Detroit 2.70c

Reinforcing Bars *(New Billet)*

Pitts., Chicago, Gary, Cleveland, Birm., Sparrows Point, Buffalo, Youngstown, base 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Reinforcing Bars *(Rail Steel)*

Pitts., Chicago, Gary, Cleveland, Birm., base. 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Iron Bars

Philadelphia, com. del. 3.06-3.50c
Pittsburgh, muck bar ... 5.00c
Pittsburgh, staybolt 8.00c
Terre Haute com., f.o.b. mill 2.15c

Wire Products

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

Standard and cement coated wire nails $2.55

(Per Pound)

Polished fence staples .. 2.55c
Annealed fence wire 3.05c
Galv. fence wire 3.40c
Woven wire fencing (base C. L. column) 67
Single loop bale ties, (base C. L. column) .. 59
Galv. barbed wire, 80-rod spools, base column .. 70
Twisted barbless wire, column 70

To Manufacturing Trade

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

Bright bess., basic wire. 2.60c
Galvanized wire 2.60c
Spring wire 3.20c
Worcester, Mass., 10c higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh, keg. $3.85

Alloy Plates (Hot)

Pitts., Chicago, Coatesville, Pa. 3.50c

Rails, Fastenings

(Gross Tons)

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

Cents per pound

Angle bars, billet, mills. 2.70c
Do., axle steel 2.35c
Spikes, R. R. base 3.00c
Track bolts, base 4.75c
Do., heat treated 5.00c
Car axles forged, Pitts., Chicago, Birmingham.. 3.15c
Tie plates, base 2.15c

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

Bolts and Nuts

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

Carriage and Machine

½ x 6 and smaller.....65½ off
Do., 5/16 and ⅝ x 6-in. and shorter .....63½ off
Do., ¾ to 1 x 6-in. and shorter .....61 off
1⅛ and larger, all lengths 59 off
All diameters, over 6-in. long .....59 off
Tire bolts .....50 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts .....56 off
Plow bolts .....65 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less.	62	64
9/16-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger..	56	

Hexagon Cap Screws

Upset 1-in., smaller .....60 off

Square Head Set Screws

Upset, 1-in., smaller ....68 off
Headless, ¼-in., larger ..55 off
No. 10, smaller .....60 off

Piling

Pitts., Chgo., Buffalo .. 2.40c

Rivets, Washers

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

Structural 3.75c
7/16-inch and under .....65-5 off
Wrough washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. .....$4.00 off

Tool Steels

Pittsburgh, Bethlehem, Syracuse, base, cents per lb.

Carb. Reg. 14.00 Oil-hardening .. 24.00
Carb. Ext. 18.00
Carb. Spec. 22.00 High car.-chr. 43.00

High Speed Tool Steels

Tung.	Chr.	Van.	Moly.	
18.00	4	1	...	67.00
18.00	4	2	1	77.00
18.00	4	3	1	87.00
1.50	4	1	8.50	54.00
....	4	2	8	54.00
5.50	4	1.50	4	57.50
5.50	4.50	4	4.50	70.00

Boiler Tubes

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

Lap Welded

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

Seamless

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

Welded Iron, Steel, Pipe

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

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	51
¾	66½	55
1—3	68½	57½

Iron

¾	30	10
1—1¼	34	16
1½	38	18½
2	37½	18

Lap Weld

Steel

2	61	49½
2½—3	64	52½
3½—6	66	54½
7 and 8	65	52½

Iron

2	30½	12
2½—3½	31½	14½
4	33½	18
4½—8	32½	17
9—12	28½	12

Line Pipe, Plain Ends

Steel

1 to 3, butt weld 71½
2, lap weld 64
2½ to 3, lap weld 67
3½ to 6, lap weld 69
7 and 8, lap weld 68
Seamless, 3 pts. lower discount.

Cast Iron Pipe

Class B Pipe—Per Net Ton

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

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

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

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

Forging Quality Billets

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

Sheet Bars

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

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 5/32-inch incl. (per 100 lbs.) $2.00
Do., over 5/32 to 47/64-in. incl. 2.15

Worcester up $0.10, Galveston up $0.25 and Pacific Coast up $0.50 on water shipments.

Skelp

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

Shell Steel

Pittsburgh, Chicago, base, 1000 tons of one size, open hearth

3-12-inch $52.00
12-18-inch 54.00
18-inch and over 56.00

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur... $6.00- 6.25
Connellsville, fdry.. 7.00- 7.50
Connell. prem. fdry. 7.25- 7.60
New River fdry. .. 8.00- 8.25
Wise county fdry. .. 7.50
Wise county fur. .. 6.50

By-Product Foundry

Newark, N. J., del... 12.60-13.05
Chicago, outside del. 11.50
Chicago, delivered .. 12.25
Terre Haute, del. .. 11.75
Milwaukee, ovens... 12.25
New England, del. .. 13.75
St. Louis, del. 12.25
Birmingham, ovens. 8.50
Indianapolis, del. .. 12.00
Cincinnati, del. 11.75
Cleveland, del. 12.30
Buffalo, del. 12.50
Detroit, del. 12.25
Philadelphia, del. .. 12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol.... 14.00c
Toluol, two degree 27.00c
Solvent naphtha 26.00c
Industrial xylol 26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.) 14.25c
Do. (1000 lbs. or over) 13.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers 7.00c

Per ton, bulk, f.o.b. port

Sulphate of ammonia $30.00

Pig Iron

No. 2 foundry is 1.75-2.25 sil.; 50c diff. for each 0.25 sil. above 2.25 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birmingham, Ala.§	20.38	.....	19.38	25.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.00	25.50	24.50	26.00
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00

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

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham†	25.61	.....	25.11	.....
Boston from Birmingham†	25.12	.....	.....	.....
Boston from Everett, Mass.	25.50	26.00	25.00	26.50
Boston from Buffalo	25.50	26.00	25.00	26.50
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O. from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.61	.....
Cincinnati from Birmingham†	24.06	.....	23.06	.....
Cleveland from Birmingham†	24.12	.....	23.12	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	.....
Milwaukee from Chicago	25.10	25.10	24.60	25.60
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	.....	.....
Newark, N. J., from Birmingham†	26.15	.....	.....	.....
Newark, N. J., from Bethlehem.	26.53	27.03	.....	.....
Philadelphia from Birmingham†.	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....

Pittsburgh dist.: Add to Neville Island base, North and South Sides, 69c; McKees Rocks, 55c; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, 84c; Monessen, Monongahela City, $1.07; Oakmont, Verona, $1.11; Brackenridge, $1.24.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Saginaw, Mich., from Detroit	26.31	26.31	25.81	26.81
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.50	.....	23.62	.....
St. Paul from Duluth	26.63	26.63	.....	27.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50, base; $30.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$28.00
Pitts. dist. fur.	23.50	do., del. Chicago	31.34
		Lyles, Tenn., high phos.	28.50

Silvery

Jackson county, O., base, 6.00 to 6.50 per cent $29.50. Add 50 cents for each additional 0.25 per cent of silicon. Buffalo base $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

Manganese differentials in silvery iron and ferrosilicon not to exceed 50 cents per 0.50 per cent manganese in excess of 1 per cent.

Refractories

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

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	38.00
New Jersey	49.00

Ohio

First quality	43.00
Intermediate	36.10
Second quality	36.00

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$31.00
Wire cut	29.00

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, duty pd., tide. net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$23.00
Do., barge	23.00
No. 2 lump	23.00

Ferroalloy Prices

Ferromanganese, 78-82%, Carlots, duty paid, sbd. $120.00; Carlots, del. Pitts. 125.33; Carlots, f.o.b. Southern furn. 145.00; For ton lots add $10, for less-than-ton lots $13.50, for less than 200-lb. lots $18.

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 36.00

Ferrosilicon, 50%, freight allowed, c.l. 74.50; Do., ton lot 87.00; Do., 75 per cent 135.00; Do., ton lots 151.00; Spot, $5 a ton higher.

Silicomanganese, c.l., 2½ per cent carbon 118.00; 1½% carbon 128.00; Contract ton price $12.50 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.90-2.00

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 11.00c; Do., ton lots 11.75c; Do., less-ton lots 12.00c; less than 200 lb. lots. 12.25c

67-72% low carbon:

	Carloads	Ton lots	Less ton
2% carb.	17.50c	18.25c	18.75c
1% carb.	18.50c	19.25c	19.75c
0.10% carb.	20.50c	21.25c	21.75c
0.20% carb.	19.50c	20.25c	20.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Molybdenum Oxide, lb. Molyb. cont., 5-20-lb. containers, f. o. b., Washington, Pa., and Langeloth, Pa., lb. 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots 1.23; Do., less-ton lots 1.25; 20-25% carbon, 0.10 max., ton lots, lb. 1.35; Do., less-ton lots 1.40

Spot 5c higher

Ferrocolumbium, 50-60% contract, lb. con. col., f.o.b. Niagara Falls 2.25; Do., less-ton lots 2.30

Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton. $142.50; Do., spot 145.00; Do., contract, ton lots 145.00; Do., spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50; Do., spot 160.00; Do., contract, ton lots. 160.00; Do., spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c; Do., ton lots 8.00c; Do., less-ton lots 8.50c

Spot ½c lb. higher

Chromium Briquets, contract, freight allowed, lb. carlots, bulk 7.00c; Do., ton lots 7.50c; Do., less-ton lots 7.75c; Do., less 200 lbs. 8.00c

Spot ¼c lb. higher

Tungsten Metal Powder, 98-99 per cent, per lb., depending upon quantity $2.50-2.60

Vanadium Pentoxide, contract, lb. contained $1.10; Do., spot 1.15

Chromium Metal, 98% cr., contract, lb. con. chrome, ton lots 80.00c; Do., spot 85.00c; 88% chrome, cont. tons. 79.00c; Do., spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.50c; Do., 2% 13.00c

Spot ¼c higher

Silicon Briquets, contract carloads, bulk, freight allowed, ton $74.50; Ton lots 84.50; Less-ton lots, lb. 4.00c; Less 200 lb. lots, lb. 4.25c

Spot ¼-cent higher

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.50c; Ton lots 6.00c; Less-ton lots 6.25c

Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton 102.50; Do., ton 108.00

35-40%, contract, carloads, lb., alloy 14.00c; Do., ton lots 15.00c; Do., less-ton lots 16.00c

Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60; Do., 100-200 lb. lots 2.75; Do., under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

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

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: S.A.E. 2300	Cold Drawn Bars: S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.48	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	5.26	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	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.00	4.92	3.47	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.30	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.85	5.25	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	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	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.75	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.49	4.49	6.09	4.19	....	5.79	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	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.	3.75	5.95	5.95	4.10	4.10	5.50	4.20	....	5.25	....	7.15	....	....
Seattle	4.00	4.00	5.20	4.75	4.75	6.50	4.75	7.25	6.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	5.00	....	5.75	....	....
Los Angeles	4.15	5.45	7.25	4.95	4.95	7.20	5.10	7.30	6.30	....	6.60	11.35	10.35
San Francisco	4.00	5.20	6.80	4.70	4.70	6.40	4.70	7.20	6.45	....	7.05	11.60	10.60

	S.A.E. Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.65	....	8.75	8.60	9.40
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	6.05	10.60	9.60	9.45	10.10

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300 pounds and over, Portland, Seattle; 400-14,999 Twin Cities; 400-3999 Birmingham; 400 pounds and over in Memphis; Los Angeles, bars over 4-in. wide, 1-in. thick, 4.95c.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 1 to 10 bun. in Los Angeles; 300 and over in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; any quantity in Philadelphia; 750-4999 in San Francisco.

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, 1 to 99 pounds in Los Angeles; 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.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b U.K. Ports	£	s	d
Merchant bars, 3-inch and over	$66.50	16	10	0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20	0	0
Structural shapes	2.79c	15	10	0
Ship plates	2.90c	16	2	6
Boiler plates	3.17c	17	12	6
Sheets, black, 24 gage	4.00c	22	5	0
Sheets, galvanized, corrugated, 24 gage	4.61c	25	12	6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1	10	9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

		£	s	d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$25.79	6	8	0(a)
Basic pig iron	24.28	6	0	6(a)
Furnace coke, f.o.t. ovens	7.40	1	16	9
Billets, basic soft, 100-ton lots and over	49.37	12	5	0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14	10	6
Merchant bars, rounds and squares, under 3-inch	3.17c	17	12	0††
Shapes	2.77c	15	8	0††
Ship plates	2.91c	16	3	0††
Boiler plates	3.06c	17	0	6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22	15	0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26	2	6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23	15	0
Bands and strips, hot-rolled	3.30c	18	7	0

(a) del. Middlesbrough 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	10.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Chinese wolframite, net ton, duty pd.	$24.00-25.00
Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c

F.O.B. Rio Janeiro.

Scheelite, imp.	23.50-24.00
Chrome ore, Indian, 48% gross ton	.....

Manganese Ore

Including war risk but not duty, cents per unit cargo lots.

Caucasian, 50-52%	.....
So. African, 48%	70.00-72.00
Brazilian, 46%	69.00-71.00
Chilean, 47%	65.00-70.00
Cuban, 50-51%, duty free	.....

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

OTHER THAN RAILROAD GRADES (a) (b)	Pittsburgh, *Wheeling *Johnstown, Weirton, Steubenville	Youngstown, *Warren, Canton, Sharon	Chicago	Kokomo, Ind.	Bethlehem	*East. Pa.	Sparrows Pt.	Cleveland	Buffalo	*Cincinnati Ashland, Ky. Portsmouth, O. Middletown, O.	St. Louis	Detroit	Duluth	Birmingham	Alabama City, Atlanta	*Pacific Coast	Minnequa, Colo.
No. 1 heavy melting	$20.00	$20.00	$18.75	$18.25	$18.25	$18.75	$18.75	$19.50	$19.25	$19.50	$17.50	$17.85	$18.00	$17.00	$17.00(d)	$14.50	$16.50
No. 1 hyd. comp. black sheets	20.00	20.00	18.75	18.25	18.25	18.75	18.75	19.50	19.25	19.50	17.50	17.85	18.00	17.00	17.00(d)	14.50	16.50
No. 2 heavy melting	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	16.50	16.85	17.00	16.00	16.00(d)	13.50	15.50
Dealer No. 1 bundles	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	16.50	16.85	17.00	16.00	16.00(d)	13.50	15.50
Dealer No. 2 bundles	18.00	18.00	16.75	16.25	16.25	16.75	16.75	17.50	17.25	17.50	15.50	15.85	16.00	15.00	15.00(d)	12.50	14.50
Mixed borings and turnings	15.25	15.25	14.00	14.25	13.50	14.00	14.00	14.75	14.50	14.75	12.75	13.10	.....	12.25	12.25	9.75	11.75
Machine shop turnings	15.50	15.50	14.25	14.50	13.75	14.25	14.25	15.00	14.75	15.00	13.00	13.35	15.50	15.00	15.00	10.00	12.00
Shovel turnings	16.50	16.50	15.25	15.50	14.75	15.25	15.25	16.00	15.75	16.00	14.00	14.35	16.50	16.00	16.00	11.00	13.00
No. 1 busheling	19.50	19.50	18.25	17.75	17.75	18.25	18.25	19.00	18.75	19.00	17.00	17.35	17.50	16.50	16.50	14.00	16.00
No. 2 busheling	15.50	15.50	14.25	13.75	13.75	14.25	14.25	15.00	14.75	15.00	13.00	13.35	13.50	12.50	12.50	10.00	12.00
Cast iron borings	15.75	15.75	14.50	14.00	14.00	14.50	14.50	15.25	15.00	†15.25	13.25	13.60	13.75	12.75	12.75	10.25	12.25
Uncut structurals and plate	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	18.50	16.85	17.00	16.00	16.00	13.50	15.50
No. 1 cupola	21.00	21.00	20.00	20.00	22.50	23.00	22.00	22.00	20.00	21.00	20.00	20.35	19.00	20.00	.....	18.00	.....
Heavy breakable cast	19.50	19.50	18.50	18.50	21.00	21.50	21.00	20.50	18.50	19.50	18.50	18.85	17.50	18.50	.....	17.00	.....
Stove plate	19.00	.....	17.00	16.00	18.00	18.50	18.00	18.00	19.00	17.50	17.00	14.10	16.00	17.00	.....	14.00	.....
Low phos. billet, bloom crops	25.00	25.00	23.75	23.75	23.25	23.75	23.75	24.50	24.25	23.50	22.50	22.85	23.00	22.00	.....	19.50	.....
Low phos. bar crops and smaller	23.00	23.00	21.75	21.75	21.25	21.75	21.75	22.50	22.25	21.50	20.50	20.85	21.00	20.00	.....	19.50	.....
Low phos. punch., plate scrap**	23.00(c)	23.00	21.75	21.75	21.25	21.75	21.75	22.50	22.25	21.50	20.50	20.85	21.00	20.00	.....	17.50	.....
Machinery cast cupola size***	22.00	22.00	21.00	21.00	23.50	24.00	23.50	23.00	21.00	22.00	21.00	21.35	20.00	21.00	.....	19.00	.....
No. 1 machine cast, drop broken, 150 pounds and under	22.50	22.50	21.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50	21.85	20.50	21.50	.....	19.50	.....
Clean auto cast	22.50	22.50	21.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50	21.85	20.50	21.50	.....	19.50	.....
Punchings and plate scrap††	22.00(c)	22.00	20.75	20.75	20.25	20.75	20.75	21.50	21.25	20.50	19.50	19.85	20.00	19.00	.....	16.50	.....
Punchings and plate scrap§§	21.00(c)	21.00	19.75	19.75	19.25	19.75	19.75	20.50	20.25	19.50	18.50	18.85	19.00	18.00	.....	15.50	.....
Heavy axle and forge turnings	19.50(c)	19.50	18.25	18.25	17.75	18.25	18.25	19.00	18.75	18.00	17.00	17.35	17.50	16.50	.....	14.00	.....
Medium heavy elec. furnace turnings	18.00(c)	18.00	16.75	16.75	16.25	16.75	16.75	17.50	17.25	16.50	15.50	15.85	16.00	15.00	.....	12.50	.....
GRADES ORIGINATING FROM RAILROADS															Kansas City		
No. 1 R.R. heavy melting steel	21.00	21.00	19.75	19.25	.....	19.75	19.75	20.50	20.25	20.50	18.50	18.85	19.00	18.00	17.00	15.50	.....
Scrap rails	22.00	22.00	20.75	20.25	.....	20.75	20.75	21.50	21.25	21.50	19.50	19.85	20.00	19.00	18.00	16.50	.....
††Rerolling quality rails	23.50	23.50	22.25	21.75	.....	22.25	22.25	23.00	22.75	23.00	21.00	21.35	21.50	20.50	19.50	18.00	.....
Scrap rails 3 feet and under	24.00	24.00	22.75	22.25	.....	22.75	22.75	23.50	23.25	23.50	21.50	21.85	22.00	21.00	20.00	18.50	.....
Scrap rails 2 feet and under	24.25	24.25	23.00	22.50	.....	23.00	23.00	23.75	23.50	23.75	21.75	22.10	22.25	21.25	20.25	18.75	.....
Scrap rails 18 inches and under	24.50	24.50	23.25	22.75	.....	23.25	23.25	24.00	23.75	24.00	22.00	22.35	22.50	21.50	20.50	19.00	.....

*Johnstown, Pa., Warren, O., and Cincinnati, O., not bases for railroad grades; Wheeling railroad only. Eastern Pa. includes Coatesville, Claymont, Conshohocken, Phoenixville and Harrisburg as bases only for "other than railroad grades"; Philadelphia and Wilmington are bases only for railroad grades. Pacific Coast bases are Los Angeles, San Francisco, Seattle, Portland. †Base price at Portsmouth; Middletown 25 cents less and Ashland, Ky; ††The term 'rails for rerolling' includes any rails which are sold to be used for rerolling, irrespective of whether or not such rails are usable for re-laying. **⅜-inch and heavier, cut 12 inches and under; ***may include clean agricultural cast; ‡‡under ⅜-inch to ¼-inch, cut 12 inches and under; §§under ¼-inch to No. 12 gage, cut 12 inches and under. (c) add $1.75 at Pittsburgh. (d) Bases at Atlanta only.

OTHER BASE PRICES: Machine shop turnings $17.60, Alloy, W. Va., $13.35 Toledo, O.; **Shoveling turnings,** $14.35 Toledo; **cast iron borings,** $13.60 Toledo; **No. 1 cupola cast,** $19 Minneapolis and St. Paul, $20.50 Chattanooga, $21 Radford, Va. and $22 Phillipsdale, Bridgeport and Worcester; **Heavy breakable cast,** $20.50 Phillipsdale, Bridgeport and Worcester, $17.50 Minneapolis and St. Paul; **Stove plate** $16 Minneapolis and St. Paul, $17.50 Chattanooga, $18 Radford, Va., $15.60 Toledo and $17.50 Phillipsdale, Bridgeport and Worcester; **Machinery cast cupola size** $21.50 Chattanooga, $22 Radford, Va. and $23 Phillipsdale, Bridgeport and Worcester; **No. 1 machinery cast, drop broken** $22 Chattanooga, $22.50 Radford, Va. and $23.50 Phillipsdale, Bridgeport and Worcester; **Clean auto cast** $22 Chattanooga, $22.50 Radford, Va. and $23.50 Phillipsdale, Bridgeport and Worcester.

(a) The grades specified are, except dealers' No. 1 and No. 2 bundles and uncut structural and plate scrap, as named and defined in the simplified recommendations R-58-36 of the Department of Commerce which shall be the governing specifications for iron and steel scrap hereunder (other than railroad grades). Dealers' No. 1 bundles shall consist of new, clean black sheet scrap, hydraulically compressed in the dealer's yard. Dealers' No. 2 bundles shall consist of old fender and body scrap, and shall in no case command a premium. (b) These grades (other than railroad grades) represent the major classifications of iron and steel scrap. The maximum prices of superior or inferior grades shall continue to bear the same comparable relationship to those major grade classifications as heretofore existed between the prices of such superior or inferior grades and the prices of the major grades.

Maximum price at shipping point: A shipping point is the point from which the scrap is to be shipped to a consumer. Maximum price at which a grade of scrap may be sold f.o.b. its point of shipment is the shipping point of such scrap. **For shipping points located within a basing point,** the shipping point price is determined by taking the basing point price and deducting actual transportation costs to the consumer's plant within the basing point. **For shipping points outside a basing point,** the shipping point price is determined by taking the nearest basing point and subtracting the lowest transportation charge. (Example: No. 1 steel shipped from Toledo takes the Detroit base of $17.85 minus transportation of $1.52 or $16.33. This shipping point price is the same to all consumers wherever located.) **Exceptions:** Shipping point of any grade not listed as having a basing point in New England is the Johnstown base minus the all-rail freight from the shipping point to Johnstown. Shipping point prices for New York City, Brooklyn, New York and New Jersey must be computed on the basis of the Bethlehem base although nearer to Buffalo in terms of barge transportation.

Maximum prices to consumers: Maximum price at which any grade (other than railroad) may be delivered to a consumer wherever located is the shipping point price plus actual transportation charges. Where shipment is by water, not more than 75 cents per gross ton may be included for handling charges at dock. Maximum delivered price in no case shall exceed by $1 a ton the nearest maximum base price in terms of transportation charges. (Example: The $1 excess is the so-called "springboard" arrangement. Youngstown consumers can draw on the Cleveland area for No. 1 steel scrap by taking the Cleveland base of $19.50, subtracting the Cleveland switching charge of 65 cents and adding freight to Youngstown of $2.08. The resulting delivered figure of $20.93 is within the "springboard" limit of $1 over the Youngstown base of $20.)

Billet and bloom crops originating in the Pittsburgh district may be sold within or without the district at the Pittsburgh base price plus up to, but not more than $2.50 in transportation charges. Maximum prices for **unprepared scrap** shall be $2.50 a ton less than the maximums for corresponding grade or grades of prepared scrap. **Remote scrap** is material located beyond the zone from which the railroad freight rate to Pittsburgh is $11.20 and a consumer may obtain permission from OPACS to absorb transportation charges necessary to obtain 500 tons or more.

Railroad grades: Where a railroad operates in two or more basing points, the highest base applies to consumers anywhere on the line. (Example: New York Central Railroad uses the $21 Pittsburgh base on No. 1 steel since the P. & L. E. operates there). Exception: Switching charges of 84 cents a ton must be subtracted from prices on scrap originating from railroads operating in Chicago and sold for consumption outside Chicago. Where railroad scrap is shipped to an off-the-line consumer, the highest maximum on-the-line price or the nearest basing point price, whichever is higher, applies.

Commissions: Brokers are allowed a commission up to 50 cents a ton above maximum prices to consumers, including export.

Export prices: Maximum on No. 1 heavy melting steel (other than railroad) is the domestic shipping point price plus lowest transportation charge to point of export. Maximum price to a domestic consumer on line of the originating railroad plus transportation to point of export applies on No. 1 railroad steel. Customary differentials apply on other railroad and non-railroad grades.

Sheets, Strip

Sheet & Strip Prices, Page 90

Some slackening in sheet and strip production is noted because of smaller supplies of semifinished. This results from diversion of raw steel to heavier products, which are in greater demand, and to large exports of semifinished to Great Britain. Purely commercial consumers are buying less and in some cases increase of defense work has not made up the difference. Civilian users placed heavy orders early in the summer, although deliveries were not promised. Placing further orders under the circumstances appears futile. Meanwhile many are obtaining defense work and with priorities they are in improved position.

Sheet sellers are being confronted by increasing requests from buyers with defense work, who are not regular customers, at the suggestion of OPM. In some instances they feel compelled to take the business but in others they suggest trying a mill in their own district. When forced to accept such orders the price is figured on the basing point nearest the mill, the consumer absorbing the freight. For regular customers the basing point nearest the consumer is used, as a rule.

Lack of uniformity prevails among producers of deep drawing quality enameling sheets in the matter of extras for thickness. This is attributed to the practice before prices were frozen, some producers publishing no extras. Chief sufferers from this condition are said to be small hand mills which had dropped extras from their cards. These now find costs are higher and have no means to increase their prices.

On A-1-A priorities hot-rolled sheet deliveries are being offered in six to nine weeks. In cases of special allocation by OPM to meet a special situation delivery can be made earlier. Occasionally a buyer catches an early rolling of his specification and obtains a better position. An instance of special allocation for railroad car works was issued this month to provide car builders with material to meet the month's schedule.

Cold strip buying has subsided, demand and pressure for deliveries being less insistent. New orders for defense are relatively high in the aggregate, but pending classification of backlogs civilian bookings have slackened. With analysis of bookings 70 to 75 per cent complete by most of rerollers, strictly defense requirements covered by priority ratings are somewhat less than expected, although considerable tonnage is on the border line. Apparent excess buying is also limited, most undelivered volume being scheduled for early fabrication. There are some exceptions and numerous consumers have expanded production above normal, but buying for inventory had been discouraged and arbitrarily curtailed by most producers for some months previous to the official orders covering this factor.

New York state will reduce its

1942 license plates to ¾ the present size and 1943 plates to half the present size. The state normally uses 2000 tons of sheets for this purpose. Next year's reduction will save 500 tons and 1943 plates will require only an additional 500 tons.

Plates

Plate Prices, Page 90

Plates are probably the most difficult form of steel to obtain promptly, even under high priority. Some important producers find they can do no better than three months on current orders with A-1-A ratings and three to four weeks longer on A-1-B. Even this is subject to setback by such special allocations as OPM may make from time to time. Occasionally a producer may be found who can do slightly better.

Fabricators of water and large oil tanks and gasoline containers have been confining production to priority work and little civilian work is being accepted. Municipalities have been active during recent years, while federal funds were available, and most pressing needs have been cared for and under present circumstances little chance exists for placing their needs.

Complaints continue to be heard that shipbuilders and some other plate consumers are getting more material than is needed for current use and are building inventory at a time when others are in need. This is denied by shipyard officials, who point out that new shipways are being laid down and use of plates will increase as they come into production. At any rate, deliveries for ship work have kept up with requirements.

Some oil companies are holding back construction of storage units except those on which priority has been given. A gas utility in the East, which placed a tank in May, has just obtained a release on the required plates.

Fabricators without high ratings for individual projects see little hope of obtaining material for the remainder of the year in sufficient volume to maintain shop operations and warehouse stocks promise only partial relief for small users.

Considerable activity has been shown in the steel barge market in the Pittsburgh district. Recent orders include ten cargo barges for Weirton Steel Co. and one deck-type barge for Lone Star Cement Corp.

PLATE CONTRACTS PLACED

175 tons, 500,000-gallon elevated water tank, navy yard, Charleston, S. C., to R. D. Cole Mfg. Co., Newnan, Ga., $63,200; bids Sept. 5, spec. 10557.

PLATE CONTRACTS PENDING

4000 tons, largely plates, five navy tugs to be built by Cramp Shipbuilding Co., Philadelphia.

785 tons, chromium-molybdenum steel plates, Rock Island, Ill., arsenal, cir. 717; bids Sept. 25.

100 tons or more, 400 storage tanks, with top deck, 250-barrel capacity each, Quartermaster, Marine Corps, delivery Philadelphia.

100 tons or more, 115 tanks, 5000-gallon gasoline underground storage: 40 units, delivered Charleston, S. C., Hilyard Co., Norristown, Pa., low; 50 to Mare Island, Calif., Independent Iron Works, Oakland, Calif., low, and 25, New York, Hilyard Co., Norristown, Pa., low.

Unstated, 9910 feet water mains, for Tacoma, Wash., alternates for concrete pipe; bids soon; $230,000 appropriated.

Bars

Bar Prices, Page 91

Deliveries on carbon steel bars vary considerably even on tonnages carrying the same priority rating. A consumer recently obtained shipment on an A-1-A rating in three weeks, catching an early rolling of his specification by one of his suppliers. On the other hand, some tonnages of similar rating require eight weeks or more.

Some cancellations have been received by mills, usually tonnages placed in duplicate with other mills and rendered useless under provisions of the priority regulation.

Larger fabricators using bars, particularly alloy and forging quality, have heavy defense orders with mills, deliveries extending beyond first quarter. Abuse of priority ratings is said to be appearing, the A-1-A rating to machine tool builders having filtered down to subcontractors whose requirements are far-fetched under this top rating. As an illustration, a

utility furnishing gas to a machine tool builder obtained a carload of steel pipe on the strength of a small fuel line extension in the shop. This is claimed to have occurred in numerous instances, the machine tool priority covering many purchases remote from the original purpose.

Some relief for less essential users of bars, who have depended on warehouses for miscellaneous requirements is expected to result from the priority given the latter. Inability to fill these requirements over the past few months has been the cause of much disturbance of production. This will also tend to relieve mills from the burden of many small orders which, graded as to priority, has upset rolling and finishing schedules.

In New England small arms manufacture and shipbuilding are accountable for a heavy tonnage, all at top priority, and Massachusetts arsenals are taking a large bar tonnage. Watertown, Mass., arsenal is closing on 10,500 tons additional low carbon bars for remelting, shipments specified through and beyond first quarter.

With only three producers quoting on the full tonnage, Youngstown Sheet & Tube Co., Youngstown, O., has been awarded 610 tons of round steel bars for delivery at the Boston navy yard at $56,805.40.

Pipe

Pipe Prices, Page 91

Merchant pipe buying is in a seasonal increase, construction work and repairs being pushed before winter weather sets in. Merchant and line pipe sales this month have been larger than in August. Black pipe is most easily obtained, shipments being possible in two to three weeks, sometimes from mill stocks. In some cases black pipe production has been hampered by lack of skelp.

Galvanized pipe is difficult to obtain, stocks are broken as to sizes and replacements are more difficult than for black or wrought iron. Cast iron pipe production is dependent on pig iron supply but has been sufficient to meet defense needs. Municipal buying has slackened, due to uncertain deliveries. Most pipe foundries have insufficient stocks to meet a heavy load.

Resellers are making out form PD-83A, showing first quarter deliveries, though there was considerable delay in receipt of the forms. Because of this situation the deadline of Sept. 15 was extended several days.

CAST PIPE PLACED

1550 tons, 20-inch with fittings, Panama, sch. 5402, to United States Pipe & Foundry Co., Burlington, N. J.

180 tons, 6 and 8 inch, district No. 4, Yakima, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

CAST PIPE PENDING

286 tons, 3806 feet 20-inch centrifugal, East Marginal Way improvement, Seattle; bids to board of public works, Sept. 25.

200 tons, cast iron soil pipe and fittings, Panama, sch. 5452, Alabama Pipe Co., Anniston, Ala., low.

125 tons, 6, 8 and 10-inch, cement-lined, Panama, sch. 5553, bids Oct. 6.

STEEL PIPE PLACED

475 tons, 48-inch steel pipe for city of Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

STEEL PIPE PENDING

750 tons, 350 tons, 54-inch, navy yard, Portsmouth, N. H.; 300 tons, 24-inch, Metropolitan Water Commission, Boston.

Wire

Wire Prices, Page 91

Priorities on manufacturers' wire are reducing merchant wire output, including fence, nails and barbed wire, and supplies in warehouse are almost the only source for buyers under current conditions.

Limitation is not on production equipment but on wire rods, the proportion for merchant production being steadily reduced by heavy demand for manufacturers' wire carrying priority. No wire product can be shipped now without the proper form and rating being submitted and at the moment any rating below A-3 has small chance of early delivery. Warehouses, accustomed to carry considerable inventory, have seen stocks drop rapidly

and their own priority of A-9 does not allow replenishing of stock.

Wiremakers are scheduling production to assure the largest output, grouping orders to avoid as many shifts as possible in sizes and analysis. This is not strictly according to priority rating in some cases, but the overall result is better and output is larger.

In spite of these efforts manufacturers of wire products find difficulty in obtaining sufficient material to keep up with demands for their products, though few serious interruptions have occurred.

Some departments are sold solid well into first quarter, notably rope and cable mills. Considerable spring wire volume is without preferential rating, substantial portions of furniture spring material being included in this category. Limited supplies of wire rods and continued rescheduling of finishing operations according to priorities is extending delivery on many orders.

Rails, Cars

Track Material Prices, Page 91

Buying of rolling stock by railroads is light, the only pending lot of size being 1625 freight cars for the Chicago & North Western for which court permission has been granted pending Interstate Commerce Commission permission for financing.

Carbuilders are unable to operate at full capacity because of difficulty in obtaining sufficient steel, mainly plates, though structural shapes are also slow in delivery. Recently granted priority has aided somewhat but heavy demand for shipbuilding and other direct defense requirements prevent sufficient being diverted for cars. Car shops have heavy backlogs, sufficient for several months operation at the best rate possible to attain.

CAR ORDERS PLACED

Atchison, Topeka & Santa Fe, 200 caboose cars; to own shops at Topeka, Kans.

Bethlehem Steel Co., 100 gondolas; to shops at Johnstown, Pa.

New York, New Haven & Hartford, ten 90-ton transfer cars; to shops at Readville, Mass.

CAR ORDERS PENDING

Chicago & North Western, 1375 steel sheathed, 50-ton box cars and 250 seventy-ton ore cars; court permission granted.

National Railroads of Mexico, 150 fifty-ton gondolas, 150 forty-ton stock cars and 120 all-steel light-weight passenger cars; bids asked.

Navy, delivery San Diego, Calif., three flats and one box, Haffner-Thrall Car Co., Chicago, low, sch. 8428, yards and docks.

Norfolk & Western, 25 seventy-ton covered hopper cars; pending.

LOCOMOTIVES PLACED

National Railroads of Mexico, two 44-ton diesel-electric locomotives; to General Electric Co., Schenectady, N. Y.

LOCOMOTIVES PENDING

Navy, one diesel locomotive for delivery to Cherry Point, N. C.; bids Sept. 23.

Navy, one diesel-electric locomotive for delivery to Oakland, Calif.; bids Sept. 30.

RAIL ORDERS PENDING

St. Louis Southwestern, 8600 tons 112-pound rails; court permission asked.

BUSES BOOKED

Twin Coach Co., Kent, O.; Forty-seven 40-passenger for New York City Transit System, Brooklyn, N. Y.; fourteen 44-passenger for Surface Transportation Corp., New York; seven 32-passenger for New York State Railways, Utica, N. Y.; three 35-passenger for Reading Stret Railway Co., Reading, Pa.; one 30-passenger for Bremerton-Charleston Transportation Co., Bremerton, Wash.

Structural Shapes

Structural Shape Prices, Page 91

The supply of plain shapes is less tight. Some mills can offer six to eight weeks on A-1-A priorities and lower priorities can be handled more expediously than a few weeks ago. Some mills can make shipment on non-defense work in 12 to 14 weeks. Lessened volume of fabricated shape business in recent weeks accounts for the easier situation.

Fabricators say that priority ratings are coming through faster and routine is being speeded up as all involved become better acquainted with proper procedure. At present there is little commercial busi-

ness, but a large proportion may now materialize.

Fabricators expect that when defense work slackens definitely considerable railroad work and highway bridges will take up the slack. Awards for the past week were over 40,000 tons, the best in several weeks.

SHAPE CONTRACTS PLACED

12,000 tons, air depot, Macon, Ga., for war department, to Bethlehem Steel Co., Bethlehem, Pa.

11,000 tons, seaplane plant for Boeing Aircraft Co., Renton, Wash., (suburb of Seattle) to Pacific Car & Foundry Co., Seattle; Austin Co., contractor.

3000 tons, hangars, aviation mechanics' school, Wichita Falls, Tex., to Mosher Steel Co., Dallas; hangar door assemblies to Capitol Steel & Iron Co., Oklahoma City, Okla.

2190 tons, connections between State and Dearborn street subways and Chicago Rapid Transit lines, Chicago, for city, to American Bridge Co., Pittsburgh; bids Aug. 28.

1525 tons, airplane motor testing building, Buffalo division, Chevrolet Motor, Tonawanda, N. Y. to Bethlehem Steel Co., Buffalo, through Albert Kahn, contractor.

1400 tons, optical shop, Frankford arsenal, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.

1400 tons, replacement pier, No. 3, naval operating base, Norfolk, Va., to Bethlehem Steel Co., Bethlehem, Pa., through McClean Contracting Co., Baltimore.

1200 tons, bridge requirements, various locations, Chicago, Rock Island & Pacific railroad, to American Bridge Co., Pittsburgh; bids Sept. 8.

750 tons, building, Bridgeport Brass Co., Bridgeport, Conn. to Belmont Iron Works, Philadelphia, through Stone & Webster, Boston.

750 tons, seaplane hangar, marine corps air base, Neuse river, N. C., to Bethlehem Steel Co., Bethlehem, Pa., through T. A. Loving & Co. Associates, Goldsboro, N. C.; bars to Maryland Steel Products Co., Baltimore.

650 tons, pier 82, Pennsylvania railroad, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

650 tons, six buildings, Seneca general depot, New York, to Wisconsin Bridge & Iron Co., through Poirier & McClane Corp., New York.

516 tons, state highway bridge, No. 2204, Marion county, Indiana, to Central States Bridge Co., B. E. Curry Building Co., contractors.

500 tons, compressor house and furnace units, Hercules Powder Co., Louisiana, Mo., to Worden-Allen Co., Milwaukee.

406 tons, Hamilton county, Ohio, bridge, to Bethlehem Steel Co., Bethlehem, Pa.; Visintine & Son, Columbus, contractors.

400 tons, tail tower and anchorages, Wolk creek, Desda, Ky., for government, to American Bridge Co., Pittsburgh.

375 tons, state bridge RC-41-40, Sherburne, N. Y., to American Bridge Co., Pittsburgh.

375 tons, roof framing, Parker power plant, Bureau of Reclamation, Denver, to American Bridge Co., Pittsburgh, spec. 1540-D.

360 tons, grade crossing elimination, Norwich, N. Y. to American Bridge Company, Pittsburgh.

350 tons, building, Fort Hancock, N. J., to American Bridge Co., Pittsburgh.

350 tons, technical service building, Cleveland airport, to Ingalls Iron Works, Birmingham.

315 tons, highway bridge, Bradford County, Pennsylvania, to Phoenix Bridge Company, Phoenixville, Pa.

190 tons, two state highway bridges, Pierre, S. Dak., to Bethlehem Steel Co., Bethlehem, Pa.; Bonesteel & Hyde, Watertown, S. Dak., contractors; bids Aug. 26.

165 tons, bridge, New York, New Haven & Hartford railroad, Blackhall, Conn., to American Bridge Co., Pittsburgh.

140 tons, Elyria Foundry Co., Elyria, O., to Mooney Iron Works Co., Cleveland.

135 tons, chapel-theater building, Great Lakes naval training station, Great Lakes, Ill., for navy, to New City Iron Works, Chicago; Henry Ericsson Co., Chicago, contractor.

130 tons, crane runway beams, South Portland Shipbuilding Co., Portland, Me., to American Bridge Co., Pittsburgh.

110 tons, building, cell-room, Niagara Alkali Co., Niagara Falls, N. Y. to R. S. McMannus Steel Construction Co., Buffalo.

Unstated tonnage, steel towers, Pulpit Rock, Rye, N. H., inv. 29, U. S. engineer, Boston, to Waghorne-Browne Co.,

SHAPE AWARDS COMPARED

	Tons
Week ended Sept. 20	41,332
Week ended Sept. 13.	8,772
Week ended Sept. 6	12,046
This week, 1940	81,811
Weekly average, 1941	28,077
Weekly average, 1940	21,326
Weekly average, Aug., 1941	15,793
Total to date, 1940	926,408
Total to date, 1941	1,094,999

Includes awards of 100 tons or more.

Boston, through Bethlehem Fabricators Inc.; bids Sept. 8.

SHAPE CONTRACTS PENDING

40,000 tons, cast iron tunnel rings, Battery-Brooklyn tunnel, New York; Mason & Hanger Corp., New York, contractors; also about 600,000 large bolts and nuts.

11,000 tons, aircraft engine plant, Jacobs Aircraft Engine Co., Pottstown, Pa.

3500 tons, plant, Bell Aircraft Co., Niagara Falls, N. Y.; readvertised because only one bidder previously.

2500 tons, central heating plant, Washington, for government.

2500 tons, glass plant, building "D," Westinghouse Electric & Mfg. Co., Fairmont, W. Va.

2000 tons, draw bridge, Philadelphia navy yard; Phoenix Bridge Co., Phoenixville, Pa., low, but exceeding appropriation.

1600 tons, runway for overhead cranes, dry dock 5, Philadelphia, for navy.

1500 tons, H-beams, navy yard, Brooklyn, N. Y.

1500 tons, bridge, Hackensack river, New Jersey; bids next month to Central Railroad of New Jersey.

1400 tons, building on pier 3, Norfolk, Va., for navy.

800 tons, railroad bridge, Youngstown Sheet & Tube Co., Struthers, O.

440 tons, municipal auditorium, Des Moines, Iowa.

310 tons, various bridges, Illinois and Iowa, Chicago Great Western railway.

300 tons, Glen-Hazel project, Pittsburgh, Pittsburgh Housing authority.

300 tons, building, Home for the Aged, Our Lady of the Angels, Williamsville, N. Y.

260 tons, drum gate, Salinas river project,Santa Margarita, Calif., for army.

245 tons, building, B. P. Barrett Inc., Albany, N. Y.

225 tons, rubber plant, Defense Plant Corp., Naugatuck, Conn.

225 tons, power plant, Lynn Gas & Electric Co., Lynn, Mass.

225 tons, towers and girder end supports, construction trestle, Appalachia project, Tennessee Valley authority.

180 tons, material storage racks building 77, Brooklyn, N. Y., for navy.

150 tons, building, Exolon Company, Blasdell, N. Y.

140 tons, Chapel theatre building, Great Lakes, Ill., for navy..

140 tons, building addition, Lock Haven, Pa., Piper Aircraft Co.

130 tons, state bridge, Androscoggin river, Errol, N. H.

115 tons, mortuary building, Queens General hospital, New York, for city.

104 tons, bridge, Nazinscot river, Turner, Me.; bids Oct. 1, Augusta.

100 tons, storehouse, naval hospital, Philadelphia; bids Sept. 24.

Unstated, plant extension, Aviation Manufacturing Co., Williamsport, Pa.

Unstated, sports arena flying field, Rantoul, Ill., air corps; bids asked.

Unstated, army hangar, Yakutat, Alaska, air base; award recommended to Michael Flynn Mfg. Co., Philadelphia.

Unstated, towers and appurtenances, Bonneville-Vancouver transmission line No. 6; bids to Bonneville project, Portland, Oreg., Sept. 23; No. 2237.

Unstated, trash racks, gates, stop logs, etc. for Bonneville powerhouse; bids to U. S. engineer, Portland, Oct. 10; No. 698-42-150.

Reinforcing Bars

Reinforcing Bar Prices, Page 91

Total tonnage of reinforcing bar awards in recent weeks has been running heavier than for fabricated shapes. This is due in large measure to the fact that steel is saved by concrete construction. A live inquiry is 22,000 tons of bars for a war department building at Arlington, Va. Were this structure built of shapes 60,000 tons would be required.

Bar deliveries are more extended than on shapes, largely because of congestion of mills by commercial bar tonnage. Much government construction these days, such as military bases, lend themselves to reinforcing bar construction.

REINFORCING STEEL AWARDS

4500 tons, replacement pier, No. 3, naval operating base, Norfolk, Va., to Carnegie-Illinois Steel Corp., through McClean Contracting Co., Baltimore.

4000 tons, warehouse superstructure, Philadelphia navy yard, to Bethlehem Steel Co., Bethlehem, Pa., through Turner Construction Co., New York.

3000 tons, Missouri ordnance depot, Louisiana, Mo., to Laclede Steel Co., St. Louis; Bechtel, McCone & Parsons, contractors.

3000 tons, Missouri ordnance depot, Louisiana, to Laclede Steel Co., St. Louis; Bechtel, McCone & Parsons, contractor.

1000 tons, Boeing seaplane plant, Renton, Wash., to Northwest Steel Rolling Mills, Seattle; Austin Co. contractor.

600 tons, Camp Barling cantonment, Little Rock, Ark., to Ceco Steel Products Co., Kansas City, Mo.; Farnell Blair, contractor.

500 tons, U. S. engineer's depot, Boston, to Joseph T. Ryerson & Son Inc., Chicago.

500 tons, constructing quartermaster, armory, Springfield, Mass., to Concrete Steel Co.

480 tons, defense products plant, Lester, Pa., Westinghouse Electric & Mfg. Co., to Bethlehem Steel Co., Bethlehem, Pa.; United Engineers & Constructors, contractor.

400 tons, overpass, state project, Salem, Mass., to Northern Steel Co., Medford, Mass.; V. Barletta Co., Roslindale, Mass., contractor, $446,124.80.

400 tons, expansion, Allegheny Ludlum Steel Co., Dunkirk, N. Y., to Republic Steel Corp., Cleveland; through Patterson-Leitch.

350 tons, plant, Linde Air Products Co., Kittaning, Pa., to Bethlehem Steel Co., Bethlehem, Pa.; James Stewart & Co., contractors.

322 tons, U. S. engineer, New York, work at Sandy Hook, N. J. to Concrete Steel Co.

300 tons, optical shop, Frankford arsenal, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, plant, American Can Co., St. Louis, to Joseph T. Ryerson & Son

CONCRETE BARS COMPARED

	Tons
Week ended Sept. 20	21,105
Week ended Sept. 13	40,640
Week ended Sept. 6	25,085
This week, 1940	9,897
Weekly average, 1941	13,650
Weekly average, 1940	8,814
Weekly average, Aug., 1941	14,732
Total to date, 1940	347,268
Total to date, 1941	532,350

Includes awards of 100 tons or more.

Inc., Chicago; Norris Construction Co., Chicago, contractor.

250 tons, two test houses, Pratt & Whitney Aircraft Co., East Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., contractor.

233 tons, expanded steel mesh, U. S. engineer, New York, to U. S. Gypsum Co., Chicago; sch. 47, at 4.084 cents per pound.

200 tons, dial exchange building, Illinois Bell Telephone Co., Rockford, Ill., to Ceco Steel Products Co., Chicago.

180 tons, building, Transparent Package Co., Chicago, to Joseph T. Ryerson & Son Inc.; E. W. Sproul Construction Co., contractor.

150 tons, tunnels, Wisconsin-Michigan Power Co., Sagola, Mich., to Bethlehem Steel Co., Bethlehem, Pa.; Bacco Co., contractor.

120 tons, expansion, Thilnany Pulp & Paper Co., Kaukauna, Wis., to Worden-Allen Co., Milwaukee.

120 tons, Liberty bridge improvements, Pittsburgh, to Electric Welding Co., Detroit.

100 tons, Stephen Elliott Kramer school, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; Ross Engineering Co., Washington, contractor.

100 tons, Navy yard garage and fire station, South Boston, to Bethlehem Steel Co., Bethlehem, Pa.; William A. Bailey Co., contractor.

REINFORCING STEEL PENDING

50,000 tons, for 100 concrete barges, taking minimum of 500 tons each.

22,500 tons, for $35,000,000 office building, War Department, Columbia avenue, Arlington, Va.; John McShain Inc., Philadelphia and Doyle & Russell and Wise Construction Co., both of Richmond, Va., joint contractors on cost plus basis.

2500 tons, Federal office building, Suitland, Md.; McCloskey Co., contractor.

1400 tons, superstructure, grade separation, Queens, N. Y.; Grafano Construction Co., contractor.

1000 tons, harbor fortifications, Boston.

800 tons, Brighton dam, Maryland.

640 tons, four buildings, Rath Packing Co., Waterloo, Iowa; bids Sept. 30.

380 tons, Soloman Creek pump station, Wilkes Barre, Pa.

380 tons, substructure, grade separation, Queens, N. Y.; Raymond Concrete Pile Co., contractor.

340 tons, Pontiac service and parts building, Pontiac, Mich.

322 tons, war department, inv. 1097-42-62, New York; bids Sept. 16.

240 tons, housing project, Quincy, Ill., for government; T. S. Willis, Janesville, Wis., contractor; bids Sept. 5; project originally bid May 22 and awarded, later deferred.

200 tons, dormitory, Purdue University, Lafayette, Ind.

200 tons, viaduct, Armstrong county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Sept. 26.

179 tons, hospital for insane, Manitowoc, Wis., Honzinger Construction Co., Milwaukee, low; bids Sept. 6.

175 tons, Navy purchasing officer, New York; bids Sept. 19, sch. 9714.

160 tons, U. S. Department of Agriculture, Carbondale, Ill.

145 tons, drum storage building, Gulf Oil Corp., Staten Island, N. Y.; also 50 tons shapes.

140 tons, building, Southern Illinois State Teachers College, Carbondale, Ill.

140 tons, repairs, Brokaw dam, Brokaw, Wis.

140 tons, reinforcing trusses, Panama, sch. 5438, Bethlehem Steel Export Co., New York, low.

135 tons, highway projects, Rhode Island; bids Sept. 24, Providence.

130 tons, Annette Island, Alaska, airport; bids in to U. S. engineer, Seattle.

103 tons, high school White Fish Bay, Wis.; bids Sept. 10.

100 tons, government arsenal, Watertown, Mass.

Unstated, two 80-foot state bridges, Lemhi county, Idaho; bids to Boise, Sept. 19.

Unstated, sports area flying field, Rantoul, Ill., air corps; bids asked.

Pig Iron

Pig Iron Prices, Page 92

While allocation of September pig iron output by OPM has been well received in general some difficulties have been experienced, which may be eliminated in the October allottment. Some delay has been met in supplying foundries with special analyses in time to avert interruption in operation. Some dissatisfaction has resulted from orders to supply iron users far out of the district served by a furnace, absorption of freight being considered a burden by producers. A ruling will be sought placing the burden of transportation on the consumer.

Scrap shortage has tended to emphasize scarcity of pig iron. Some consumers normally using a high percentage of scrap are now using a larger proportion of pig iron, obtaining approval by OPM. The squeeze in pig iron, particularly basic, in the East, is being reflected in ferromanganese. Increasing pressure for this alloy has caused at least one consumer there to pay $145 f.o.b. Rockdale, Tenn., plus freight. Were it not for heavy pig iron requirements, it is said, some furnace capacity would be diverted to ferromanganese. This may develop later should the alloy situation become acute.

October requisitions generally follow those requested for September, with a few exceptions.

Some allocations refused for September are reappearing and part may be granted where inventories have been reduced.

The New England furnace schedule includes an unexpected volume for delivery outside that area, with less favorable freight involved. In the past the furnace has taken on some business in these districts, which in OPM eyes may have been a factor in allocating part of this tonnage for outside shipment.

For the first time since 1932 pig iron is being produced in the St. Louis district, one furnace of the old Granite City Pig Iron Co. going into blast Sept. 15. The second stack is being rehabilitated and will be blown in soon. The first stack is expected to produce 700 tons per day, about half to be furnished as hot metal to Granite City Steel Co., the remainder to be sold in pigs to other melters in that district. Only basic iron will be produced. Lake Superior ore is being used but plans are under way to provide some Missouri and Arkansas ore.

Inquiry for 445 tons of low phos pig iron for the Brooklyn navy yard brought out only one quotation, $32.42, delivered, by Republic Steel Corp., Cleveland.

Scrap

Scrap Prices, Page 94

Faced by heavy consumer requirements, scrap supplies continue light and relatively little tonnage is moving. While most consumers and brokers are adhering to ceiling prices, rumors continue of higher bids and various evasions. Opinion is growing that October will be a crucial month, reserves by that time being well reduced and collections lessened by approach of bad weather. The belief continues that present prices are too low to bring in large supplies through usual channels.

In many cases the situation is growing acute, with consumption much in excess of scrap receipts. As a rule mills are observing ceiling prices, though faced with probability of curtailed steel production as a result. Whether this stand will be continued remains to be seen. In former instance when the ceiling was broken through, resulting in better flow of scrap, proof was afforded that a higher price will bring out more tonnage. Definite allocations by the government are expected to follow soon, although this action will not increase scrap, but simply change its distribution.

The trade is awaiting announcement from Washington concerning some modifications in price schedules, these being expected momentarily. One important feature is expected to be establishment of a ceiling price on remote scrap at point of origin and provision whereby the consumer will be permitted to pay this price, plus freight, regardless of the price on local scrap.

The situation is obscured somewhat by increasing direct dealing between railroad and industrial producers on the one hand and melters on the other, such tonnage not entering the market. At St. Louis dealers feel aggrieved that much railroad scrap is going direct to consumers instead of being handled through regular channels.

Whether the campaign for wrecking a larger number of automobiles will yield much tonnage remains uncertain. It is believed not much increase will result unless sufficient profit can be made to cause wreckers to enlarge their operations. In some areas it is expected this will yield considerable additional scrap.

In the view of some experienced observers there is a virtual deadlock, all interests sitting back and observing developments. Dealers in the Buffalo district have made a survey which has resulted in showing that supplies moved this year are about 50 per cent larger than last year for the same period. This lends color to the claim that unusual consumption is the cause of the tight situation rather than an actual shortage.

In some sections steel mills are comfortably provided for some time but nearly everywhere foundries find cast grades difficult to obtain in sufficient volume to meet needs.

Some suppliers are said to be holding back in hope of ceiling prices being raised while others are said to have accepted the situation and sold everything they can obtain at prevailing prices.

Warehouse

Warehouse Prices, Page 93

Warehouse demand has eased and is less insistent than in August, largely due to inability of filling orders from depleted stocks. In spite of this warehouses are in receipt of more tonnage than they can handle. Due to delay in forwarding form PD-83A the deadline for filing was extended from Sept. 15 for a "reasonable period" longer, no definite date being set.

While the A-9 priority rating does not solve the difficulty of obtaining stocks, distributors find it is of some help and they will be able to do better for their customers than in recent weeks. The quota arrangement effective Oct. 5 is being studied and while some difficulties are expected the general plan is regarded as a move in the

Tool Steel Scrap

Cents per pound, to consumers f.o.b. shipping point

Tungsten types

For each 1% tungsten contained	
Solid scrap containing over 12%	1.80c
Solid scrap containing 5 to 12%	1.60
Turnings, millings containing over 12%	1.40
Turnings, millings, solids under 5%	1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 0.50 vanadium	13.50
Turnings, millings, same basis	11.50

right direction. It seems probable sufficient material will be available to fill most pressing needs of defense buyers. A large number of small orders, formerly going to mills, is expected to be sent to secondary suppliers, which will relieve mills of considerable difficulty.

Jobbers in second sheets have trouble getting supplies because mills find customers in some cases willing to take seconds instead of firsts. This reduces supply of material to dealers in seconds.

Pacific Coast

Seattle—The steel industry is adjusting itself to priority and other regulations. Plants are at maximum capacity, practically all orders being for defense projects. Larger fabricators are complying with official supggestions to subcontract to small plants, which in turn are working at full speed. Shortage of steel at Washington and Oregon shipyards seems less acute than in California. Stocks of local jobbers have been exhausted but yard inventories have thus far prevented serious delays in operations. While requirements have been met so far, shipyard executives do not minimize the possibilities of the situation but believe they are well protected under priorities regulations.

Boeing Aircraft Co. has received an additional war department contract for $337,447,057 for an unstated number of long range fortress bombers.

Large tonnages of shapes, bars and other items are involved in Alaska air base projects, bids opened almost daily by United States engineer, Seattle. Bonneville power administration has called bids at Portland, Sept. 23, for unstated tonnage of shapes for Bonneville-Vancouver transmission line, while United States engineer, Portland, will open bids Oct. 10 for unstated tonnage involved in trash racks, stop logs and other equipment for Bonneville powerhouse.

Seattle, unable to get satisfactory delivery of plates for a 22-inch water line, has called bids Sept. 25 for 286 tons of 20-inch cast iron centrifugal pipe. Tacoma has appropriated $230,000 for a proposed water supply line, 9910 feet. Bids will be called for welded steel, alternate for concrete pipe. Consumers and dealers are adjusting to new regulations affecting scrap and the market is gradually being stabilized. Receipts are under requirements and are not expected to increase unless the price ceiling is modified. Rolling mills report no immediate concern but foundries find it difficult to obtain sufficient cast iron scrap.

Ferro Price Reaffirmed

Tennessee Products Corp., Nashville, Tenn., has notified the trade it has reaffirmed for fourth quarter its price of $145 per gross ton, f.o.b. furnace, Rockdale or Rockwood, Tenn., for standard ferromanganese, with usual differentials for less than carload quantities.

Tin Plate

Tin Plate Prices, Page 90

Rearrangement of sheet mill output, due to increasing tonnage of plates produced on continuous strip sheet mills, has not caused revisions in tin plate output.

There have been reductions in output of cold mills, but the tonnage has not come off that portion being delivered to tin mills. As a result, tin mill output is unchanged at 94 per cent of capacity, with most mills at or above rated capacity.

Virtually all current tin plate output is going into sanitary cans, as packers are making strong efforts to pack bumper crops in all parts of the country. An unusually large portion is being packed into large cans for the army, as well as for export.

Miscellaneous tin plate users expect better deliveries within the next 30 to 60 days, after the peak in sanitary can business. In a few instances, mills have been able to squeeze in a little more of this business and this will show a gradual increase from now on.

Canada

Toronto, Ont.—Shortage of iron and steel and other essential war materials may result in further curtailment of civilian manufactures in Canada, according to information in government circles. It is stated that any one of the existing controllers can tell a manufacturer he must get along with 50 per cent or less of raw materials used last year to make an additional supply available for war industry. This has special bearing on steel and already strict priority regulation has been put into effect, as well as freezing of stocks in hands of warehouse dealers and some larger consuming plants.

Owing to difficulty in obtaining sheets, plates and other steel materials, Canada now faces a serious shortage of freight and passenger railway cars. Car building companies report it is practically impossible to get enough steel to build cars to fill current orders. Rolling stock builders as well as railroad companies are urging the Ottawa government to give steel for rolling stock construction much higher priority.

Fresh interest in steel plates and sheets is spreading on an ever broadening angle. Priority control is being strictly enforced with the result that only such consumers as are directly associated with the war effort are receiving deliveries.

Orders for merchant bars are piling rapidly and mills now report production to the end of the year fully booked. Bars also come under strict control of the government, with the result that nonwar industry is having trouble placing orders. Small quantity buying is brisk and mills still accept orders for some sizes. Alloy steel output

is less than consumption needs, with persistent heavy demand from many quarters.

While some tapering was noted in structural steel lettings last week, the volume continues well above average for normal times, totaling about 9000 tons.

Pig iron demand is increasing, but no improvement is reported in supply, although merchant melters hope that blowing in of the new furnace at Steel Co. of Canada Ltd., Hamilton, Ont., may result in greater production of foundry and malleable pig iron.

Brisk trading continues in iron and steel scrap with demand exceeding supply. Steel mills and electric furnace operators are fairly well supplied with steel grades, a number of which have been large importers from the United States in recent months, but still are taking all offerings from domestic sources. Supply of cast scrap and stove plate is far under consumers' demand.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 91

With little possibility of the bolt and nut industry obtaining a group rating, some manufacturers are seeking individual ratings, with fair prospect of obtaining A-10. This would at least cover general requirements of ordinary grades on a quarterly basis, the normal and more satisfactory arrangement. Where jobs take special ratings they will be able to obtain better deliveries.

Eastern bolt and nut makers have defense work engaging in some instances more than 60 per cent capacity. The average for the industry, however, is nearer 50 per cent.

Steel in Europe

Foreign Steel Prices, Page 93

London—(*By Cable*)—Demand for steel for war purposes is further intensified in Great Britain. Ordinarily structural steel market is quiet, owing to restrictions on civilian building. Steel output is increasingly diverted to war requirements. Sheet mills are active but domestic tin plate buying is moderate. There is slight activity in export markets. The situation in scrap is growing tighter.

Iron Ore

Iron Ore Prices, Page 93

Another new high record for consumption of Lake Superior iron ore was made in August at 6,534,424 gross tons, against 6,497,442 tons in July, 1941, and 5,700,743 tons in August of last year. Consumption for the year to Sept. 1 at 49,712,949 tons was an all-time record for any similar period, comparing with 38,557,004 tons for the like period of last year.

Total ore at furnaces and on Lake Erie docks Sept. 1 was 36,468,769 tons against 31,597,386 tons a month ago and 32,934,665 tons a year ago. On Lake Erie docks of the United States alone on Sept. 1 were 4,011,601 tons, against 3,340,517 a month ago and 4,226,579 a year ago. United States consumption of Lake iron ore in August was 6,393,215 tons, with Canadian 141,209 tons.

Coke Oven By-Products

Coke By-Product Prices, Page 91

Distribution of coke oven by-products is increasingly linked with defense requirements, toluol and phenol being practically on a mandatory basis with little for civilian industrial requirements. As a result less toluol is going to the lacquer trade, munitions taking an increasing volume, although one defense toluol plant in Texas is getting into production. With another to follow pressure may be eased by the end of the year. The same is true of phenol for plastics, the latter with high ratings getting first call. Naphthalene is limited as to supply, but is not as tight as toluol or phenol.

Oil Price Advances

■ Mid-Continent lubricating oils have advanced in price from ½ to 1 cent a gallon in reflection of a heavy demand and tight stocks. Neutral oils are up ½-cent and bright stocks 1 cent. The Pennsylvania lubricating oil market is firmer with some refiners asking slightly higher than posted prices.

Committee Completes Cast Scrap Schedule

■ The cast scrap committee appointed by the Institute of Scrap Iron and Steel Inc. at the request of OPA to recommend a new schedule and specifications for cast iron grades to supplant the much amended ceiling price schedule now in effect, convened at the Sherman hotel, Chicago, last week.

While details of the committee's effort were not revealed, it is understood that after extended discussions a new schedule and specifications were worked out, approved and transmitted to the institute to be combined with the recommendations of a committee on steel grades and subsequently submitted to OPA. It is also understood that the recommended schedule and specifications represent a distinct improvement over those now in force.

Chicago chapter officers have been re-elected, as follows: William Pohn, Pohn Iron & Metal Co., Chicago, president; H. S. Lewis, Price Iron & Steel Co., Chicago, first vice president; Frank Grossman, Grossman Bros. Co., Milwaukee, second vice president; Rufus A. Heller, W. Heller & Son Inc., Peoria, Ill., third vice president; Henry Rosenthal, Briggs & Turivas, Blue Island, Ill., treasurer; and Ralph Michaels, Hyman-Machaels Co., Chicago, secretary.

The executive committee is comprised of W. J. Ross, Hyman-Michaels Co., Chicago, chairman; Max Schlossberg, M. S. Kaplan Co., Chicago; William Weiss, Midland Steel & Equipment Corp., Chicago; Ralph Kolkmeyer, Luria Bros. & Co. Inc., Chicago; A. J. Clonick, Clonick Steel Co., Chicago; Isador Behr, Joseph Behr & Sons, Rockford, Ill.; Walter Erman, Erman-

Howell & Co. Inc., Chicago; Ernest Krulewitch, Simon Krulewitch Inc., Chicago; John T. McEnroe, John T. McEnroe Co., Chicago; Arthur M. Price, Price-Watson Co., Chicago; Max Patinken, Peoples Iron & Metal Co., Chicago; and Frank Cohen, D. R. & F. A. Cohen, Chicago.

Nonferrous Metals

New York—Shortages of 230,000 short tons of copper in 1941 and of 770,000 tons in 1942 are estimated by the Office of Emergency Management. Estimated supply for 1941 was placed at 1,650,000 tons against estimated demand of 1,880,000 while for 1942 they were, respectively, 1,800,000 and 2,270,000 short tons. Other developments during the week emphasized tightness of most metal markets. SPAB has decided to spur production and curtail consumption for non-essential purposes.

Copper—Metals Reserve Co. likely will pay a substantial increase in the price for Chilean copper while high-cost domestic producers will receive a subsidy. Some consumers have been asked to pay considerably more than 12.50c per pound to dealers who have been given permission to close out certain accounts at prices above the 12-cent maximum.

Lead—OPM is expected to exercise 100 per cent priority over domestic lead compared with the present 35 to 40 per cent control over total supplies which is exercised through its allocation of MRC imports. MRC has taken delivery on 88,871 tons of foreign lead, has 5203 tons afloat, and 151,053 tons on order.

Zinc—OPA officials have had several complaints from consumers that they are being asked 15.00c to 16.00c a pound for zinc. OPA experts are now investigating the situation. While some producers indicated they might advance the price 7½ points, officials in Washington state that there is an informal understanding that producers will not advance the price until after they have discussed the situation with government officials.

Tin—OPA issued an amendment to the tin price schedule, classifying as Grade B pig tin which assays 99.80 per cent pure but contains impurities exceeding the tolerances for grade A tin. A price ceiling of 52.00c a pound for Grade A and a discount of ¾-cent for Grade B tin were established. OPA indicated that it is "not terribly exercised" over the present high Far Eastern tin price which has restricted offerings in the domestic market.

Equipment

New York—Machine tools not included in the ruling effective Aug. 15, by which numerous units were readjusted as to delivery in order of importance, are now subject to similar regulations. Supplemental order covering this group became operative Sept. 15. Machines about ready for shipment or nearing completion are being diverted from original buyers to others considered more important to the defense program with the time element keyed to the general defense sched-

Nonferrous Metal Prices

	Copper									
Sept.	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
2-19	12.00	12.12½	11.75	52.00	52.00	5.85	5.70	7.25	17.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.10
Zinc, 100 lb. base	12.50

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices

No. 1 Composition Red Brass

New York	10.00-10.25
Cleveland	10.00-10.25
Chicago	9.25-9.50
St. Louis	9.50

Heavy Copper and Wire

New York, No. 1	10.00
Cleveland, No. 1	10.00
Chicago, No. 1	10.00
St. Louis	10.00

Composition Brass Turnings

New York	9.25

Light Copper

New York	8.00
Cleveland	8.00
Chicago	8.00
St. Louis	8.00

Light Brass

Cleveland	5.50-5.75
Chicago	5.75-6.00
St. Louis	5.75-6.00

Lead

New York	5.00-5.25
Cleveland	4.75-5.00
Chicago	4.75-5.00
St. Louis	4.50-4.75

Old Zinc

New York	4.50
Cleveland	4.00-4.12½
St. Louis	4.50-5.00

Aluminum

Mls., cast	11.00
Borings, No. 12	9.50
Other than No. 12	10.00
Clips, pure	13.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l. c. l.	13.25
Standard No. 12 aluminum	16.00

ule involving plants about ready for production. As a result some plants are getting equipment ahead of schedule at the expense of others. Meanwhile new placements with builders and dealers continue heavy and aggregate backlogs are maintained or even mounting. Machine tool industry is probably keyed at a higher pitch than most and with new plants and expansions steadily getting into production is meeting demands in a most satisfactory manner. Supplies, including steel, castings, fixtures, parts and motors as a rule are obtainable to meet record-breaking production of shop equipment.

Boston—Buying of machine tool equipment for aircraft construction, including engines, continues heavy. Production at New England machine tool plants is at a record level and mounting, limited only by skilled labor supply, which is not as acute as earlier in the emergency. Materials, parts and fixtures are ample for this high output; only in rare spots are delays noted, which do not materially affect production. While demand for all types of machinery is in excess of production, and small tool makers are pressed to meet requirements, need for screw machines is outstanding.

Seattle—The market is active but limited by priority regulations, overtaxed transportation facilities from eastern centers and slow deliveries. United States engineer has awarded contract for benchboard sections at Bonneville power house to Westinghouse at $45,254. Wetsinghouse is low to Bonneville project at $151,160 for furnishing a 30,000-kva condenser for Midway substation. Caterpillar Tractor Co. is low, $99,189, for furnishing 14 tractors with trailbuilders. United States engineer, Portland, Oreg., has called bids Oct. 9 for 27 disconnecting switches for Bonneville powerhouse.

Construction and Enterprise

Ohio

CLEVELAND—General Hard Chromium Plating Co., 13000 Athens avenue, will use triple present space in new plant at 3130 Berea road, to be occupied Nov. 15. Additional machinery will be installed. Plant is 100 per cent on defense work. James T. Sass is manager.

CLEVELAND—Champion Machine & Forging Co., 3695 East Seventy-eighth street, has let general contract at $693,135 to Sam W. Emerson Co., 1836 Euclid avenue, for a plant addition. (Noted Sept. 15.)

CLEVELAND—Cleveland Cap Screw Co., 2917 East Seventy-ninth street, has let contract to R. E. Nixon Co., 1737 Euclid avenue, for a plant addition. (Noted Sept. 15.)

CLEVELAND—Weatherhead Corp., 300 East 131st street, producer of shell fuze assemblies and aircraft parts, has made lease agreement with Defense Plant Corp. for $1,018,200 for additional machinery and equipment to be installed in present plant.

Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 100 and Reinforcing Bars Pending on page 101 in this issue.

CLEVELAND—Bender Mfg. & Repair Co., 2135 Columbus road, has been formed by Joseph Bender Jr., formerly of Bender Body Co., Elyria, O., and has leased about 14,000 square feet of manufacturing space.

CLEVELAND — Collamer Machine Works, 1620 Collamer road, will build a plant addition 40 x 40 feet.

CLEVELAND—Jack & Heintz Inc., Hanna building, has been given an additional grant of $146,089 by the government for adding to facilities for production of electric airplane starters.

ELYRIA, O.—Buildings and machinery of Bender Body Co., Clark street, will be sold separately at public auction Oct. 7-10, by Gust Rosen, auctioneer, N.B.C. building, Cleveland. Hugh Wells, Leader building, Cleveland, is trustee.

GENEVA, O.—Geneva Metal Wheel Co. is building an addition 27 x 80 feet for sand and pig iron storage and a warehouse addition 60 x 85 feet, increasing floor space 7260 square feet.

MIDDLEFIELD, O.—Vichek Tool Co., 3001 East Eighty-seventh street, Cleveland, Donald B. Wilson, secretary, will build a 45 x 115-foot addition to its plastics plant here, the second enlargement of the plant in two years.

PAINESVILLE, O.—Diamond Alkali Co. will build and operate a magnesium plant with capacity of 36,000,000 pounds annually, to be financed by Defense Plant Corp., Washington.

RAVENNA, O.—Allied Machine & Engineering Corp., Roy Wilt, attorney, N.B.C. building, Cleveland, is seeking location with 50,000 square feet floor space for manufacture of bomb fuzes and lock nuts. Company now is operating in plant of Portage Machine Co., 243 Myrtle avenue, Ravenna, O. Cleveland, Salem and New Philadelphia locations are being considered.

Connecticut

BRIDGEPORT, CONN.—Auto-Ordnance Corp. is planning to build a two-story addition 60 x 80 feet, estimated to cost $50,000.

BRIDGEPORT, CONN. — Bridgeport Brass Co. is building a plant for manufacture of cartridge cases, to cost about $4,275,000, financed by Defense Plant Corp.

Massachusetts

ATTLEBORO, MASS.—American Metal Crafts Co. is building a one-story plant 50 x 270 feet, estimated to cost $70,000, with equipment.

DORCHESTER, MASS.—Meisel Press Mfg. Co., Dorchester avenue, will build a plant unit costing $900,000 to $1,000,000. Cleverdon, Varney & Pike, 46 Cornhill street, Boston, are engineers.

MILFORD, MASS.—Milford Rivet & Machine Co. is building a one-story addition 30 x 110 feet, to cost about $45,000.

SPRINGFIELD, MASS.—Storm Drop Forging Co. is adding to its heat treating department 50 x 100 feet and 32 x 66 feet, to cost about $85,000, with equipment, (Noted July 21).

Rhode Island

PROVIDENCE, R. I.—Nicholson File Co., 23 Acorn street, will build a one-story 50 x 120-foot power plant costing about $50,000. Jenks & Ballou, 2600 Industrial Trust building, are engineers.

Vermont

WINDSOR, VT.—Cone Automatic Machine Co. Inc. will build an addition for machine production, costing about $350,000, with equipment, financed by Defense Plant Corp.

New York

BUFFALO—National Aniline & Chemical Co., South Park avenue, will let contract soon for a further plant addition to cost over $40,000.

NIAGARA FALLS, N. Y.—U. S. Hoffman Co., A. Connett, manager, Lamson street, Syracuse, N. Y., will build a plant addition costing about $250,000.

NIAGARA FALLS, N. Y.—National Carbon Co. Inc., Madison and West 117th streets, Lakewood, O., will build additions 93 x 450 and 134 x 210 feet. Contract has been given Scrufari Construction Co. Inc., 825 Fifteenth street, at about $200,000. H. T. Reed, care owner, is engineer.

New Jersey

NEWARK, N. J.—CO2 Fire Equipment Co., 10 Empire street, will build a one-story 220 x 440-foot manufacturing building. Contract has been given Wigton-Abbott Corp., 1225 South avenue, Plainfield, N. J. Estimated cost is about $400,000.

Pennsylvania

PITTSBURGH—Mine Safety Appliance Co., J. T. Ryan, president, 300 Braddock avenue, has let contract for a six-story manufacturing building and boiler house, estimated to cost $80,000, to Navarro Corp., 6219 Broad street.

PORT ALLEGANY, PA.—Pittsburgh Corning Glass Corp., L. O. Griffith, superintendent, has let a contract for a cellular glass manufacturing plant to H. K. Ferguson Co., Hanna building, Cleveland, at estimated cost of $150,000.

Michigan

CASSOPOLIS, MICH.—Fruit belt electric co-operative, R. Thompson, manager, will install additional generating facilities at cost of about $125,000 with funds allotted by REA.

DETROIT—Plasteel Corp., 1562 Penobscot building, has been incorporated with $50,000 capital to deal in plastic products, by Albert L. Bunting, same address.

DETROIT—Westool Mfg. Co., 3491 Lincoln avenue, has been incorporated with $4000 capital to manufacture tools, dies and jigs, by Harold H. Stilson, 19209 Teppert avenue, Detroit.

DETROIT—Air Craft Machine & Engineering Inc., 439 East Fort street, has been incorporated with $50,000 capital to manufacture parts, tools and fixtures, by John Farrell, same address.

DETROIT—George A. Maher Mfg. Co., 2-244 General Motors building, has been incorporated with $50,000 capital to manufacture metal products, by George A. Maher, same address.

DETROIT—Superior Magnesium Corp., 1026 Lafayette building, Detroit, has been incorporated with $15,000 capital to deal in magnesium, by J. Vernon Pimm, 325 Land Title building, Philadelphia.

ROYAL OAK, MICH.—Oakland county

drainage commission, E. F. Clark, Pontiac, Mich., chairman, is having plans made for a sewage disposal plant to serve five square miles, estimated to cost about $980,000, and has applied for a WPA allottment.

Illinois

CHICAGO—Perfection Tool & Metal Heat Treating Co., 1742 West Hubbard street, has bought a building adjoining its plant, two and three stories, 100 x 108 feet, to expand its facilities for defense work, now about 85 per cent of its total.

DECATUR, ILL.—City plans extension of power plant and installation of additional boiler, stokers and other accessories. Warren & Van Praag, Decatur, are engineers.

Indiana

INDIANA HARBOR, IND. — Inland Steel Co. has given contract to Arthur G. McKee & Co., Cleveland for its sixth blast furnace, with capacity of 1000 tons daily.

SOUTH BEND, IND.—Studebaker Corp. will build a one-story 71 x 172-foot chip and oil house to cost about $55,000. Giffels & Vallet, 1000 Marquette building, Detroit, are engineers.

Maryland

BALTIMORE—American Brake Shoe & Foundry Co., 2001 Laurens street, has rejected bids for a foundry building and will readvertise. Estimated cost is about $350,000. O. D. Conover, 1740 East Twelfth street, Cleveland, is engineer.

BALTIMORE — American Totalisator Co., 5 East Center street, will take bids soon on a one-story 100 x 150-foot plant and warehouse at Twenty-eighth street and Hampden avenue, to cost about $50,000. H. F. Baldwin, 12 East Pleasant street, is architect.

BALTIMORE — American Hammered Piston Ring division of Koppers Co., Burk and Hamburg streets, will build plant for defense production of aircraft engine parts, including several one-story buildings, project to cost $1,250,000, of which about $900,000 will be for machinery and equipment. Defense Plant Corp. will finance.

BALTIMORE—Julien P. Frieze & Sons division of Bendix Aviation Corp. is building a plant 160 x 325 feet for manufacture of aviation and metercological instruments, on Taylor road, near Towson, Md.

Missouri

ST. LOUIS—Busch-Sulzer Bros. Diesel Engine Co., 3300 South Second street, will build a one-story 117 x 200-foot addition to its machine shop, contract to Smith-Cooke Construction Co., 4829 Easton avenue. Ford, Bacon & Davis, New York, are engineers.

ST. LOUIS—Monsanto Chemical Co., 1700 South Second street, is building an additional story to its four-story plant at 8025 Idaho avenue. T. P. Barnett Co., Arcade building is architect.

ST. LOUIS—Carondelet Foundry Co., 2100 South Kingshighway boulevard, is building one-story additions 30 x 60 feet and 25 x 60 feet to its warehouse at 4938 Bischoff avenue.

Wisconsin

MILWAUKEE—A. O. Smith Corp., 3533 West Twenty-seventh street, will let contract soon for one-story additions 300 x 400 and 200 x 600 feet. E. W. Burgess, care owner, is engineer.

MILWAUKEE—Pelton Steel Casting Co., West Dewey place, will build an addition 60 x 134 feet.

Texas

FREEPORT, TEX.—Dow Chemical Co., Midland, Mich., plans third magnesium plant, twice as large as its two other local plants combined, with capacity of 72,000,000 pounds magnesium annually. Plant will be owned by Defense Plant Corp. and operated by Dow Chemical Co.

Iowa

WATERLOO, IOWA—Rath Packing Co. will let contracts soon for a five-story beef-killing building and six-story cold storage building, at cost of about $150,000. Henschen, Everds & Cromble, 59 East Van Buren street, Chicago, are engineers.

Nevada

LAS VEGAS, NEV.—Basic Refractories Inc., Hanna building, Cleveland, will build and operate a magnesium plant near Midway, Nev., costing $63,000,000, financed by Defense Plants Corp. Washington.

California

BELL, CALIF.—Apex Steel Corp., 6111 South Eastern avenue, is adding 10,000 square feet floor space to its foundry.

LOS ANGELES—Fluor Corp., builder of steel tanks, is building an office building addition at 2500 South Atlantic boulevard, 37 x 37 feet, costing $6500.

LOS ANGELES—Don Davidson, 5146 Alhambra avenue, is building a machine shop 50 x 100 feet, costing $7500.

LOS ANGELES—Hard Chrome Engineering Co., 1051 East Slauson avenue, will build a new plant 60 x 97 feet, at 1717 East Slauson avenue, to cost $14,000.

LOS ANGELES—Pacific Steel Products Inc. has been incorporated with $2,500,000 capital by F. E. Neary and associates. Sherman & Sherman, 411 West Fifth street, are representatives.

LOS ANGELES—Parts Engineering & Mfg. Co. has been incorporated with 2500 shares no par value by H. E. and A. M. Montgomery, of Sherman Oaks, Calif. J. E. Dalton, Stock Exchange building, Los Angeles, is representative.

LOS ANGELES—Western Industrial Engineering Co., 2223 East Thirty-seventh street, is building a plant at 3301 Medford street, over 94,000 square feet of floor space, for manufacture of structural steel products, aviation supplies and magnetic testing machinery. A government order for $225,000 worth of the latter has been taken.

LOS ANGELES—Westelectric Castings Inc., 2040 Canfield avenue, is building a 6000-square foot foundry addition for production of iron and steel castings.

LOS ANGELES—National Supply Co., Border avenue and Carson street, Torrance, Calif., has started expansion to cost $2,000,000, enlarging forging and machine shop facilities for production of shafts for large ships and other forgings for the Navy and Maritime Commission. Building will be 150 x 750 feet, equipped with 1500-ton press, cranes, furnaces and other accessories.

LOS ANGELES—Bechtel-McCone-Parsons, 601 West Fifth street, has been given contract to design and construct large ammonia plant for the ordnance department, costing $17,000,000, to be operated by Hercules Powder Co. Location not yet announced.

LYNWOOD, CALIF.—Sammons & Sons are building a machine shop at 10704 Alameda street, costing $2000.

NORTH LONG BEACH, CALIF.—Joshua Hendy Iron Works, San Francisco, is building a branch plant at 2340 Artesia street for manufacture of parts for steam marine engines.

ORANGE, CALIF.—Anaconda Wire & Cable Co., 403 West Maple street, is building a warehouse 74 x 63 feet at cost of $8000.

SAN DIEGO, CALIF.—Consolidated Aircraft Co., 3302 Pacific Highway, is building an addition to its experimental laboratory 200 x 325 feet, costing $130,000.

Oregon

TROUTDALE, OREG.—OPM has recommended construction of aluminum plant here with capacity of 90,000,000 pounds annually. Plant will be government owned and operated by aluminum Co. of America.

Washington

BELLINGHAM, WASH.—Weldit Tank & Steel Co., 1806 Cornwall street, is remodeling and enlarging plant.

BELLINGHAM, WASH.—Regents of Western College of Education will take bids Oct. 2 for first unit of proposed $100,000 addition to boiler plant, including two high-pressure boilers, stokers and other equipment. Lincoln Bouillon, Seattle, is consulting engineer.

MT. VERNON, WASH.—Survey has been completed by the Austin Co., Cleveland, and bids will be called soon on proposed $3,790,000 naval air base on Whidby island.

SEATTLE—Northwest Bolt & Nut Co., 4502 Fourteenth avenue, N. W., is building a 52 x 56-foot plant addition.

SEATTLE—Prefabricated Ships, has been incorporated with $156,000 capital by J. J. Koenig and associates, 1430 Joseph Vance building.

TACOMA, WASH.—Location of an aluminum plant here is considered certain following approval by Defense Plant Corp. Plans call for investment of $3,900,000. Output is planned for 15,000 tons annually. Plant to be operated by Olin Corp., Alton, Ill., subsidiary of Western Cartridge Co.

TACOMA, WASH.—City commission is considering $625,000 appropriation to enlarge power substation, including two 42,000-kva. transformer banks, circuit breakers and other equipment and equipment for one 36,000-kvs transformer bank.

Canada

PETERBOROUGH, ONT. — Outboard Marine & Mfg. Co. of Canada Ltd. Monaghan road, manufacturer of engines and motors, will build plant addition costing $28,000, without equipment, general contract to Bradford & Hoshal, 1170 Yonge street, Toronto, Ont.

TORONTO, ONT.—Coulter Copper & Brass Co. Ltd., 115 Sumach street, manufacturer of bakery and confectionery copper machinery and equipment, has let contract to Holtby Construction Co., 279 Rusholme road, for a plant addition costing $30,000, without equipment.

WELLAND, ONT.—Atlas Steels Ltd., maker of special alloy steels, will build further plant addition at Main street works, costing $500,000, with equipment.

SYDNEY, N. S.—Dominion Steel & Coal Corp. Ltd., will build an addition to cost $60,000, without equipment.

MONTREAL, QUE.—Oxygen Co. of Canada, 2549 St. James street West, is having plans prepared and will ask bids soon for a plant addition costing about $50,000 with equipment. Perry, Luke & Little, 1405 Bishop street, are architects.

MONTREAL, QUE.—Canadian Propellers Ltd., 1010 St. Catharine street West, will build addition costing $350,000, contract to Collet Freres Ltd., 1978 Parthenais square.

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. . . by a great many concerns in the defense industries. If you have surplus machinery in your plant, an advertisement in this section will help you dispose of it quickly. . . . Write STEEL, Penton Building, Cleveland.

Employment Service

SALARIED POSITIONS
$2,500 to $25,000

This thoroughly organized advertising service of 31 years' recognized standing and reputation, carries on preliminary negotiations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been $2,500 or more, send only name and address for details. R. W. Bixby, Inc., 110 Delward Bldg., Buffalo, N. Y.

Castings

OHIO

THE WEST STEEL CASTING CO., Cleveland. Fully equipped for any production problem. Two 1½ ton Elec. Furnaces. Makers of high grade light steel castings. also alloy castings subject to wear or high heat.

PENNSYLVANIA

NORTH WALES MACHINE CO., INC., North Wales. Grey Iron, Nickel, Chrome. Molybdenum Alloys. Semi-steel. Superior quality machine and hand molded sand blast and tumbled.

Opportunities

FOR SALE

Fine Cattle and Sheep Ranch in the West. Fully equipped, fenced and stocked. Price $1,500,000. Box 23, P.O. Box 26, Trinity Station, New York.

FACTORY FOR SALE

Modern daylight one-story building. 30,000 feet Monitor type. Craneways—Stoker—Steam heat—Very nice offices.

ALL IN FIRST CLASS CONDITION

Arthur A. Dawley and Co.
614 Union Commerce Bldg., Cleveland
Phone MAin 8464

FACTORY FOR SALE
IN DETROIT

Suitable for foundry—light or heavy manufacturing. Building 7550 sq. ft. All on one floor with R. R. spur. 20-ft. ceiling. Land area 19,000 sq. ft. with Jefferson Ave. frontage. Available at once. Price $15,000. Terms.

HOWARD J. ELY, Realtor
1557 Union Guardian Bldg., RA 4330
Detroit, Mich.

CLASSIFIED RATES

All classifications other than "Positions Wanted," set solid, minimum 50 words, 5.00, each additional word .10; all capitals, minimum 50 words, 6.50, each additional word .13; all capitals, leaded, minimum 50 words 7.50, each additional word .15. "Positions Wanted," set solid, minimum 25 words 1.25, each additional word .05; all capitals, minimum 25 words 1.75, each additional word .07; all capitals, leaded, minimum 25 words 2.50, each additional word .10. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge.

Displayed classified rates on request.

Address your copy and instructions to STEEL, Penton Bldg., Cleveland.

Positions Wanted

GRADUATE METALLURGICAL ENGIneer with 2½ years' experience in research and production of seamless and welded steel tubing, carbon, alloy and stainless grades, desires position with a mid-western firm. Reply Box 509, STEEL, Penton Bldg., Cleveland.

WANTED—HEATING JOB ON CONTINUous furnace. American, 38 years. Best reference. Address Box 533, STEEL, Penton Bldg., Cleveland.

Auction

Positions Wanted

PURCHASING AGENT AND PROJECT manager, experienced in purchasing, expediting for standard production or construction programs. Acquainted with manufacturers and their products in Industrial sections. Mechanical engineering training with electrical experience. Address Box 559, STEEL, Penton Bldg., Cleveland.

MAINTENANCE OR INDUSTRIAL ENGIneer, technical graduate, age 45. Experienced as steel mill foreman, chief draftsman, research engineer. Can design new equipment to speed production. Ability to organize efficiently. Now employed with small company. Address Box 561, STEEL, Penton Bldg., Cleveland.

SUPERVISOR OF STRUCTURAL STEEL and general plate work fabrication, 15 years' experience, seeking connection with first class organization as shop superintendent or general foreman. Address Box 543, STEEL, Penton Bldg., Cleveland.

SCRAP IRON SUPERINTENDENT, 19 years' experience, wants connection with reliable firm. Address Box 562, STEEL, Penton Bldg., Cleveland.

Auction

TRUSTEE'S SALE IN BANKRUPTCY

Tuesday, Wednesday and Thursday, October 7, 8 and 9 at 10:00 A.M. (E.S.T.)
ELYRIA, OHIO

Pursuant to an order by the Hon. Wm. B. Woods, Referee in Bankruptcy, Cleveland, Ohio, I will offer at Public Auction on Tuesday, Wednesday and Thursday, October 7, 8 and 9 at 10:00 A.M., each day (E.S.T.) the Assets of BENDER BODY CO., Bankrupt, on the premises at Elyria, Ohio.

Sale will include land, 126 acre farm, buildings with a total area of approximately 475,000 square feet, railroad siding, modern, up-to-date, motorized machinery and equipment, good will, trade name, trademarks, patents, patents pending, steel, stainless steel, sheet aluminum, brass, copper, nickel anodes, chrome, scrap iron, automobiles and trucks, inventory, parts, office furniture and equipment.

Court appraisal of assets approximately $1,221,000.00.

The above will be offered in its entirety, in separate units; also in lots to dealers and users.

Circulars will be mailed upon request.

Plant may be inspected each day from 10:00 A.M. to 4:00 P.M.

Hugh Wells, Trustee,
Leader Building, Cleveland, O.

Henry B. Johnson, Atty. for Trustee
Standard Bldg., Cleveland, O.

All inquiries by mail, telegraph or telephone should be made to:

GUS ROSEN, *Auctioneer, Liquidator and Appraiser*
1608-9 N.B.C. Building, Main 1861 Cleveland, Ohio

Opportunities

FOR SALE
FULLY EQUIPPED PLANT

For manufacturing heavy machinery for Rolling Mill and Fabricating plants.

In business *over* 50 *years.*

Manufacturing over 200 different styles and sizes of modern up-to-date machines, for metal working, some machines over 70 tons. Over 100 employed. About $300,000 of good orders on hand now. No debts or mortgages. For full details address Box 558, STEEL, Penton Bldg., Cleveland.

Opportunities

FOR SALE

Beautiful, practically new, daylight one-story plant in Michigan, not far from Detroit. Approximately 150,000 sq. ft.

Now in operation but owner can vacate in 60 days and consolidate operations in other plants. Latest modern oil burning heating plant. Separate switches for incoming and outgoing materials. Plenty of additional land for expansion. Completely fenced in with separate watchman's building.

Address Box 563,
STEEL, Penton Bldg., Cleveland

ADVERTISING INDEX

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

ADVERTISING INDEX

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

"Wait a Minute, Man!

our sales manager will want to see this

Market Selector!"

HERE is the kind of marketing information that top executives are always on the lookout for. Presidents, Vice Presidents and Sales Managers have enthusiastically welcomed the help of the Market Selector in getting a real picture of their marketing opportunity. It has helped Advertising Managers and agency men to win top executive support for their recommendations. You'll find, too, that the Market Selector will save you time in planning next year's program. You'll get a new slant on where your products can be used—and how many worthwhile prospects you have. If you want to see this X-Ray of the Metalworking Market — drop us a line now and ask to see the Market Selector.

. . . . Like a master key **STEEL** magazine opens for you the doors to important contacts in the Metalworking and Metal Producing industries. Through its advertising pages you can *reach* and *keep alive* those important contacts, shut off from your salesmen by defense barriers.

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